Report

Multiple trace element analyses for silicate minerals and glasses by laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS)

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Abstract: Programs were established in the shared research facilities of the Geological Survey of Japan (GSJ-Lab) for trace element analysis of silicate minerals and glasses in microspots using laser ablationinductively coupled plasma-mass spectrometry (LA-ICP-MS). National Institute of Standards and Technology (NIST) synthetic glasses reference materials (NIST 613 and NIST 611) were used as external calibration standards, and suitable instrumental operation settings were set as follows; 0.5 L min⁻¹ He carrier gas flow rate, 100 µm laser spot diameter, 5 Hz repetition rate, and 40 % laser energy (fluence ca. 2.0 J cm⁻²). NIST 615 and NIST 613 were analyzed as unknown samples to evaluate precision and accuracy. Precision was mostly less than 30 % for 45 elements from ⁴⁵Sc to ²³⁸U for laser spot diameters ranging from 100 to 10 µm. Accuracy was evaluated according to the difference (DIF) between the analytical results and reference values in the literature. Accuracy for the analysis of NIST 613 was DIF < 30 %, except for Sc, Mn, Ni, and Ge. For NIST 615, DIF was less than 30 %, except for Tl with laser spot diameters of 20 and 10 µm, and for Cd with a laser spot diameter of 20 µm. The depths of laser pits for generic conditions for the analysis of clinopyroxene, amphiboles and plagioclase were estimated as extents without penetration of the thin section samples. Two suites of analytical programs (34 and 27 elements) were additionally prepared for general purpose petrological and geochemical discussion and the accuracy of both was evaluated. The DIFs for the suite of 34 elements were mostly less than 30 %, although some for Cr, Mn, Ni, and Cs with laser spot diameters $< 40 \,\mu$ m exceeded 30 %. In the suite of 27 elements, the DIFs were < 30 %, except for Sc.

Keywords: Trace elements, Laser Ablation-Inductively Coupled Plasma-Mass Spectrometry (LA-ICP-MS), NIST reference materials

1. Introduction

Since the 1980s, the inductively coupled plasma-mass spectrometry (ICP-MS) technique was actively used as an analytical method for rapid simultaneous multi-element analysis with high sensitivity and a wide dynamic range for analyses of geologic samples (e.g., Houk *et al.*, 1980; Date and Gray, 1985; Hirata *et al.*, 1988; Eggins *et al.*, 1997). Instruments equipped with quadrupole mass filters are the most commonly used in geochemical analyses today. There are two quantitative analytical methods by ICP-MS based on the difference in the introduction of samples, i.e., the solution and laser ablation methods. In

the solution method, geologic samples are firstly decomposed by strong acid(s), diluted with aqueous nitric acid solution by several thousand times, and then introduced to the ICP-MS instrument. The laser ablation method directly introduces an aerosol ablated by a laser to the ICP-MS, and this method enables microspot trace element analysis of samples such as minerals (e.g., Perkins *et al.*, 1993; Fryer *et al.*, 1995; Ludden *et al.*, 1995; Hirata and Kon, 2008, and references therein).

While the solution method is available to perform trace element analysis of minerals by mineral separation from rock samples and subsequent acid digestion, the laser ablation method enables the compositional heterogeneity in a single crystal and

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crystal by crystal within a thin section to be evaluated by local analysis. In addition, the laser ablation method has several advantages such as ease of analysis for acid-resistant minerals, smaller effect of interference elements due to absence of oxide production from dissolution in acid, and negligible errors that are unavoidable in the preparation and dilution of solutions (e.g., Kimura *et al.*, 1996; Satoh *et al.*, 2001).

The stability of a short-term (few milliseconds to seconds) ICP-ion source is generally not good; therefore, a long integration time is required to improve precision for the quadrupole mass filter which scans the target mass range (Kimura *et al.*, 1996). Thus, the precision of the solution method is better than the laser ablation method because samples introduced with the solution method are stable for a longer time than with the laser ablation method. The laser ablation method is possibly accompanied by attenuation of the signal intensity by the formation of craters and/or fluctuation of signal intensity due to unstable sample introduction. These observations suggest that the stable introduction of a homogeneous aerosol into ICP-MS is important to improve the precision of the laser ablation method.

Trace element analysis generally requires careful treatment of samples during preparation and analysis. For the solution method, expertise and technique are required for solution preparation in a clean environment, prevention of contamination until introduction to the ICP-MS, and management of the instrument operating conditions during analysis. In contrast, because laser ablation method directly ablates the solid sample, contamination is less problematic. It is possible to obtain stable data of constant quality without expertise for instrumental operation when the laser ablation settings and instrumental analytical conditions for various multipurpose samples are optimized.

The shared research facilities of the Geological Survey of Japan, National Institute of Advanced Science and Technology (GSJ-Lab, AIST) are used as a cooperative managing analytical laboratory for common basic analyses in geological studies (e.g., Ogasawara, 2013a,b). With such analytical instruments. it is important that simple and clear analytical protocols and hardware systems are established for users with various specialties, and such users should understand the precision, accuracy, and limitations of instruments used. In this study, we report on the analytical program and its precision and accuracy for the measurement of multiple trace element compositions covering the mass range from 45 Sc to 238 U in small spot (100 – 20 μm diameter) on thin (ca. 30 μm) layers of geologic samples using LA-ICP-MS at GSJ-Lab. The method in this study aims to establish the simplest multipurpose analytical program to obtain data of multiple trace element compositions with adequate quality for geologic discussion. Thus, it is assumed that focus on specific geochemical purposes with more precise analytical

programs would be prepared and reported separately.

2. Experimental conditions

We firstly summarize common instrumentation and operating conditions for the various examinations discussed here, and then describe results for examination of the He carrier gas flow rate and laser ablation conditions in later sections.

2.1 Instrument

The LA-ICP-MS system at the GSJ-Lab consists of a New Wave Research NWR213 laser ablation system coupled to an Agilent 7700 x quadrupole ICP-MS. The laser ablation system consists of a Nd:YAG laser that generates an output wavelength of 213 nm and a maximum pulse energy (fluence) of >30 J cm⁻². The diameter of the ablation spot can be varied from 110 to 4 μ m, which is controlled by rotating aperture that strips out part of the beam. The sample chamber is 100 × 100 mm² and 30 mm deep, and is equipped with a Two Vol ablation cell. The large sample chamber allows 5 normal thin sections and external reference glasses to be loaded and analyzed in a single uninterrupted session.

Argon (Ar) gas is used to plasma, auxiliary and nebuliser (carrier) gas. Helium (He) gas is used to flush the ablated material out of the laser cell, and is then mixed with Ar gas just before entry into the ICP-MS. Thus, nebuliser gas flow is independent of ablation of target materials and transport of aerosol. Recent high-sensitivity analyses in previous studies adopt Ar nebuliser and He carrier gas flow rate as follows: 1.16 L min⁻¹ Ar, 0.2 L min⁻¹ He (Morishita et al., 2005); 0.9 - 1.25 L min⁻¹ Ar, 0.3 L min⁻¹ ¹He (Eggins and Shelley, 2002); 0.8 L min⁻¹ Ar, 0.7 L min⁻¹ He (Regnery et al., 2009). Flow rates of nebuliser gas and He carrier gas correlate with sampling depth and radio-frequency wave (RF) power in the ICP-MS, and finally, affect the sensitivity. In general, increasing the injection gas (nebuliser and He carrier gas) flow rate results in lowering the plasma temperature and thus debasement of sensitivity in case of a hot-plasma condition. However, in case of cool-plasma condition in this study, those decreasing temperature is not serious problem because originally intended for low-plasma temperature and low-RF power. In addition, RF power to maintain the cool-plasma condition is automatically controlled in the Agilent 7700 x. Therefore, based on previous studies, it can be considered that Ar nebulizer gas flow rates of 0.8-1.16 L min-1 does not substantially affect to analytical precision under the 1.2 - 1.55 L min⁻¹ injection gas flow rate, even if we take account of hardware difference in each instruments. On the other hand, since parameters relevant to final analytical precision are associated with each other, fixation of some parameters is required to evaluation of final

Table 1	LA-ICP-MS	operating	parameters

a) Basic operating parameters	
Laser	New Wave NWR213
	Nd:YAG Laser
Wavelength	213 nm
Maximum pulse energy	>30 J cm ⁻² (Fluence)
Spot sizes	110–4 μ m (apertue system)
ICP-MS	Agilent 7700x
Forward power	1550 W
Nebuliser gas flow	1.03 Lmin^{-1} (Ar)
Plasma gas flow	15 L min ⁻¹
Cones	Ni sample cone
	Ni skimmer cone
b) Summary of analytical conditions of L	A system
Laser He carrier gas flow	0.5 L min ⁻¹
Laser pulse repetition rate	5 Hz (continuous Z-focus on)
Laser energy for calibration stdandard	40% (Fluence 2.0 J cm ⁻²)
Laser spot size for calibration standard	100 μm
Laser warm-up & waiting time	8 seconds

analytical precision. For above reasons, we fixed Ar nebuliser gas flow rate as 1 L min⁻¹. This value is an intermediate value of previous studies and had been confirmed by solution method as optimal condition in advance of this study. In the meantime, previous studies adopted wide range of He carrier gas flow rate $(0.2 - 0.7 \text{ L min}^{-1})$. Because He carrier gas flow rate relates to ablation of target materials and efficient transport of aerosol, it is considered that effect for final analytical precision is easily affected by hardware system such as ablation cell. Thus we evaluate appropriate condition in later section.

Prior to analyses, the LA-ICP-MS system was calibrated using NIST 613 reference glass for high sensitivity over a large mass range and low production rate of oxides. The production rate of oxide was monitored by ²⁴⁸ThO/²³²Th and was maintained below 0.5 %. Other potentially interfering oxides were assumed to be negligible compared with the relative ease of Th oxide production (Leichte *et al.*, 1987). Basic instrument operating conditions are given in Table 1.

2.2 Standards, analytical elements and data reduction

NIST synthetic silicate glasses of NIST 612-613 and NIST 610-611 were used as external calibration materials in this study. There are sufficient records of these standards as calibration materials for LA-ICP-MS (e.g., Jochum *et al.*, 2011), and the concentration of elements in NIST 612-613 is appropriate for analysis of common silicate minerals and glasses (e.g., Mason, *et al.*, 1999; Jackson, 2008). In this study, recent values by Jochum *et al.* (2011) along with ISO guidelines were used as reference values for NIST standards, although preferred values of Pearce *et al.* (1997) were adopted for external calibration with NIST 612-613 in most of the previous studies (e.g., Horn *et al.*, 1997; Mason *et al.*, 1999; Kurosawa *et al.*, 2002; Morishita *et al.*, 2005).

Table 2 Analyte elements, isotopes, dwell time per element.

Element	Mass number	Dwell Time (sec.)
Ca	42	0.1
Sc	45	0.1
Ti	47	0.3
V	51	0.3
Cr	53	0.25
Mn	55	0.1
Co	59	0.25
Ni	60	0.25
Cu	63	0.25
Zn	66	0.25
Ga	69	0.25
Ge	72	0.1
As	75	0.25
Rb	85	0.25
Sr	88	0.25
Y	89	0.25
Zr	90	0.25
Nb	93	0.25
Мо	95	0.25
Cd	111	0.25
Sn	118	0.25
Sb	121	0.25
Cs	133	0.1
Ba	137	0.4
La	139	0.25
Ce	140	0.25
Pr	141	0.25
Nd	146	0.25
Sm	14/	0.25
Eu	153	0.25
Gd	157	0.3
Ib	159	0.25
Dy	163	0.4
Ho	165	0.4
Er	166	0.4
Im	169	0.4
Yb	1/2	0.3
Lu	1/5	0.3
Ht T	1/8	0.3
la	181	0.3
W T	182	0.3
11	205	0.3
Pb	208	0.3
BI	209	0.3
I h	232	0.3
U	238	0.3

Analytical elements, mass numbers, and dwell time in this study are shown in Table 2. The dwell time and number of elements are important parameters in optimizing data acquisition procedures (e.g., Günther *et al.*, 1999). Measurement of a large number of elements with a long dwell time for each element results in long acquisition times with ICP-MS, which can lead to attenuation of the signal intensity due to the long laser ablation time. For recent LA-ICP-MS analyses, the time-resolved analysis (TRA) mode has been adopted by many institutions (e.g., Longerich *et al.*, 1996; Horn *et al.*, 1997; Kurosawa *et al.*, 2002; Morishita *et al.*, 2005). Although an advantage of the TRA mode is a reduction of the signal spike which affect the

analytical precision during unstable sample introduction of the LA system, the spectrum mode makes it easier to understand that counting errors depend on low signal intensity expected with lower concentration samples and/or small laser spot diameter, because the measurement deviation for several sets of replicate analyses are given as RSD of the signal counting and quantitative values. LA-ICP-MS analyses are performed with various purposes and various samples in the GSJ-Lab; therefore, an understanding of the limitation of analytical accuracy for each analysis of an unknown by the assayer is very important. In this study, analytical data were collected using the peak hopping and spectrum mode, and 3 sets of 10 scans (sweeps) for 45 elements from ${}^{45}Sc$ to ${}^{238}U$ with dwell times shown in Table 2. The acquisition time was ca. 40 s and the total analysis time including 12 s of shutter-closed laser stabilization time and laser warm-up time for each analysis was ca. 60 s. All signal intensities were corrected with respect to the background signal obtained from measurement of a gas blank for 40 s prior to initiating the calibration standard and unknown measurements. ⁴²Ca was used as an internal standard element and analyzed by pulse-counting mode for all analyses.

Data reduction was conducted using MassHunter Workstation software installed with the Agilent 7700 x. Calibration lines were calculated with the calibration standard and calibration blank as one-point external calibration method, and a series of data reduction, which involved subtraction of the gas blank intensity and calculation of the concentration after normalization using the internal standard element, was performed with the MassHunter software. In addition, selective usage of measured calibration standards and calculation of multi-point calibration lines are also possible with the software. The signal count rate, concentration, and RSDs for each element were reported as standard form. The concentration, signal intensity rate, and type of detectors for each element and each scan could also be confirmed and exported.

3. Results and discussion

3.1 Determination of appropriate operating conditions

To establish precise analysis with LA-ICP-MS, it is important to confirm suitable conditions for the He carrier gas flow rate, repetition rate of the laser and laser energy for efficient and stable introduction of ablated aerosol to the ICP-MS (e.g., Kimura *et al.*, 1996; Hirata and Kon, 2008). Optimized instrumental condition was simply evaluated by the maximal values of signal intensity and its stability in this study. Although we tested individual parameters or settings step by step, these parameters and settings were mutually related to precision of final results. Obviously, following each examination is worth to investigate separately for obtaining "ultimate best" conditions. However such investigations were beyond the purpose of this paper, thus we determined "practical appropriate" conditions for the purpose of simplest and adequate-quality quantitative analyses in this study. The sample used for examination was NIST 613 synthetic silicate glass reference material, unless otherwise specified. In addition, although ICP-MS was used to measure the mass of various ions, these ions are described as elements in this study to avoid complex description.

3.1.1 Flow rate of He carrier gas

Appropriate flow rates of the He carrier gas were examined for the efficient introduction of ablated aerosol into the ICP-MS. For this purpose, the ICP-MS operating conditions were fixed and the laser energy was set at 50 %, while the flow rates of He carrier gas were varied from 0.2 to 0.8 L min⁻¹ with a rate of 0.05 L min⁻¹ for laser spot diameters of 100, 80, 60, 40, 20, and 10 μ m (fluence 11.5–19 J cm⁻²). As described earlier, Ar nabuliser gas flow rate were fixed as 1 L min⁻¹. It is expected that analyses by various sizes of laser spot diameter would be required in case of analyses of silicate "unknown" minerals. Therefore, general tendency of various laser spot diameter were also tested here. The results are shown in Fig. 1.

The operating conditions of the ICP-MS and laser ablation conditions had not been optimized, so that a relatively large scatter was observed in the $< 20 \,\mu m$ spot diameter. Nevertheless, common general features were observed, irrespective of laser spot diameter; the signal count rate of relatively high-mass elements increased with the He carrier gas flow rate, whereas the signal count rate of relatively low-mass elements decreased with an increase in the He carrier gas flow rate. This phenomenon suggests the possible occurrence of mass fractionation from laser ablation to counting in the ICP-MS. Elemental fractionation in LA-ICP-MS has been generally well known in previous studies and several authors have reported different behaviors for different elemental groups, specifically the lithophile, siderophile, and chalcophile elements (e.g., Jackson, 2008). It has been reported that several factors are related to elemental fractionation, such as ionization potentials (Chen, 1999), element melting and boiling points (Outridge et al., 1997), and condensation temperatures (Jackson, 2001). According to Jackson (2001), fractionation occurred, in part, due to two different processes controlled by volatility: (1) differential transport of nanoparticles (condensed vapor) and microparticles (quenched liquid droplets) into which different elements were selectively partitioned on the basis of volatility, and (2) differential volatilization of elements during incomplete volatilization of the microparticles in the ICP (see also Koch et al., 2002, 2004; Kuhn and Günther, 2005). The absolute degree of fractionation that occurs during ablation is highly dependent on numerous factors, including the



Fig. 1 Relationship between laser spot diameter, He carrier gas flow rate, and signal intensity (count rate). Laser energy and instrumental conditions for ICP-MS were fixed under given conditions, and signal intensities (count per second; CPS) of the NIST 613 reference material with different laser spot sizes and He carrier gas flow rates were measured. See text for detailed discussion. laser operation conditions (e.g., spot size, pulse energy and/ or pulse width) and the sample matrix (Günther *et al.*, 1999); however, those parameters and the sample were fixed in this study. Although the observed result suggests mass fractionation rather than the elemental fractionation coupled with elemental groups, it is likely that the differential transport of nano- and microparticles with selectively partitioned elements (i.e., light/ heavy elements), and the difference in the ionization position and conditions in the ICP were the primary causes of fractionation. The appropriate conditions for the efficient generation of an aerosol and a relatively optimal He carrier gas flow rate were thus examined.

The most clearest tendency was observed for a 40 μ m spot diameter accompanied by correlation between the laser energy and analysis conditions of the ICP-MS. In this case, the signal intensity of ¹⁵³Eu was almost constant or changed from a slight increase to decrease with an increase in the He carrier gas flow rate. The signal intensities of elements with mass numbers larger than ¹⁵³Eu were almost constant after increasing the He carrier gas flow rate up to 0.5 L min⁻¹, while that of elements with mass numbers smaller than ¹⁵³Eu were changed from almost constant up until 0.5 L min⁻¹ and were decreased (Fig. 1).

Although the signal intensities varied with different He carrier gas flow rates, the correlation with the signal intensity and concentration between the calibration standard and unknown sample can be ignored when the tendency and rates for variations of correlation between the signal intensities and He carrier gas flow rates were maintained to be constant. Thus, NIST 611 reference materials $(450 - 500 \ \mu g \ g^{-1})$ were also examined, and similar results that were bordered by a He flow rate if 0.5 L min⁻¹ were observed. Based on these results, it is assumed in this study that variation of the signal intensities corresponds to the He carrier gas flow rates and has a constant tendency under appropriate laser ablation conditions, irrespective of the sample concentration and signal intensity itself. Therefore, the boundary of changing tendencies, i.e., $0.5 \ L \ min^{-1}$, was set as the appropriate flow rate for the He carrier gas.

3.1.2 Laser condition and ablation time

Fig. 2 shows typical spectra with signal intensity (counts per second) versus time at a He carrier gas flow rate of 0.5 L min⁻¹. The time between starting ablation and starting count in the ICP-MS was *ca*. 2.5 s. After a rapid increase of counts, the signal count became a gentle increase for some elements. Therefore, counting was started at 8 s after the laser was switched on in this study. After the end of ablation period, the signal intensity returned to the background level after *ca*. 25 s. The NWR 213 laser system is equipped with an ablation cup just above the ablation point; therefore, the length of time before returning

to the background level was almost constant, regardless of the concentration (signal intensities) of elements in various samples, although the sample chamber is large.

In the LA-ICP-MS method, reference glass materials are generally used as external calibration standard(s) for the measurement of minerals and volcanic glasses. There are differences in the ablation efficiency between the reference glasses and unknown samples (e.g., Eggins et al., 1998; Günther and Heinrich, 1999). Therefore, internal standardization is necessary for quantitative analysis to compensate these differences of sampling efficiency (e.g., Kimura et al., 2000). ²⁹Si, ⁴²Ca, ⁴³Ca, or ⁴⁴Ca are commonly used as internal standards, and the concentrations of Si and/or Ca are independently determined using another instrument, such as an electron microprobe analyzer (EPMA). For the method of internal standardization, a quantitative result is obtained from the relationship between the signal intensity ratio of the internal standard element to the target elements, and the concentrations of an external calibration material and measured sample. Therefore, it is not necessary to measure external calibration materials and unknown samples under the same laser conditions; however, suitable measurement conditions for each sample are rather important. For the purpose of microspot analysis, using as small as possible laser spot diameter is frequently required. In such a case, precise measurement of the signal count ratio between the internal standard element and the target elements for external calibration material contribute to improve the accuracy of the quantitative result. Therefore, the laser spot diameter for analysis of the external calibration material was fixed at 100 μ m and the appropriate laser conditions were examined.

Sample introduction by laser ablation is relatively unstable compared to that by a nebulizer for the solution method; therefore, considerable variation of the signal intensities is unavoidable. Although an increased repetition rate of the laser pulse led to a more continuous and stable signal, defocusing of the laser and attenuation of the signal intensity due to a higher ablation rate also occurred simultaneously (e.g., Kimura et al., 1996; Hirata and Kon, 2008). Consequently, the integration time could possibly be limited by increasing repetition rate. Thus, optimization of the laser energy, repetition rate, and acquisition time with a suitable carrier gas flow rate is required for stable and precise signal counting. To determine the appropriate laser ablation conditions for an external calibration material, test analyses with change in the laser energy at 5 % steps from 30-45% (fluence 0.2-4.0 J cm⁻²) were conducted at a He carrier gas flow of 0.5 L min⁻¹ and with a laser spot diameter of 100 µm. Three sets of 20 scans for 45 elements from ⁴⁵Sc to ²³⁸U were performed using the ICP-MS, and the stability of three replicate analyses was evaluated according to the relative



Fig. 2 Typical LA-ICP-MS calibration spectra for ⁶⁶Zn, ⁸⁹Y, ¹³³Cs, ¹⁵⁷Gd, ¹⁷²Yb, ²⁰⁸Pb, and ²³⁸U showing intensity (CPS) versus time for NIST 613 glass using a 100 µm pit diameter. The acquisition procedure included background measurement of the dry plasma for 40 s prior to ablation for 50 s. After ablation was stopped, the signal returned to background levels after *ca*. 25 s.

standard deviation (RSD) of the signal intensities. The results are shown in Fig. 3.

From a comparison of different laser energies, an RSD of *ca*. 20 % for signal intensities at laser energies of 40 % (fluence *ca*. 2.0 J cm⁻²) and 45 % (fluence *ca*. 6.0 J cm⁻²) was the smallest level, and that at 40 % was slightly better than that at 45 % (Fig. 3). In the case of 35 % laser energy, RSD was relatively large (*ca*. 30 %), and that at 30 % laser energy was very large due to insufficient ablation.

A laser energy of 40 % (fluence *ca*. 2.0 J cm⁻²) at a He carrier gas flow of 0.5 L min⁻¹ and a laser spot diameter of 100 μ m was thus regarded as the most appropriate condition for ablation of the external calibration material. One of the reasons for the large (20 %) RSD with this condition would be defocusing by ablation. Therefore, the effect of focusing during laser ablation (continuous z-focus) was also examined. The results of laser ablation with continuous z-focus show an RSD of less than 15 % for many elements (Fig. 3); therefore, the analytical precision of for measurement of the external calibration material were improved compared to that without continuous z-focus (fixed z-axis ablation).

According to analytical reports from other institutions, recent analytical protocols adopted by other institutions were laser pulse repetition rates of 5 Hz or 10 Hz (e.g., Eggins and Shelley, 2002; Kurosawa *et al.*, 2002; Morishita *et al.*, 2005; Regnery *et al.*, 2010). Although both 5 Hz and 10 Hz were tested with the same conditions of He carrier gas flow rate and laser energy, there was no advantage for a laser pulse repetition rate of 10 Hz, while adequately stable signal intensities were obtained at 5 Hz, as shown by Fig. 2. Increasing the laser pulse repetition rate results in an increase in the ablation rate at the same laser power. Such aggressive ablation could be a possible cause of mechanical prevention of recovering aerosols by the crater wall, the so-called crater effect (Mason and Mank, 2001). A lower repetition rate contributes to preventing such a phenomenon that is impossible to compensate for solely by the use of continuous z-focus; therefore, of laser pulse repetition rate of 5 Hz was adopted in this study. Analytical conditions of LA system for calibration standard are summarized in Table 1b.

3.2 Analytical results of reference materials3.2.1 Sensitivity and detection limits

Table 3 shows the analytical results for NIST 615 using NIST 613 as an external calibration standard, typical background count rates, and the lower limit of detection (DL) calculated using sensitivities for each pit diameter. The results for NIST 613 using NIST 611 as an external calibration standard are shown in Table 4. The results for the calibration blank measured before each



Fig. 3 Relative standard deviations (RSD) of the intensity (CPS) determined for NIST 613 with various laser energy and in continuous z-focus mode.

five replicate analyses are shown as a typical background count because the background drifts during the replicate analyses. The DL and sensitivity were calculated according to the widely used method reported by Longerich *et al.* (1996). Although the DL should be calculated for each element and each analytical result (Longerich *et al.*, 1996), for convenience, the averaged values of individual replicate analyses are shown in Table 3 and Table 4. The DL tends to improve with an increase in of the amount of material sampled, as suggested by Morishita *et al.* (2005).

3.2.2 Analytical precision and accuracy

Laser spot diameters of 100, 80, 40, and 20 μ m for NIST 615, and 80, 40, 20, and 10 μ m for NIST 613 were used for the analyses. Five replicate analyses were performed for each laser spot size and NIST glass. The averaged values, and the DIFs between the averaged and reference values of Jochum *et al.* (2011) (absolute value, DIF; percentage of DIF in reference value, DIF%), and standard deviation (SD) and relative standard deviation (RSD) replicate analyses were also shown in Table 3 and Table 4. Fig. 4 shows DIF % for the reference value reported by Jochum *et al.* (2011).

The numbers of elements in multi-element LA-ICP-MS analysis of geologic samples are generally less than 30 elements, and division into two sets of data acquisition is often adopted for analysis with a large number of elements (> 30 elements)

(e.g., Horn *et al.*, 1997; Kurosawa *et al.*, 2002; Morishita *et al.*, 2005). Therefore, analysis of the 45 elements (+1 internal standard element) in this study covered a very wide range of mass numbers compared to common analytical methods used in many institutions. Nevertheless, the reproducibility (precision) was mostly < 10 % with laser spot diameters of $100 - 80 \mu m$ for NIST 615, and only Ni and Zn in 100 μm and Ni in 80 μm were over 15 %. In the case of laser spot diameters <40 μm , the RSDs were relatively large, and the sensitivity was small for 20 μm . For analyses of NIST 613, the RSDs of the signal intensities were <10 % for all elements with laser spot diameters >40 μm and <15 % for all elements in a 20 – 10 μm laser spot diameter.

For evaluation of accuracy, the analytical results for NIST 615 using NIST 613 as an external calibration standard are shown in Table 3 and Fig. 4a. For laser spot diameters of $100 - 40 \mu$ m, all elements except for Sc in all laser spot diameters and Mn at 40 μ m, the DIF was less than 30 %. On the other hand, in case of a 20 μ m laser spot diameter, the DIFs of 11 elements were over 30 %. Specifically, Ti, V, Mn, Co, Ni, Zn, Ge, Rb, Sr, Y, Zr, Nb, Mo, Cd, Sn, Sb, Cs, Na, La, Ce, Pr, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Hf, Ta, W, Tl, Pb, Bi, Th, and U for a laser spot diameter of 100 μ m, Ti, V, Mn, Co, Ni, Zn, As, Rb, Sr, Y, Nb, Mo, Cd, Sn, Sb, Cs, Ba, La, Ce, Pr, Nd, Sm, Eu, Er, Tm, Yb, Lu, Ta, W, Tl, Pb, Bi, and U for 80 μ m, Ti, Ni, Ga, Rb, Sr, Nb, Sn, Sb, Cs, Ba, La, Pr, Eu, Ta, Tl, Pb, Bi, and U for 40 μ m, and

Table 3 Quantitative results of replicate analyses (N=5) for NIST 615 determined using four pit diameters (100, 80, 40 and 20 μ m).

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 | 80 //m | | | |
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51/			
 | 50 |
 | DIE
 | | 00 (1 ~) | DOD
 | 0 | | | DIE
 | 00 μ m | 00 (1 | DOD | 0 |
 |
| rt v
 | BG | AV
 | DIF
 | DIF 76 | 50(10) | RSD
 | Sensitivity | DL | AV | DIF
 | DIF 70 | 50(10) | RSD | Sensitivity | DL
 |
| (µgg')
 | (cps) | (µgg')
 | (µgg')
 | (%) | (µgg') | (%)
 | (cps/μgg') | (µgg') | (µgg') | (µgg')
 | (%) | (µgg') | (%) | (cps/μgg') | (µgg')
 |
| Sc 0.74
 | 348 | 2.46
 | 1.72
 | 232 | 0.056 | 2.26
 | 865 | 0.000 | 2.26 | 1.52
 | 205 | 0.069 | 3.05 | 937 | 0.001
 |
| Ti 3.61
 | 21.1 | 3.46
 | 0.15
 | 4.05 | 0.340 | 9.82
 | 51 | 0.009 | 3.29 | 0.32
 | 9.0 | 0.343 | 10.4 | 57 | 0.016
 |
| V 1.01
 | 28.9 | 1 01
 | 0.00
 | 0 4 9 | 0.038 | 3 74
 | 1077 | 0.000 | 1.01 | 0.00
 | 0.23 | 0.009 | 0.9 | 1143 | 0.001
 |
| 0 1 10
 | 61.1 | 1.04
 | 0.15
 | 12.24 | 0.072 | 7.0
 | 102 | 0.006 | 1.02 | 0.17
 | 1/10 | 0.150 | 14 72 | 112 | 0.000
 |
| Or 1.19
 | 1017 | 1.04
 | 0.15
 | 12.34 | 0.073 | 7.0
0.55
 | 1150 | 0.000 | 1.02 | 0.17
 | 0.7 | 0.100 | 14.75 | 1010 | 0.008
 |
| Mn 1.42
 | 1017 | 1.47
 | 0.05
 | 3.7 | 0.141 | 9.55
 | 1152 | 0.001 | 1.37 | 0.05
 | 3.7 | 0.198 | 14.5 | 1312 | 0.001
 |
| Co 0.79
 | 10.67 | 0.75
 | 0.04
 | 4.92 | 0.039 | 5.16
 | 975 | 0.001 | 0.74 | 0.05
 | 6.4 | 0.038 | 5.12 | 1063 | 0.001
 |
| Ni 1.1
 | 158 | 1.16
 | 0.06
 | 5.6 | 0.238 | 20.5
 | 200 | 0.003 | 1.09 | 0.01
 | 1.3 | 0.170 | 15.62 | 209 | 0.005
 |
| 0 1.27
 | 127 | 1 0 2
 | 0.45
 | 22.1 | 0.095 | 464
 | 405 | 0.001 | 1 74 | 0.27
 | 26.0 | 0.106 | 6 1 1 | 524 | 0.002
 |
| 0u 1.57
 | 157 | 1.02
 | 0.45
 | 00.1 | 0.000 | 40.70
 | 400 | 0.001 | 1.74 | 0.07
 | 20.0 | 0.100 | 0.11 | 524 | 0.002
 |
| Zn 2.79
 | 34.7 | 3.03
 | 0.24
 | 8.48 | 0.599 | 19.79
 | /2 | 0.011 | 2.71 | 0.08
 | 2.89 | 0.395 | 14.6 | /9 | 0.016
 |
| Ga 1.31
 | 6.7 | 1.16
 | 0.15
 | 11.81 | 0.040 | 3.47
 | 867 | 0.001 | 1.17 | 0.14
 | 11.00 | 0.088 | 7.52 | 896 | 0.001
 |
| Ge 0.942
 | 133 | 1 04
 | 0.09
 | 10.0 | 0.099 | 9 5 9
 | 319 | 0.003 | 1 04 | 0.10
 | 10.8 | 0 135 | 13.0 | 314 | 0.004
 |
| Ac 0.74
 | 0.0 | 0.65
 | 0.00
 | 12.55 | 0.070 | 101
 | 102 | 0.000 | 0.71 | 0.02
 | 4 97 | 0.172 | 24.5 | 102 | 0.011
 |
| AS 0.74
 | 8.0 | 0.05
 | 0.09
 | 12.55 | 0.078 | 12.1
 | 102 | 0.008 | 0.71 | 0.03
 | 4.27 | 0.173 | 24.J | 102 | 0.011
 |
| Rb 0.855
 | 20.0 | 0.85
 | 0.01
 | 0.98 | 0.071 | 8.35
 | 1111 | 0.000 | 0.81 | 0.04
 | 5.12 | 0.022 | 2.73 | 1242 | 0.001
 |
| Sr 45.8
 | 2.67 | 47.5
 | 1.7
 | 3.63 | 0.638 | 1.34
 | 1407 | 0.000 | 45.8 | 0.0
 | 0.04 | 0.721 | 1.57 | 1561 | 0.001
 |
| Y 0.79
 | 2 67 | 0 7 9
 | 0.00
 | 0.52 | 0.041 | 512
 | 1410 | 0.000 | 0.85 | 0.06
 | 71 | 0.057 | 6 74 | 1558 | 0.001
 |
| 7 0.040
 | 0.00 | 0.00
 | 0.00
 | 0.04 | 0.051 | 5 50
 | 714 | 0.001 | 0.00 | 0.10
 | 15.4 | 0.076 | 7 70 | 707 | 0.001
 |
| 21 0.040
 | 0.00 | 0.93
 | 0.08
 | 9.34 | 0.051 | 0.04
 | 1407 | 0.001 | 0.98 | 0.13
 | 1 70 | 0.070 | 1.12 | 1010 | 0.001
 |
| ND 0.624
 | 2.07 | 0.62
 | 0.01
 | 0.01 | 0.051 | 0.24
 | 1407 | 0.000 | 0.61 | 0.01
 | 1.70 | 0.040 | 4.9 | 1012 | 0.001
 |
| Mo 0.8
 | 0.00 | 0.79
 | 0.01
 | 1.14 | 0.047 | 5.93
 | 274 | 0.002 | 0.80 | 0.00
 | 0.44 | 0.047 | 5.9 | 299 | 0.003
 |
| Cd 0.56
 | 5.8 | 0.55
 | 0.01
 | 2.6 | 0.046 | 8.4
 | 67 | 0.013 | 0.57 | 0.01
 | 1.11 | 0.069 | 12.1 | 73 | 0.015
 |
| Sn 1.68
 | 58.7 | 1.59
 | 0.09
 | 5.65 | 0.094 | 5.93
 | 506 | 0.001 | 1.58 | 0.10
 | 6.08 | 0.126 | 8.0 | 554 | 0.002
 |
| Sh 0.70
 | 5.2 | 0.76
 | 0.02
 | 4.95 | 0.024 | 2 22
 | 620 | 0.001 | 0.72 | 0.07
 | 0.25 | 0.062 | 0.0 | 667 | 0.002
 |
| 0.73
 | 0.0 | 0.70
 | 0.00
 | 4.25 | 0.024 | 5.22
 | 020 | 0.001 | 0.72 | 0.07
 | 0.20 | 0.000 | 0.0 | 1011 | 0.002
 |
| Gs 0.004
 | 177 | 0.71
 | 0.04
 | 0.0 | 0.042 | 5.98
 | 1/35 | 0.000 | 0.70 | 0.04
 | 0.1 | 0.093 | 13.15 | 1914 | 0.001
 |
| Ba 3.2
 | 0.00 | 3.46
 | 0.26
 | 7.98 | 0.126 | 3.65
 | 228 | 0.001 | 3.28 | 0.08
 | 2.54 | 0.100 | 3.05 | 257 | 0.004
 |
| La 0.72
 | 2.67 | 0.72
 | 0.00
 | 0.63 | 0.054 | 7.61
 | 1777 | 0.000 | 0.74 | 0.02
 | 2.37 | 0.050 | 6.8 | 2005 | 0.000
 |
| Ce 0.813
 | 0.00 | 0.82
 | 0.01
 | 1 10 | 0.021 | 2 5 1
 | 2022 | 0.000 | 0 78 | 0.04
 | 4 58 | 0.027 | 34 | 2241 | 0.000
 |
| D. 0.760
 | 4.00 | 0.02
 | 0.06
 | 7 1 7 | 0.020 | 4 57
 | 0107 | 0.000 | 0.70 | 0.01
 | 1 77 | 0.044 | 5.67 | 0517 | 0.000
 |
| Fr 0.708
 | 4.00 | 0.62
 | 0.00
 | 7.17 | 0.038 | 4.37
 | 2107 | 0.000 | 0.78 | 0.01
 | 1.77 | 0.044 | 5.07 | 2017 | 0.000
 |
| Nd 0.752
 | 2.67 | 0.84
 | 0.09
 | 12.33 | 0.102 | 12.06
 | 359 | 0.001 | 0.81 | 0.06
 | 8.05 | 0.106 | 13.1 | 403 | 0.002
 |
| Sm 0.754
 | 0.00 | 0.83
 | 0.08
 | 10.25 | 0.071 | 8.5
 | 297 | 0.001 | 0.79 | 0.03
 | 4.39 | 0.079 | 10.0 | 353 | 0.003
 |
| Eu 0.77
 | 5.33 | 0.80
 | 0.03
 | 3.44 | 0.041 | 5.10
 | 1224 | 0.000 | 0.79 | 0.02
 | 2.12 | 0.042 | 5.4 | 1391 | 0.001
 |
| Gd 0 763
 | 2.22 | 0.80
 | 0.04
 | 5.41 | 0.067 | 8.3
 | 310 | 0.002 | 0.84 | 0.08
 | 10 2 | 0.083 | 9.9 | 354 | 0.002
 |
| Th 0.720
 | 267 | 0.00
 | 0.07
 | 0.65 | 0.045 | 5.50
 | 2000 | 0.000 | 0.04 | 0.11
 | 14.0 | 0.067 | 7.96 | 2216 | 0.000
 |
| 10 0.738
 | 2.07 | 0.01
 | 0.07
 | 5.00 | 0.045 | 0.02
 | 2000 | 0.000 | 0.00 | 0.11
 | 14.9 | 0.007 | 7.00 | 2310 | 0.000
 |
| Dy 0.746
 | 0.00 | 0.79
 | 0.05
 | 6.19 | 0.051 | 6.42
 | 490 | 0.001 | 0.83 | 0.08
 | 10.7 | 0.063 | 1.65 | 559 | 0.001
 |
| Ho 0.749
 | 2.67 | 0.78
 | 0.03
 | 3.54 | 0.019 | 2.42
 | 1937 | 0.000 | 0.84 | 0.09
 | 11.7 | 0.033 | 3.9 | 2221 | 0.000
 |
| Er 0.74
 | 0.00 | 0.79
 | 0.05
 | 6.47 | 0.045 | 5.76
 | 661 | 0.001 | 0.80 | 0.06
 | 8.04 | 0.024 | 3.0 | 749 | 0.001
 |
| Tm 0.732
 | 2.22 | 0.74
 | 0.01
 | 1 /0 | 0.043 | 5.82
 | 2035 | 0.000 | 0.78 | 0.05
 | 6.40 | 0.027 | 3 5 3 | 2388 | 0.000
 |
| 1111 0.752
 | 2.22 | 0.74
 | 0.01
 | 1.45 | 0.045 | 0.02
 | 2000 | 0.000 | 0.70 | 0.00
 | 0.40 | 0.027 | 0.00 | 2000 | 0.000
 |
| Yb 0.777
 | 1.11 | 0.77
 | 0.01
 | 0.83 | 0.016 | 2.07
 | 450 | 0.001 | 0.85 | 0.07
 | 9.30 | 0.042 | 4.93 | 500 | 0.001
 |
| Lu 0.732
 | 2.22 | 0.78
 | 0.05
 | 6.19 | 0.041 | 5.29
 | 1950 | 0.000 | 0.80 | 0.07
 | 9.5 | 0.034 | 4.26 | 2264 | 0.000
 |
| Hf 0.711
 | 1.11 | 0.76
 | 0.05
 | 7.43 | 0.041 | 5.40
 | 602 | 0.001 | 0.83 | 0.12
 | 16.92 | 0.087 | 10.5 | 668 | 0.001
 |
| To 0.808
 | 1.11 | 0.77
 | 0.03
 | 4 18 | 0.022 | 2.86
 | 2225 | 0.000 | 0.80 | 0.01
 | 1.00 | 0.000 | 1.07 | 2506 | 0.000
 |
| 14 0.000
 | 0.00 | 0.77
 | 0.00
 | 4.10 | 0.022 | 2.00
 | 2225 | 0.000 | 0.00 | 0.01
 | 0.1 | 0.003 | 0.00 | 2000 | 0.000
 |
| W 0.806
 | 2.22 | 0.80
 | 0.00
 | 0.20 | 0.040 | 5.02
 | 609 | 0.001 | 0.76 | 0.05
 | 0.1 | 0.063 | 8.30 | 691 | 0.001
 |
| TI 0.273
 | 4.4 | 0.28
 | 0.01
 | 4.21 | 0.015 | 5.32
 | 1368 | 0.000 | 0.28 | 0.01
 | 3.57 | 0.018 | 6.52 | 1536 | 0.001
 |
| Pb 2.32
 | 60.0 | 2.38
 | 0.06
 | 2.79 | 0.066 | 2.78
 | 1049 | 0.000 | 2.38 | 0.06
 | 2.60 | 0.063 | 2.7 | 1190 | 0.001
 |
| Bi 0.581
 | 44 | 0.58
 | 0.00
 | 0.57 | 0.023 | 4 00
 | 1747 | 0.000 | 0.58 | 0.00
 | 0.27 | 0.016 | 2.8 | 2002 | 0.001
 |
| Th 0.001
 | 1.11 | 0.00
 | 0.05
 | 6.07 | 0.020 | 5.01
 | 1660 | 0.000 | 0.00 | 0.00
 | 10.21 | 0.010 | 2.0 | 1025 | 0.001
 |
| 0.740
 | 1.11 | 0.79
 | 0.05
 | 0.22 | 0.047 | J.91
 | 1008 | 0.000 | 0.83 | 0.08
 | 10.31 | 0.031 | 3.7 | 1033 | 0.000
 |
|
 | |
 | 11110
 | | 111133 |
 | / / | | 0.02 | ()()()
 | 0.43 | 0.032 | 4.0 | 25/3 | 0.000
 |
| 0 0.023
 | 2.22 | 0.89
 | 0.00
 | 7.00 | 0.000 | 0.02
 | 2102 | 0.000 | 0.02 | 0.00
 | | | | |
 |
| 0 0.823
 | 2.22 | 0.09
 | 0.00
 | 7.00 | 0.000 | 0.02
 | 2102 | 0.000 | 0.02 | 0.00
 | | | | |
 |
| 0 0.823
 | | 0.09
 | 0.00
 | 40 μm | 0.000 | 0.02
 | 2102 | 0.000 | | 0.00
 | 20 μm | 00 (1 -) | 202 | 0 |
 |
| <u> </u>
 | BG | AV .
 | DIF
 | 40 μm
DIF% | SD (1 g) | RSD
 | Sensitivity | DL | AV | DIF
 | 20 μm
DIF% | SD (1 g) | RSD | Sensitivity | DL .
 |
| RV
(μgg ⁻¹)
 | BG
(cps) | ΑV
(μgg ⁻¹)
 | DIF
(μgg ⁻¹)
 | 40 μm
DIF%
(%) | SD (1 σ)
(μg g ⁻¹) | RSD
(%)
 | Sensitivity
(cps/µg g ⁻¹) | DL
(µgg ⁻¹) | ΑV
(μgg ⁻¹) | DIF
(μgg ⁻¹)
 | 20 μm
DIF%
(%) | $SD(1\sigma)$ $(\mu g g^{-1})$ | RSD
(%) | Sensitivity
(cps/μgg ⁻¹) | DL
(μgg ⁻¹)
 |
| $RV = \frac{\mu g g^{-1}}{Sc} 0.74$
 | BG
(cps)
348 | ΑV
(μgg ⁻¹)
1.91
 | DIF
(µgg ⁻¹)
1.17
 | 40 μm
DIF%
(%) | SD (1 σ)
($\mu g g^{-1}$)
0.296 | RSD
(%)
15.53
 | Sensitivity
(cps/µgg ⁻¹)
231 | DL
(μgg ⁻¹)
0.002 | ΑV
(μgg ⁻¹)
2.77 | DIF
(µgg ⁻¹)
2.03
 | 20 μm
DIF%
(%)
275 | SD (1 σ)
($\mu g g^{-1}$)
0.203 | RSD
(%)
7.3 | Sensitivity
(cps/µgg ⁻¹)
91 | DL
(µgg ⁻¹)
0.008
 |
| RV
$(\mu g g^{-1})$
Sc 0.74
Ti 361
 | BG
(cps)
348
21.1 | ΑV
(μgg ⁻¹)
1.91
3.61
 | DIF
(µgg ⁻¹)
1.17
 | 40 μm
DIF%
(%)
158
0.1 | SD (1 σ)
(μg g ⁻¹)
0.296 | RSD
(%)
15.53
 | Sensitivity
(cps/µgg ⁻¹)
231 | $\frac{DL}{(\mu g g^{-1})}$ 0.002 | AV
(μgg ⁻¹)
2.77
2.86 | DIF
$(\mu g g^{-1})$
2.03
0.75
 | 20 μm
DIF%
(%)
275
20.8 | SD (1 σ)
(μ g g ⁻¹)
0.203
1.032 | RSD
(%)
7.3 | Sensitivity
$(cps/\mu g g^{-1})$
91
6 | DL
$(\mu g g^{-1})$
0.008
0.554
 |
|
 | BG
(cps)
348
21.1 | ΑV
(μgg ⁻¹)
1.91
3.61
 | DIF
$(\mu g g^{-1})$
1.17
0.00
0.24
 | 40 μm
DIF%
(%)
158
0.1 | SD (1 σ)
(μ g g ⁻¹)
0.296
0.554 | RSD
(%)
15.53
15.32
 | Sensitivity
(cps/µgg ⁻¹)
231
14 | DL
(μgg ⁻¹)
0.002
0.072 | AV
(μgg ⁻¹)
2.77
2.86 | DIF
$(\mu g g^{-1})$
2.03
0.75
 | 20 μm
DIF%
(%)
275
20.8 | SD (1σ)
$(\mu g g^{-1})$
0.203
1.032
0.106 | RSD
(%)
7.3
36.1 | Sensitivity
$(cps/\mu g g^{-1})$
91
6
100 | DL
$(\mu g g^{-1})$
0.008
0.554
 |
| $ \begin{array}{r} \text{RV} \\ (\mu g g^{-1}) \\ \text{Sc} & 0.74 \\ \text{Ti} & 3.61 \\ \text{V} & 1.01 \\ \end{array} $
 | BG
(cps)
348
21.1
28.9 | AV
(μg g ⁻¹)
1.91
3.61
0.77
 | DIF
(µgg ⁻¹)
1.17
0.00
0.24
 | 40 μ m
DIF%
(%)
158
0.1
24.2 | $\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu \text{g} \text{g}^{-1}) \\ 0.296 \\ 0.554 \\ 0.074 \\ 0.074 \end{array}$ | RSD
(%)
15.53
15.32
9.67
 | Sensitivity
(cps/µgg ⁻¹)
231
14
281 | DL
(μgg ⁻¹)
0.002
0.072
0.003 | AV
(μgg ⁻¹)
2.77
2.86
1.01 | DIF
(µgg ⁻¹)
2.03
0.75
0.00
 | 20 μm
DIF%
(%)
275
20.8
0.04 | SD (1σ)
$(\mu g g^{-1})$
0.203
1.032
0.196 | RSD
(%)
7.3
36.1
19.4 | Sensitivity
$\frac{(cps/\mu g g^{-1})}{91}$ 6 109 | DL
$(\mu g g^{-1})$
0.008
0.554
0.004
 |
| $\begin{array}{c} \text{RV} \\ (\mu_{gg}^{-1}) \\ \text{Sc} & 0.74 \\ \text{Ti} & 3.61 \\ \text{V} & 1.01 \\ \text{Cr} & 1.19 \end{array}$
 | BG
(cps)
348
21.1
28.9
61.1 | AV
(μgg ⁻¹)
1.91
3.61
0.77
0.98
 | DIF
(µgg ⁻¹)
1.17
0.00
0.24
0.21
 | 40 μm
DIF%
(%)
158
0.1
24.2
17.3 | $\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu \text{g g}^{-1}) \\ 0.296 \\ 0.554 \\ 0.074 \\ 0.356 \end{array}$ | RSD
(%)
15.53
15.32
9.67
36.2
 | Sensitivity
(cps/μgg ⁻¹)
231
14
281
27 | DL
(μgg ⁻¹)
0.002
0.072
0.003
0.094 | AV
(μgg ⁻¹)
2.77
2.86
1.01
<i>1.48</i> | DIF
(µgg ⁻¹)
2.03
0.75
0.00
0.29
 | 20 μm
DIF%
(%)
275
20.8
0.04
24 | SD (1 σ)
(μgg ⁻¹)
0.203
1.032
0.196
0.957 | RSD
(%)
7.3
36.1
19.4
<i>64.6</i> | Sensitivity
(cps/µgg ⁻¹)
91
6
109
<i>16</i> | DL
(µgg ⁻¹)
0.008
0.554
0.004
<i>0.352</i>
 |
| $\begin{array}{c} \text{RV} \\ (\mu g g^{-1}) \\ \text{Sc} & 0.74 \\ \text{Ti} & 3.61 \\ \text{V} & 1.01 \\ \text{Cr} & 1.19 \\ \text{Mn} & 1.42 \end{array}$
 | BG
(cps)
348
21.1
28.9
61.1
1017 | AV
(μgg ⁻¹)
1.91
3.61
0.77
0.98
0.81
 | DIF
(μgg ⁻¹)
1.17
0.00
0.24
0.21
0.61
 | 40 μm
DIF%
(%)
158
0.1
24.2
17.3
43 | $\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu \text{g} \text{g}^{-1}) \\ 0.296 \\ 0.554 \\ 0.074 \\ 0.356 \\ 0.198 \end{array}$ | RSD
(%)
15.53
15.32
9.67
36.2
24.57
 | Sensitivity
(cps/μgg ⁻¹)
231
14
281
27
324 | DL
(μgg ⁻¹)
0.002
0.072
0.003
0.094
0.005 | AV
(μg g ⁻¹)
2.77
2.86
1.01
<i>1.48</i>
1.80 | DIF
(µgg ⁻¹)
2.03
0.75
0.00
0.29
0.38
 | 20 μm
DIF%
(%)
275
20.8
0.04
24
27 | SD (1σ)
$(\mu g g^{-1})$
0.203
1.032
0.196
0.957
0.830 | RSD
(%)
7.3
36.1
19.4
<i>64.6</i>
46.18 | Sensitivity
(cps/µgg ⁻¹)
91
6
109
<i>16</i>
126 | DL
(µgg ⁻¹)
0.008
0.554
0.004
<i>0.352</i>
0.022
 |
| $\begin{array}{c} \text{RV} \\ (\mu g g^{-1}) \\ \text{Sc} & 0.74 \\ \text{Ti} & 3.61 \\ \text{V} & 1.01 \\ \text{Cr} & 1.19 \\ \text{Mn} & 1.42 \\ \text{Co} & 0.79 \end{array}$
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67 | AV
(μgg ⁻¹)
1.91
3.61
0.77
0.98
0.81
0.69
 | DIF
(µgg ⁻¹)
1.17
0.00
0.24
0.21
0.61
0.10
 | 40 μm
DIF%
(%)
158
0.1
24.2
17.3
43
12.1 | SD (1 σ)
(μg g ⁻¹)
0.296
0.554
0.074
0.356
0.198
0.118 | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
 | Sensitivity
(cps/µgg ⁻¹)
231
14
281
27
324
253 | DL
(μgg ⁻¹)
0.002
0.072
0.003
0.094
0.005
0.002 | AV
(μgg ⁻¹)
2.77
2.86
1.01
<i>1.48</i>
1.80
0.80 | DIF
(µgg ⁻¹)
2.03
0.75
0.00
0.29
0.38
0.01
 | 20 μm
DIF%
(%)
275
20.8
0.04
24
27
1.2 | $SD (1 \sigma) (\mu g g^{-1}) 0.203 1.032 0.196 0.957 0.830 0.269$ | RSD
(%)
7.3
36.1
19.4
<i>64.6</i>
46.18
33.71 | Sensitivity
(cps/μgg ⁻¹)
91
6
109
<i>16</i>
126
105 | $\begin{array}{c} \text{DL} \\ (\mu g g^{-1}) \\ 0.008 \\ 0.554 \\ 0.004 \\ 0.352 \\ 0.022 \\ 0.006
\end{array}$ |
| $\begin{array}{c} \text{RV} \\ (\mu \text{gg}^{-1}) \\ \text{Sc} & 0.74 \\ \text{Ti} & 3.61 \\ \text{V} & 1.01 \\ \text{Cr} & 1.19 \\ \text{Mn} & 1.42 \\ \text{Co} & 0.79 \\ \text{Ni} & 1.1 \end{array}$
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158 | AV
(μg g ⁻¹)
1.91
3.61
0.77
0.98
0.81
0.69
1.10
 | $\begin{array}{c} \text{DIF} \\ (\mu \text{g g}^{-1}) \\ 1.17 \\ 0.00 \\ 0.24 \\ 0.21 \\ 0.61 \\ 0.10 \\ 0.00 \end{array}$
 | 40 μm
DIF%
(%)
158
0.1
24.2
17.3
43
12.1
0 | $\frac{\text{SD}(1\sigma)}{(\mu_{gg}^{-1})}$ 0.296 0.554 0.074 0.356 0.198 0.118 0.224 | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
 | Sensitivity
(cps/µgg ⁻¹)
231
14
281
27
324
253
51 | $\begin{array}{c} \text{DL} \\ (\mu g g^{-1}) \\ 0.002 \\ 0.072 \\ 0.003 \\ 0.094 \\ 0.005 \\ 0.002 \\ 0.035 \end{array}$ | | DIF
$(\mu g g^{-1})$
2.03
0.75
0.00
0.29
0.38
0.01
0.14
 | 20 μm
DIF%
(%)
275
20.8
0.04
24
27
1.2
1.2 | SD (1σ)
$(\mu g g^{-1})$
0.203
1.032
0.196
0.957
0.830
0.269
0.343 | RSD
(%)
7.3
36.1
19.4
<i>64.6</i>
46.18
33.71
27.7 | Sensitivity
(cps/μgg ⁻¹)
91
6
109
<i>16</i>
126
105
20 | DL
(µgg ⁻¹
)
0.008
0.554
0.004
0.352
0.022
0.006
0.231 |
| RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.1
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158 | AV
(μgg ⁻¹)
1.91
3.61
0.77
0.98
0.81
0.69
1.10
 | DIF
(μgg ⁻¹)
1.17
0.00
0.24
0.21
0.61
0.10
0.00
 | 40 μm
DIF%
(%)
158
0.1
24.2
17.3
43
12.1
0 | $\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu \text{g} \text{g}^{-1}) \\ 0.296 \\ 0.554 \\ 0.074 \\ 0.356 \\ 0.198 \\ 0.118 \\ 0.224 \\ 0.256 \end{array}$ | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
 | Sensitivity
(cps/µgg ⁻¹)
231
14
281
27
324
253
51 | DL
(µgg ⁻¹)
0.002
0.072
0.003
0.094
0.005
0.002
0.005 | AV
(μgg ⁻¹)
2.77
2.86
1.01
1.48
1.80
0.80
1.24 | DIF
$(\mu g g^{-1})$
2.03
0.75
0.00
0.29
0.38
0.01
0.14
0.14
 | 20 μm
DIF%
(%)
275
20.8
0.04
24
27
1.2
1.2 | SD (1σ)
$(\mu g g^{-1})$
0.203
1.032
0.196
0.957
0.830
0.269
0.343 | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7 | Sensitivity
(cps/μgg ⁻¹)
91
6
109
<i>16</i>
126
105
20 | DL
(µgg ⁻¹)
0.008
0.554
0.004
<i>0.352</i>
0.022
0.006
<i>0.231</i>
 |
| $\begin{array}{c c} & & & & \\ & &$
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158
137 | AV (μgg ⁻¹) 1.91 3.61 0.77 0.98 0.81 0.69 1.10 1.74
 | DIF
(µgg ⁻¹)
1.17
0.00
0.24
0.21
0.61
0.10
0.00
0.37
 | 40 μm DIF% (%) 158 0.1 24.2 17.3 43 12.1 0 27.3 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mugg^{-1}) \\ 0.296 \\ 0.554 \\ 0.356 \\ 0.198 \\ 0.118 \\ 0.224 \\ 0.253 \end{array}$ | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
 | Sensitivity
(cps/ µg g ⁻¹)
231
14
281
27
324
253
51
129 | $\begin{array}{c} \begin{array}{c} DL \\ (\mu g g^{-1}) \\ 0.002 \\ 0.072 \\ 0.003 \\ 0.094 \\ 0.005 \\ 0.005 \\ 0.005 \end{array}$ | AV
(μgg ⁻¹)
2.77
2.86
1.01
<i>1.48</i>
1.80
0.80
<i>1.24</i>
1.49 | DIF
$(\mu g g^{-1})$
2.03
0.75
0.00
0.29
0.38
0.01
0.14
0.12
 | 20 µm
DIF%
(%)
275
20.8
0.04
24
27
1.2
12
9 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mugg^{-1})\\ 0.203\\ 1.032\\ 0.196\\ 0.957\\ 0.830\\ 0.269\\ 0.343\\ 0.364 \end{array}$ | RSD
(%)
7.3
36.1
19.4
<i>64.6</i>
46.18
33.71
<i>27.7</i>
24.4 | Sensitivity
(cps/µgg ⁻¹)
91
6
109
16
126
105
20
50 | $\begin{array}{c} \text{DL} \\ (\mu \text{g g}^{-1}) \\ 0.008 \\ 0.554
\\ 0.004 \\ 0.352 \\ 0.022 \\ 0.006 \\ 0.231 \\ 0.026 \end{array}$ |
| RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.1 Cu 1.37 Zn 2.79
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7 | AV
(μgg ⁻¹)
1.91
3.61
0.77
0.98
0.81
0.69
1.10
1.74
2.24
 | $\begin{array}{c} \text{DIF} \\ (\mu_{\text{g} \text{g}}^{-1}) \\ 1.17 \\ 0.00 \\ 0.24 \\ 0.21 \\ 0.61 \\ 0.10 \\ 0.00 \\ 0.37 \\ 0.55 \end{array}$
 | 40 μm
DIF%
(%)
158
0.1
24.2
17.3
43
12.1
0
27.3
19.6 | $\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{g g}^{-1}) \\ 0.296 \\ 0.554 \\ 0.074 \\ 0.356 \\ 0.198 \\ 0.118 \\ 0.224 \\ 0.253 \\ 1.060 \end{array}$ | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
 | $\begin{array}{c} \text{Sensitivity} \\ (cps/\mu g g^{-1}) \\ 231 \\ 14 \\ 281 \\ 27 \\ 324 \\ 253 \\ 51 \\ 129 \\ 19 \end{array}$ | DL (μgg ⁻¹) 0.002 0.072 0.003 0.094 0.005 0.002 0.035 0.005 0.005 | AV (μgg ⁻¹) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.49 2.74 | DIF
(µgg ⁻¹)
2.03
0.75
0.00
0.29
0.38
0.01
0.14
0.12
0.05
 | 20 µm
DIF%
(%)
275
20.8
0.04
24
27
1.2
12
9
1.8 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\mathrm{gg}^{-1}) \\ 0.203 \\ 1.032 \\ 0.196 \\ 0.957 \\ 0.830 \\ 0.269 \\ 0.364 \\ 0.938 \end{array}$ | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2 | Sensitivity
(cps/ µ g g ⁻¹)
91
6
109
16
126
105
20
50
7 | DL
(µgg ⁻¹
)
0.008
0.554
0.004
0.352
0.022
0.006
0.231
0.026
0.431 |
| RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.1 Cu 1.37 Zn 2.79 Ga 1.31
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7 | AV
(μgg ⁻¹)
1.91
3.61
0.77
0.98
0.81
0.69
1.10
1.74
2.24
1.18
 | $\begin{array}{c} \text{DIF} \\ (\mu_{\text{g g}} \text{g}^{-1}) \\ 1.17 \\ 0.00 \\ 0.24 \\ 0.21 \\ 0.61 \\ 0.10 \\ 0.00 \\ 0.37 \\ 0.55 \\ 0.13 \end{array}$
 | 40 μ m DIF% (%) 158 0.1 24.2 17.3 43 12.1 0 27.3 19.6 10.0 | SD (1 σ)
(μg g ⁻¹)
0.296
0.554
0.074
0.356
0.198
0.118
0.224
0.253
1.060
0.190 | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
16.09
 | $\begin{array}{c} \text{Sensitivity} \\ (cps/\mu g g^{-1}) \\ 231 \\ 14 \\ 281 \\ 27 \\ 324 \\ 253 \\ 51 \\ 129 \\ 19 \\ 219 \end{array}$ | DL (μgg ⁻¹) 0.002 0.072 0.003 0.094 0.005 0.002 0.035 0.005 0.005 0.002 0.003 | AV (μgg ⁻¹) 2.77 2.86 1.01 1.48 0.80 1.24 2.74 1.32 | DIF
(µgg ⁻¹)
2.03
0.75
0.00
0.29
0.38
0.01
0.14
0.12
0.05
0.01
 | 20 µm
DIF%
(%)
275
20.8
0.04
27
1.2
7
1.2
9
1.8
1.1 | $\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu g g^{-1}) \\ 0.203 \\ 1.032 \\ 0.196 \\ 0.957 \\ 0.830 \\ 0.269 \\ 0.343 \\ 0.364 \\ 0.938 \\ 0.148 \end{array}$ | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2
11.2 | Sensitivity
(cps/ µgg ⁻¹)
91
6
109
<i>16</i>
126
126
105
<i>20</i>
50
7
88 | DL
(µgg ⁻¹
)
0.008
0.554
0.004
0.352
0.022
0.006
0.231
0.026
0.431
0.007 |
| RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.1 Cu 1.37 Zn 2.79 Ga 1.31 Ge 0.942
 | BG
(cps)
348
21.1
28.9
61.1
10.17
10.67
158
137
34.7
6.7
133 | AV
(µgg ⁻¹)
1.91
3.61
0.77
0.98
0.81
0.69
1.10
1.74
2.24
1.18
0.81
 | $\begin{array}{c} 0.00\\ \hline \\ \hline \\ \hline \\ \hline \\ \\ \hline \\ \\ \hline \\ \\ \\ \\ \\ $
 | 40 μm μm DIF% (%) 158 0.1 24.2 17.3 43 12.1 0 27.3 19.6 10.0 14 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mu_{gg}^{-1}) \\ 0.296 \\ 0.554 \\ 0.074 \\ 0.356 \\ 0.198 \\ 0.118 \\ 0.224 \\ 0.253 \\ 1.060 \\ 0.190 \\ 0.567 \end{array}$ | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
16.09
69.9
 | Sensitivity
(cps/μgg ⁻¹)
231
14
281
27
324
253
51
129
19
219
86 | DL (μgg ⁻¹) 0.002 0.072 0.003 0.094 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.003 0.003 0.003 | AV (μgg ⁻¹) 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.06 | DIF
(µgg ⁻¹)
2.03
0.75
0.00
0.38
0.01
0.12
0.01
0.12
 | 20 µm
DIF%
(%)
275
20.8
0.04
24
27
1.2
12
9
1.8
1.1
13 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\mathrm{gg}^{-1}) \\ 0.203 \\ 1.032 \\ 0.196 \\ 0.957 \\ 0.830 \\ 0.269 \\ 0.343 \\ 0.364 \\ 0.938 \\ 0.148 \\ 0.583 \end{array}$ | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2
11.2
54.9 | Sensitivity
(cps/µgg ⁻¹)
91
6
109
16
126
105
20
50
7
88
35 | DL
(µgg ⁻¹
)
0.008
0.054
0.004
0.352
0.022
0.006
0.231
0.026
0.431
0.026
0.431
0.007
0.168 |
| RV (µgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.1 Cu 1.37 Ga 1.31 Ge 0.74
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
80 | $\begin{array}{c} 0.83\\ \hline \\ \hline$
 | DIF
(μgg ⁻¹)
1.17
0.00
0.24
0.21
0.61
0.10
0.00
0.37
0.55
0.13
0.13
0.08
 | 40 μm μm DIF% (%) 158 0.1 24.2 17.3 43 12.1 0 27.3 19.6 10.0 14 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\text{g}\text{g}^{-1}) \\ 0.296 \\ 0.554 \\ 0.074 \\ 0.356 \\ 0.198 \\ 0.118 \\ 0.224 \\ 0.253 \\ 1.060 \\ 0.190 \\ 0.567 \\ 0.194 \end{array}$ | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
16.09
69.9
29.4
 | Sensitivity
(cps/µgg ⁻¹)
231
14
281
27
324
253
51
129
19
219
86
25 | DL (μgg ⁻¹) 0.002 0.072 0.003 0.094 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.090 0.003 0.037 0.039 | AV (μgg ⁻¹) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.49 2.74 1.32 1.06 0.71 | DIF
(µgg ⁻¹)
2.03
0.75
0.00
0.29
0.38
0.01
0.12
0.05
0.01
0.12
0.03
 | 20 µm
DIF%
(%)
275
20.8
0.04
24
27
1.2
12
9
1.8
1.1
13
4 | SD (1 σ)
(μgg ⁻¹)
0.203
1.032
0.196
0.957
0.830
0.269
0.343
0.364
0.938
0.148
0.583
0.372 | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2
54.9
52.6 | Sensitivity
(cps/µgg ⁻¹)
91
6
109
<i>16</i>
105
<i>20</i>
50
7
88
<i>35</i>
<i>10</i> | DL
(µgg ⁻¹)
0.008
0.554
0.004
0.352
0.002
0.002
0.231
0.026
0.431
0.026
0.431
0.007
0.168
 |
| RV (µgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.1 Cu 1.37 Zn 2.79 Ga 1.31 Ge 0.942 As 0.74 Pb 0.955
 | BG
(cps)
348
21.1
28.9
61.1
10.67
158
137
34.7
6.7
133
8.0
20.0 | AV (μgg ⁻¹) 3.61 0.77 0.98 0.81 0.69 1.10 1.74 2.24 1.18 0.81 0.69
 | DIF
(μgg ⁻¹)
1.17
0.00
0.24
0.21
0.10
0.00
0.37
0.55
0.13
0.13
0.13
0.01
 | 40 μm μm DIF% (%) 158 0.1 24.2 17.3 43 12.1 0 27.3 19.6 10.0 14 11.0 1.4 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mu g g^{-1}) \\ 0.296 \\ 0.554 \\ 0.074 \\ 0.356 \\ 0.118 \\ 0.224 \\ 0.253 \\ 1.060 \\ 0.190 \\ 0.567 \\ 0.194 \\ 0.075 \end{array}$ | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
16.09
69.9
29.4
 | Sensitivity
($(cps/\mu_g g^{-1})$)
231
14
281
27
324
253
51
129
19
219
86
25
201 | DL (μgg ⁻¹) 0.002 0.072 0.003 0.094 0.005 0.002 0.035 0.005 0.002 0.035 0.005 0.090 0.0035 0.090 0.0037 0.099 0.001 | AV (μgg ⁻¹) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.49 2.74 1.32 1.06 0.77 0.90 | DIF
(µgg ⁻¹)
2.03
0.75
0.00
0.38
0.01
0.14
0.12
0.01
0.12
0.01
0.12
0.05
 | 20 μm
DIF%
(%)
275
20.8
0.04
27
1.2
1.2
9
1.8
1.1
13
4
5 50 | $\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu g g^{-1}) \\ 0.203 \\ 1.032 \\ 0.196 \\ 0.957 \\ 0.830 \\ 0.269 \\ 0.364 \\ 0.938 \\ 0.148 \\ 0.583 \\ 0.372 \\ 0.101 \end{array}$ | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2
11.2
54.9
52.6
52.9
52.6 | Sensitivity
(cps/µgg ⁻¹)
91
6
109
16
126
105
20
50
7
88
35
10
111 | DL
(μgg ⁻¹
)
0.008
0.554
0.004
0.352
0.006
0.231
0.026
0.431
0.007
0.168
0.359
0.000 |
| $\begin{array}{c c} RV \\ (\mu g g^{-1}) \\ Sc & 0.74 \\ Ti & 3.61 \\ V & 1.01 \\ Cr & 1.19 \\ Mn & 1.42 \\ Co & 0.79 \\ Ni & 1.1 \\ Cu & 1.37 \\ Zn & 2.79 \\ Ga & 1.31 \\ Ge & 0.942 \\ As & 0.74 \\ Rb & 0.855 \\ Cs & 47.0 \\ Cs & 47.0 \\ Rb & 0.855 \\ Rb & 0.855 \\ Rb & 0.974 \\ Rb & 0.855 \\ Rb & 0.855 \\ Rb & 0.974 \\ Rb & $
 | BG
(cps)
348
21.1
28.9
61.1
1017
158
137
34.7
6.7
133
8.0
20.0
20.0 | AV
(µgg ⁻¹)
1.91
3.61
0.77
0.98
0.81
0.69
1.10
1.74
2.24
1.18
0.81
0.66
0.84
0.66
 | DIF
(μgg ⁻¹)
1.17
0.00
0.24
0.21
0.61
0.10
0.037
0.55
0.13
0.13
0.08
0.01 | 40 μm μm DIF% (%) 158 0.1 24.2 17.3 43 12.1 0 27.3 19.6 10.0 14 11.0 1.4 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mu_{gg}r^{(1)}) \\ 0.296 \\ 0.554 \\ 0.356 \\ 0.198 \\ 0.118 \\ 0.253 \\ 1.060 \\ 0.190 \\ 0.567 \\ 0.194 \\ 0.075 \\ 0.075 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\
0.001 \\ 0.001 $ | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
16.09
69.9
29.4
8.84 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | $\begin{array}{c} \begin{array}{c} \text{DL} \\ (\mu_{gg}^{-1}) \\ 0.002 \\ 0.072 \\ 0.003 \\ 0.094 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.003 \\ 0.037 \\ 0.099 \\ 0.001 \\ 0.001 \\ 0.001 \end{array}$
 | AV (μgg ⁻¹) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.49 2.74 1.32 1.06 0.71 0.90 | DIF
(µgg ⁻¹)
2.03
0.75
0.00
0.29
0.38
0.01
0.14
0.12
0.05
0.01
0.12
0.03
0.05 | 20 µm
DIF%
(%)
275
20.8
0.04
27
1.2
1.2
1.2
1.2
1.2
9
9
1.8
1.1
13
4
5.60
 | SD (1 σ)
(μg g ⁻¹)
0.203
1.032
0.957
0.830
0.2643
0.364
0.364
0.364
0.364
0.364
0.363
0.372
0.372
0.101 | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2
11.2
54.9
52.6
11.22 | Sensitivity
(cps/ µ g g ⁻¹)
91
6
109
16
126
105
20
50
7
7
88
35
35
10
111 | DL
(µgg ⁻¹)
0.008
0.554
0.004
0.352
0.006
0.231
0.026
0.4231
0.026
0.431
0.026
0.431
0.007
0.168
0.359
0.008
 |
| RV (µgg ⁻¹) Sc 0.74 Ti 3.61 V 1.19 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.1 Cu 1.37 Zn 2.79 Ga 1.31 Ge 0.942 As 0.74 Sr 45.8
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67 | κ μ μ μ μ
 | DIF
(<u>µ g g⁻¹</u>)
1.17
0.00
0.24
0.61
0.10
0.00
0.37
0.55
0.13
0.13
0.13
0.01
2.1
 | 40 μm μm DIF% (%) 158 0.1 24.2 17.3 17.3 43 12.1 0 27.3 19.6 10.0 14 11.0 1.4 4.67 1.4 | $\begin{array}{c} 0.000\\ \hline 0.000\\ \hline 0.296\\ 0.554\\ 0.074\\ 0.356\\ 0.198\\ 0.118\\ 0.224\\ 0.253\\ 1.060\\ 0.190\\ 0.567\\ 0.194\\ 0.075\\ 2.209\\ \hline 0.567\\ 0.194\\ 0.075\\ 0.567\\ 0.194\\ 0.075\\ 0.209\\ 0.567\\ 0.194\\ 0.075\\ 0.192\\ 0.000\\ 0.567\\ 0.194\\ 0.075\\ 0.192\\ 0.000\\ 0.567\\ 0.194\\ 0.075\\ 0.000\\ 0.0$ | RSD
(%)
15.53
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
16.09
69.9
29.4
8.84
5.06
 | Sensitivity (cps/μgg ⁻¹) 231 14 281 27 324 253 51 129 19 219 86 25 291 380 | DL (µgg ⁻¹) 0.002 0.072 0.094 0.005 0.005 0.005 0.003 0.003 0.003 0.003 0.003 0.003 0.001 | ΑV (μgg ⁻¹) 2.77 2.86 1.01 1.48 0.80 1.24 1.49 2.74 1.32 1.06 0.77 0.90 45.9 | DIF
(μgg ⁻¹)
2.03
0.75
0.00
<i>0.29</i>
0.38
0.01
<i>0.14</i>
0.02
0.01
<i>0.12</i>
<i>0.05</i>
0.01
<i>0.05</i>
0.01
 | 20 μm
DIF%
(%)
275
20.8
0.04
24
27
1.2
12
9
1.8
1.1
13
4
5.60
0.1 | SD (1 σ)
(μgg ⁻¹)
0.203
1.032
0.196
0.957
0.830
0.269
0.343
0.364
0.938
0.148
0.583
0.372
0.101
3.459
0.101
3.459 | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2
11.2
54.9
52.6
11.22
7.54 | Sensitivity
(cps/µgg ⁻¹)
91
6
109
16
105
20
50
7
8
8
8
35
10
111
147 | DL
(μgg ⁻¹
)
0.008
0.554
0.004
0.352
0.022
0.006
0.221
0.026
0.431
0.007
0.431
0.007
0.4359
0.008
0.002 |
| $\begin{array}{c c} RV \\ (\mu g g^{-1}) \\ Sc & 0.74 \\ Ti & 3.61 \\ V & 1.01 \\ Cr & 1.19 \\ Mn & 1.42 \\ Co & 0.79 \\ Ni & 1.1 \\ Cu & 1.37 \\ Ga & 1.31 \\ Ge & 0.942 \\ As & 0.74 \\ Rb & 0.855 \\ Sr & 45.8 \\ Y & 0.79 \end{array}$
 | BG
(cps)
348
21.1
28.9
61.1
1017
158
137
34.7
6.7
133
8.0
20.0
2.67
2.67 | $\begin{array}{c} 0.83\\ \hline \\ \hline$
 | DIF
(μgg ⁻¹)
1.17
0.00
0.24
0.21
0.61
0.10
0.00
0.37
0.55
0.13
0.08
0.01
2.1
0.13
 | 40 μ m DIF% (%) 158 0.1 24.2 17.3 12.1 0 27.3 19.6 10.0 14 11.0 1.4 4.67 16.7 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mugg^{-1}) \\ 0.296 \\ 0.554 \\ 0.356 \\ 0.198 \\ 0.118 \\ 0.224 \\ 0.253 \\ 1.060 \\ 0.567 \\ 0.194 \\ 0.75 \\ 2.209 \\ 0.066 \end{array}$ | RSD
(%)
15.53
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
16.09
69.9
29.4
8.84
5.06
7.16
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | DL (μgg ⁻¹) 0.002 0.073 0.094 0.002 0.035 0.003 0.099 0.003 0.099 0.001 0.002 | AV (μgg ⁻¹) 2.77 2.86 1.01 1.49 2.74 1.32 1.06 0.71 0.90 45.9 0.99 | DIF
(<u>µgg⁻¹</u>)
2.03
0.75
0.00
0.29
0.38
0.01
2.14
0.12
0.05
0.01
0.12
0.03
0.01
0.12
0.20
 | 20 μ m
DIF%
(%)
275
20.8
0.04
24
27
1.2
1.2
1.2
1.2
1.2
1.2
1.2
1.2
5.60
0.1
25.77 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mugg^{-1}) \\ 0.203 \\ 1.032 \\ 0.196 \\ 0.437 \\ 0.837 \\ 0.269 \\ 0.364 \\ 0.363 \\ 0.448 \\ 0.938 \\ 0.148 \\ 0.372 \\ 0.101 \\ 3.459 \\ 0.178 \end{array}$ | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2
11.2
54.9
52.6
11.22
7.54
17.9 | Sensitivity
(cps/ <u>µ g g</u> ⁻¹)
91
6
109
76
126
105
20
50
7
88
35
7
88
35
70
1111
147
144 | DL
(µgg ⁻¹)
0.008
0.554
0.002
0.002
0.022
0.002
0.231
0.026
0.431
0.007
0.168
0.359
0.008
0.002
 |
| RV (µgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.1 Cu 1.37 Zn 2.79 Ga 0.42 As 0.742 Sr 4585 Y 0.79 Zr 0.848
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6,7
133
8.0
20.0
2.67
2.67
0.00 | $\begin{array}{c} \hline 0.89 \\ \hline \hline \\ \hline $
 | DIF
(<u>µ g g⁻¹</u>)
1.17
0.00
0.24
0.61
0.10
0.00
0.37
0.55
0.13
0.03
0.13
0.01
2.1
0.17
 | 40 μm μm DIF% (%) 158 0.1 24.2 17.3 43 12.1 0 27.3 19.6 10.0 1.4 4.67 16.7 19.59 | $\begin{array}{c} 0.000\\ \hline 0.000$ | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
16.09
69.9
29.4
8.84
5.06
7.16
10.87 | Σεπsitivity (cps/μgg ⁻¹) 231 14 281 27 324 253 51 129 19 219 86 25 291 380 392 205 | μ | AV
 (μgg ⁻¹) 2.77 2.80 1.01 1.48 1.80 0.80 1.49 2.74 1.30 0.74 1.39 2.74 1.30 0.71 0.90 45.9 0.99 1.25 | DIF
(μgg ⁻¹)
2.03
0.75
0.00
<i>0.29</i>
0.38
0.01
<i>0.12</i>
<i>0.05</i>
0.01
<i>0.05</i>
0.1
<i>0.20</i>
0.05
0.1
0.20
0.40 | 20 μm
DIF%
(%)
275
20.8
0.04
24
27
1.2
12
9
1.8
1.1
13
4
5.60
0.1
25.77
47.73 | SD (1 σ)
(μg g ⁻¹)
0.203
1.032
0.196
0.343
0.364
0.343
0.364
0.383
0.372
0.148
0.583
0.372
0.101
3.459
0.171
 | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2
11.2
54.9
52.6
11.22
7.54
11.22
7.54
11.9
16.9 | Sensitivity
(cps/µgg ⁻¹)
6
109
16
126
105
20
50
7
88
35
10
111
147
144
76 | DL
(μgg ⁻¹)
0.008
0.554
0.022
0.022
0.026
0.231
0.026
0.431
0.007
0.168
0.359
0.008
0.002
0.005 |
| RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.11 Cu 1.37 Zr 2.79 Ga 1.31 Ge 0.942 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.848 Nb 0.824
 | BG
(cpp)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
2.67 | $\begin{array}{c} 0.83\\ \hline \\ \hline$
 | DIF
(<u>µ g g⁻¹</u>)
1.17
0.00
0.24
0.21
0.10
0.02
0.37
0.35
0.13
0.37
0.35
0.13
0.08
0.01
2.1
0.13
0.05
 | 40 μ m DIF% 58 0.1 24.2 17.3 43 12.1 0 27.3 19.6 10.0 14 11.0 4.67 16.7 19.69 6.62 6.62 | SD (1 σ) (μ g g ⁻¹) 0.296 0.554 0.074 0.356 0.198 0.118 0.224 0.253 0.660 0.190 0.567 0.194 0.075 2.209 0.066 0.110 0.110 0.108 | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
16.09
69.9
29.4
8.84
5.06
7.16
10.87
14.02
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | μ μ μ 0.002 0.072 0.003 0.094 0.005 0.005 0.005 0.005 0.003 0.033 0.030 0.030 0.031 0.039 0.001 0.002 0.001 | AV (µgg') 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.32 1.09 0.90 45.9 0.90 45.9 0.89 0.89 | DIF
(<u>µgg⁻¹</u>)
2.03
0.75
0.00
0.29
0.38
0.01
0.12
0.01
0.12
0.03
0.01
0.12
0.03
0.05
0.1
0.20
0.07
 | 20 μm
DIF%
(%)
275
20.8
0.04
24
27
1.2
72
9
9
1.8
1.1
73
4
5.60
0.1
25.77
47.73
8.30 | SD (1 σ)
(μgg ⁻¹)
0.203
1.032
0.196
0.830
0.269
0.364
0.363
0.364
0.363
0.364
0.363
0.364
0.372
0.101
3.459
0.178
0.2178 | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2
11.2
54.9
52.6
11.22
7.54
11.22
7.54
11.9
16.9
15.2 | Sensitivity
(<u>cps/µgg⁻¹)</u>
91
6
109
<i>16</i>
126
105
<i>20</i>
50
7
88
<i>35</i>
<i>70</i>
1111
147
144 | DL
(µgg ⁻¹)
0.008
0.554
0.022
0.006
0.231
0.026
0.431
0.007
0.168
0.359
0.008
0.002
0.002
0.005
0.015
 |
| RV (µ g g ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.1 Cu 1.37 Zn 2.79 Ga 0.43 Kb 0.855 Sr 458 Y 0.79 Zr 0.848 Nb 0.82 Ma 0.8
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
0.00
2.67
0.00
2.67 | λ λ μg g ⁻¹) 1.91 3.61 0.77 0.78 0.81 0.69 1.10 1.74 2.24 1.18 0.86 0.84 43.7 0.92 1.01 0.77 0.67
 | DIF
(µgg ⁻¹)
1.17
0.00
0.24
0.21
0.61
0.10
0.03
0.37
0.55
0.13
0.03
0.01
0.01
0.01
0.01
0.01
0.01
 | 40 μm μm DIF% (%) 158 0.1 24.2 17.3 43 12.1 0 27.3 19.6 10.0 14 11.0 1.4 4.67 19.59 6.62 18.5 | $\begin{array}{c} 0.000\\ \hline 0.000$ | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
16.09
29.4
8.84
5.06
7.16
10.87
14.02
20.7 | Σεπsitivity (cps/μgg ⁻¹) 231 14 281 27 324 253 51 129 19 219 86 251 380 392 205 393 74 | μ
 | AV
(<u>µgg⁻¹)</u>
2.77
2.87
1.01
1.49
2.74
1.80
0.80
1.24
1.49
2.74
1.32
1.06
0.71
0.90
45.9
0.99
1.25
0.83 | DIF
(µgg ⁻¹)
2.03
0.75
0.00
0.29
0.31
0.14
0.01
0.14
0.01
0.01
0.01
0.02
0.00
0.05
0.1
0.20
0.40
0.03 | 20 μm DIF% (%) 275 20.8 0.04 27 1.2 9 1.8 1.1 1.3 4 5.60 0.1 25.77 47.73 8.30 | $\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu g g^{-1}) \\ 0.203 \\ 1.032 \\ 0.1967 \\ 0.830 \\ 0.269 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.375 \\ 0.101 \\ 3.459 \\ 0.171 \\ 0.101 \\
3.459 \\ 0.1211 \\ 0.132 \\ 0.211 \\ 0.302 \\ $ | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2
54.9
52.6
11.22
7.54
17.9
16.9
15.2
7.55
16.9
15.2
36.5 | Sensitivity
(cps/µgg ⁻¹)
91
6
109
16
126
105
20
50
7
88
35
70
111
147
144
76
144
29 | DL
(µgg ⁻¹)
0.008
0.554
0.002
0.006
0.231
0.026
0.431
0.007
0.431
0.007
0.431
0.007
0.431
0.007
0.431
0.008
0.008
0.002
0.005
0.015
0.004 |
| RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Go 0.74 Mn 1.42 Co 0.79 Ni 1.11 Cu 1.37 Ga 1.31 Ge 0.942 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.848 Nb 0.824 Mo 0.8 Co 0.56
 | BG
(cpp)
348
21.1
28.9
61.1
1017
158
137
34.7
6.7
133
8.0
20.0
2.67
0.00
2.67
0.00
2.67
0.00
5.6 | $\begin{array}{c} 0.83\\ \hline \\ \hline$
 | DIF
(µgg ⁻¹)
1.17
0.00
0.24
0.21
0.61
0.10
0.00
0.37
0.55
0.13
0.08
0.01
2.1
0.13
0.08
0.01
2.1
0.13
0.05
0.13
0.05
0.10
 | 40 μ m DIF% (%) 158 0.1 24.2 17.3 43 12.1 0 27.3 19.6 10.0 14 11.0 1.4 4.67 16.7 19.59 6.62 16.5 117.64 16.5 | SD (1 σ) (μ g g ⁻¹) 0.296 0.554 0.074 0.356 0.198 0.118 0.224 0.253 0.660 0.190 0.567 0.194 0.075 2.209 0.066 0.110 0.108 0.138 | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
16.09
29.4
8.84
5.06
7.16
10.87
14.02
20.7
29.2
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | μ μ μ 0.002 0.072 0.003 0.094 0.005 0.005 0.005 0.005 0.003 0.033 0.005 0.003 0.033 0.030 0.030 0.031 0.032 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 | AV (µggl) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.32 1.09 0.90 45.9 0.90 45.9 0.89 0.89 0.83 0.55 | DIF
(µgg ⁻¹)
2.03
0.75
0.00
0.38
0.01
0.12
0.05
0.01
0.12
0.05
0.01
0.20
0.03
0.05
0.01
0.20
0.00
0.00
0.00
0.00
0.00
0.00
 | 20 μ m DIF% (%) 275 20.8 0.04 24 27 1.2 9 1.8 1.1 13 4 5.60 0.1 25.71 47.73 8.30 3.5 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mugg^{-1}\right)\\ 0.203\\ 1.032\\ 0.196\\$ | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2
11.2
54.9
52.6
11.22
7.54
11.22
7.54
11.22
7.54
11.22
7.54
11.52
36.5
57.4 | Sensitivity
(cps/ <u>µ g g</u> ⁻¹)
91
6
109
76
126
105
20
50
7
88
35
70
1111
147
144
29
9 | DL
(µgg ⁻¹)
0.008
0.554
0.004
0.352
0.006
0.231
0.006
0.431
0.007
0.168
0.359
0.008
0.002
0.005
0.005
0.005
0.004
0.004
0.004
 |
| $\begin{array}{c c} RV \\ (\mu_{R}g^{-1}) \\ Sc & 0.74 \\ Ti & 3.61 \\ V & 1.01 \\ Cr & 1.19 \\ Mn & 1.42 \\ Co & 0.79 \\ Ni & 1.1 \\ Cu & 1.37 \\ Zn & 2.79 \\ Ni & 1.1 \\ Ge & 0.942 \\ As & 0.74 \\ Rb & 0.855 \\ Sr & 45.8 \\ Y & 0.79 \\ Zr & 0.848 \\ Nb & 0.824 \\ Nb & 0.848 \\ Nb & 0.82 \\ Cd & 0.56 \\ Cd & 0.56 \end{array}$
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
0.00
2.67
0.00
2.67
0.00
2.67 | $\begin{array}{c} 0.89\\ \hline \\ \hline$
 | DIF
(μgg ⁻¹)
1.17
0.24
0.21
0.61
0.10
0.00
0.37
0.55
0.13
0.13
0.13
0.01
2.1
0.13
0.17
0.13
0.17
0.13
0.13
 | 40 μm μm DIF% (%) 158 0.1 24.2 17.3 43 12.1 0 27.3 43 12.1 0 27.3 43 12.1 0 27.3 43 12.1 0 27.5 10.0 1.4 4.6.7 19.59 6.62 17.64 | $\begin{array}{c} 0.000\\ \hline 0.000$ | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
16.09
69.9
29.4
8.84
5.06
7.16
10.87
14.02
20.7
38.3 | Σ for Sensitivity (cps/μgg ⁻¹) 231 14 281 27 324 253 51 129 19 219 86 251 380 392 205 393 74 17 | μ | AV
 (μgg ⁻¹) 2.77 2.78 1.01 1.48 1.80 0.80 1.24 1.32 1.32 1.32 1.36 0.90 45.9 0.90 45.9 0.83 0.56 | DIF
(µgg ⁻¹)
2.03
0.75
0.00
0.29
0.38
0.01
0.14
0.02
0.01
0.05
0.01
0.05
0.01
0.20
0.05
0.01
0.20
0.40
0.03
0.00
0.00 | 20 μm DIF% 0.5 275 20.8 0.04 27 12 9 1.8 1.1 1.3 4 5.60 0.1 25.77 47.73 8.30 3.5 0.5 | SD (1 σ)
(μg g ⁻¹)
0.203
1.032
0.1967
0.830
0.269
0.364
0.364
0.364
0.364
0.364
0.364
0.364
0.364
0.375
0.101
3.459
0.101
3.459
0.101
1.3459
0.211
0.211
0.302
0.323
 | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2
11.2
54.9
52.6
11.22
7.54
17.9
16.9
15.2
36.5
57.4 | Sensitivity
(cps/µgg ⁻¹)
91
6
109
16
126
105
20
50
7
7
88
35
10
111
147
144
76
144
29
8 | DL
(µgg ⁻¹)
0.008
0.554
0.004
0.352
0.006
0.231
0.026
0.431
0.007
0.431
0.007
0.4359
0.008
0.002
0.005
0.005
0.015
0.004 |
| RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.1 Cu 1.37 Zr9 Ga 1.31 Ge 0.942 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.848 Nb 0.824 Mo 0.8 Cd 0.56 Sn 1.68
 | BG
(cpp)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
0.00
2.67
0.00
5.8
58.7 | AV (µgg ⁻¹) 1.91 3.61 0.77 0.98 0.81 0.69 1.10 1.74 2.24 1.81 0.66 0.84 0.81 0.66 0.84 0.92 1.01 0.77 0.67 0.467 1.52
 | DIF (μgg ⁻¹) 1.17 0.00 0.24 0.21 0.61 0.00 0.37 0.55 0.13 0.03 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.16
 | 40 µm 40 µm DIF% (%) 158 0.1 24.2 17.3 43 12.1 0 27.3 19.6 10.0 14 11.0 1.4 6.62 16.5 17.64 9.76 | SD (1 σ) (μgg ⁻¹) 0.296 0.554 0.074 0.356 0.198 0.198 0.224 0.253 1.060 0.190 0.567 0.190 0.666 0.110 0.138 0.137 | RSD
(%)
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
16.09
69.9
29.4
8.84
5.06
7.16
10.87
14.02
20.7
14.02
20.5
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | μ μ μ g -1 0.002 0.072 0.003 0.075 0.005 0.005 0.005 0.033 0.005 0.039 0.003 0.039 0.003 0.039 0.003 0.039 0.003 0.039 0.004 0.002 0.001 0.012 0.005 0.005 | AV (µgg') 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.32 1.06 0.71 0.90 45.9 0.89 0.83 0.56 1.97 1.97 | DIF
(µgg ⁻¹)
2.03
0.75
0.00
0.38
0.01
0.12
0.03
0.01
0.12
0.01
0.12
0.01
0.12
0.01
0.01
 | 20 μm DIF% (%) 275 20.8 0.04 24 27 1.2 12 9 1.8 1.1 13 4 5.60 0.1 25.77 47.73 8.30 3.5 17.4 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mugg^{-1}\right)\\ 0.203\\ 1.032\\ 0.196\\$ | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2
11.2
54.9
52.6
11.22
7.54
17.9
16.9
15.2
36.5
57.4
24.91 | Sensitivity
(<u>cps/ µ g g⁻¹</u>)
91
6
109
<i>16</i>
126
105
<i>20</i>
50
7
88
<i>35</i>
<i>10</i>
1111
147
144
29
8
52 | DL
(µgg ⁻¹
)
0.008
0.554
0.004
0.352
0.006
0.231
0.026
0.431
0.007
0.006
0.359
0.002
0.005
0.002
0.005
0.005
0.004
0.633
0.004 |
| $\begin{array}{c c} RV \\ (\mu_{B}g^{-1}) \\ \hline \\ Sc & 0.74 \\ Ti & 3.61 \\ V & 1.01 \\ Cr & 1.19 \\ Mn & 1.42 \\ Co & 0.79 \\ Ni & 1.1 \\ Cu & 1.37 \\ Zn & 2.79 \\ Ni & 1.1 \\ Ge & 0.942 \\ As & 0.74 \\ Rb & 0.855 \\ Sr & 45.8 \\ V & 0.79 \\ Zr & 0.848 \\ Nb & 0.824 \\ Nb & 0.824 \\ Nb & 0.82 \\ Sr & 1.68 \\ Sb & 0.79 \end{array}$
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
2.67
0.00
2.67
0.00
2.67
0.00
5.8
58.7
5.3 | $\begin{array}{c} 0.89\\ \hline \\ \hline$
 | DIF (μgg ⁻¹) 1.17 0.24 0.21 0.61 0.10 0.037 0.37 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.14
 | 40 μ m DIF% (%) 158 0.1 124.2 17.3 12.1 0 27.3 12.1 0 27.3 19.6 10.0 14 4.67 16.7 19.59 6.62 16.5 17.64 9.76 8.36 16.5 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu_{Bg}^{-1})\\ 0.296\\ 0.554\\ 0.074\\ 0.356\\ 0.198\\ 0.118\\ 0.224\\ 0.253\\ 1.060\\ 0.190\\ 0.567\\ 0.190\\ 0.567\\ 0.190\\ 0.066\\ 0.110\\ 0.075\\ 2.209\\ 0.066\\ 0.110\\ 0.108\\ 0.177\\ 0.112\\ \end{array}$ | RSD
(%)
15.53
15.53
15.32
9.67
36.2
24.57
16.96
20.29
14.48
47.25
16.09
69.9
29.4
8.84
5.06
7.16
10.87
29.4
8.84
5.06
7.16
10.87
14.02
20.7
38.3
9.05
15.47
 | $\begin{array}{r} 2132\\ \hline \\ \hline$ | $\begin{array}{c} (\mu_{g} g^{-1}) \\ (\mu_{g} g^{-1}) \\ 0.002 \\ 0.072 \\ 0.003 \\ 0.094 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.004 \\ 0.001 \\ 0.004 \\ 0.001 \\ 0.004 \\ 0.001 \\ 0.004 \\ 0.001 \\ 0.004 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.006 \\ 0.006 \\ 0.006 \\ 0.000 \\ 0.000 \\ 0.000 \\ 0.006 \\ 0.000$ | AV (μgg ⁻¹) 2.77 2.86 1.01 1.48 1.80 0.80 1.21 1.49 2.74 1.32 1.06 0.70 45.9 0.90 45.9 0.83 0.56 1.97 | DIF
(<u>µgg⁻¹</u>)
2.03
0.75
0.00
<i>0.29</i>
0.38
0.01
<i>0.12</i>
0.03
0.01
<i>0.12</i>
0.01
<i>0.12</i>
0.01
0.01
0.01
0.05
0.1
0.20
0.40
0.03
0.00
0.29
0.19
 | 20 μm DIF% 0.04 275 20.8 0.04 24 27 1.2 12 12 13 4 5.60 0.1 25.77 47.73 8.30 3.5 0.5 17.4 23.56 | SD (1 σ)
(μg g ⁻¹)
0.203
1.032
0.196
0.830
0.269
0.364
0.364
0.364
0.364
0.364
0.364
0.372
0.101
3.459
0.101
3.459
0.101
3.459
0.101
0.211
0.302
0.302
0.323
0.491
0.225 | RSD
(%)
7.3
36.1
19.4
<i>64.6</i>
46.18
33.71
27.7
24.4
<i>34.2</i>
54.9
52.6
11.22
54.9
52.6
11.22
54.9
15.2
36.5
57.4
15.2
36.5
57.4
24.91
37.3 | Sensitivity
(cps/µgg ⁻¹)
91
6
109
16
126
105
20
50
7
7
88
35
10
111
147
144
76
144
29
8
52
60 | DL
(μgg ⁻¹)
0.008
0.554
0.004
0.352
0.002
0.022
0.006
0.231
0.026
0.431
0.007
0.168
0.002
0.005
0.008
0.002
0.005
0.0015
0.004
0.063
0.536
0.031
 |
| RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.1 Cu 1.37 Z.79 Ga 1.31 Ge 0.942 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.848 Nb 0.824 Mo 0.8 Cd 0.56 Sh 0.79 Cs 0.6644
 | BG
(cpp)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
0.00
2.67
0.00
2.67
0.00
5.8
58.7
5.3
177 | AV (µg g ⁻¹) 1.91 3.61 0.77 0.98 0.81 0.69 1.10 1.74 2.24 1.81 0.66 0.84 0.81 0.66 0.84 0.77 0.67 0.467 0.620 0.633
 | DIF (μgg ⁻¹) 1.17 0.00 0.24 0.21 0.61 0.00 0.37 0.55 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.16 0.07
 | 40 µm 40 µm DIF% (%) 158 0.1 24.2 17.3 43 12.1 0 27.3 19.6 10.0 14 11.0 4.67 16.7 19.59 6.62 16.54 9.76 8.36 4.4 | SD (1 σ) (μgg ⁻¹) 0.296 0.554 0.074 0.356 0.198 0.198 0.198 0.190 0.567 0.190 0.667 0.190 0.666 0.110 0.138 0.137 0.137 0.132 | RSD
(%)
15.53
15.53
15.52
24.57
16.96
20.29
14.48
47.25
16.09
29.4
8.84
47.25
5.06
69.9
29.4
8.84
5.06
10.87
14.02
29.4
8.84
5.06
15.57
14.02
20.7
38.3
9.05
15.47
30.64
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | μ μ μg -1 0.002 0.072 0.003 0.075 0.005 0.005 0.005 0.033 0.005 0.039 0.003 0.039 0.003 0.039 0.003 0.039 0.004 0.002 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.004 0.005 0.005 0.005 0.005 | AV (µgg') 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.32 1.06 0.90 45.9 0.90 45.9 0.89 0.83 0.56 1.97 0.63 | DIF (µg g ⁻¹) 2.03 0.75 0.00 0.75 0.03 0.75 0.03 0.75 0.03 0.75 0.01 0.12 0.03 0.01 0.12 0.03 0.01 0.20 0.41 0.20 0.41 0.20 0.41 0.20 0.41 0.20 0.41 0.20 0.41 0.20 0.41 0.20 0.41 0.20 0.41 0.22 0.42 0.43
 | 20 μm DIF% (%) 275 20.8 0.04 24 27 1.2 12 9 1.8 1.1 1.3 4 5.60 0.1 25.77 47.73 8.30 0.5 17.4 23.56 4.4 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mug\frac{g}{2}^{-1}\right)\\ 0.203\\ 1.032\\ 0.196\\095\\095\\096\\095\\096\\09$ | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
19.4
46.18
33.71
19.4
46.18
33.71
19.4
46.18
33.71
19.4
452.6
11.22
554.9
52.6
11.25
554.9
15.2
15.2
15.2
57.4
24.91
15.2
557.4
24.91
15.2
557.4
24.91
15.2
557.4
24.91
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557.4
24.91
15.2
557.4
24.91
15.2
557.4
24.91
15.2
557.4
24.91
15.2
557.4
24.91
15.2
557.4
24.91
15.2
15.2
15.2
15.2
15.2
15.2
15.2
15. | Sensitivity
(cps/ <u>µ g g</u> ⁻¹)
91
6
109
<i>16</i>
126
105
<i>20</i>
50
7
88
<i>35</i>
<i>10</i>
111
147
144
29
8
52
60
60
192 | DL
(µgg ⁻¹
)
0.008
0.554
0.004
0.352
0.004
0.221
0.006
0.231
0.007
0.007
0.007
0.005
0.002
0.005
0.005
0.004
0.633
0.536
0.004
0.536
0.012
0.031
0.016 |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
0.00
2.67
0.00
2.67
0.00
5.8
58.7
5.3
177
0.00 | $\begin{array}{c} 0.83\\ \hline \\ \hline$
 | DIF (μgg ⁻¹) 1.17 0.24 0.21 0.61 0.10 0.00 0.37 0.35 0.13 0.11 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.10 0.13 0.13 0.13 0.13 0.13 0.14
 | 40 µ 40 µ DIF% (%) 158 0.1 24.2 17.3 12.1 0 0 27.3 19.6 10.6 14 1.67 16.5 17.64 9.76 8.36 4.29 4.29 | $\begin{array}{c} 0.000\\ \hline 0.000$ | RSD
(%)
15.53
15.52
9.67
3.62
24.57
16.96
20.29
14.48
47.25
5.06
7.16
9.9
29.4
8.84
47.25
5.06
7.16
7.16
7.16
7.16
9.9
29.4
14.02
20.7
38.3
8.05
15.02
20.7
38.4
16.02
20.7
38.5
16.02
20.7
16.02
20.7
16.02
20.2
16.02
20.2
20.2
20.2
20.2
20.2
20.2
20.2 | Σεπsitivity (cps/μgg ⁻¹) 231 14 281 27 324 253 51 129 19 219 86 255 291 380 392 205 393 74 17 138 160 481 66 | μ |
$\begin{array}{c} \hline \\ \hline $ | DIF
(<u>µgg⁻¹</u>)
2.03
0.75
0.00
<i>0.29</i>
0.38
0.01
<i>0.12</i>
<i>0.01</i>
<i>0.12</i>
<i>0.01</i>
<i>0.12</i>
<i>0.01</i>
<i>0.12</i>
<i>0.01</i>
<i>0.12</i>
<i>0.05</i>
0.1
0.20
0.40
0.40
0.40
0.40
0.40
0.40
0.29
0.22 | 20 μm 20 μ DIF% (%) 275 20.8 0.04 24 27 1.2 1.2 1.2 1.2 1.3 4 5.60 0.1 25.77 47.73 8.30 0.5 17.4 23.56 4.4 6.9 | SD (1 σ)
(μg g ⁻¹)
0.203
1.032
0.967
0.830
0.269
0.343
0.364
0.364
0.364
0.364
0.364
0.364
0.365
0.312
0.101
3.459
0.101
3.459
0.101
0.211
0.135
0.302
0.323
0.323
0.491
0.325
0.324
0.325
 | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
34.2
54.9
52.6
11.22
54.9
52.6
11.22
54.9
16.9
16.9
16.2
36.5
57.4
17.5
4
17.5
4
37.3
36.5
57.4
11.2
2
36.5
57.4
11.2
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36.5
57.4
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37.3
37.3
11.2
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36.5
57.4
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36.5
37.1
12.2
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37.5
37.5
37.5 | Sensitivity
(cps/µgg ⁻¹)
91
6
109
16
126
105
20
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7
7
88
35
10
111
147
144
29
8
52
60
192
24 | DL
(μgg ⁻¹)
0.008
0.554
0.004
0.352
0.002
0.026
0.231
0.007
0.168
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0.00 |
| RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.11 Cu 1.37 Z.79 Ga 1.31 Ge 0.942 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.848 Nb 0.824 Mo 0.8 Cd 0.56 Sn 1.68 Sb 0.79 Cs 0.664 Ba 3.2 La 0.72
 | BG
(cpp)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
0.00
2.67
0.00
2.67
0.00
5.8
58.7
5.3
177
0.00
2.67 | $\begin{array}{c} 0.83\\ \hline \\ \hline$
 | DIF (μgg ⁻¹) 1.17 0.00 0.24 0.21 0.61 0.00 0.37 0.55 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.16 0.07 0.03 0.21
 | 40 μ m 40 μ m DIF% (%) 158 0.1 24.2 17.3 124.2 17.3 100 14 10.0 1.4 4.67 16.7 9.59 6.62 17.64 9.76 8.36 4.4 6.29 0.76 | SD (1 σ) (μgg ⁻¹) 0.296 0.554 0.074 0.356 0.198 0.118 0.223 1.060 0.190 0.567 0.190 0.666 0.110 0.138 0.137 0.137 0.139 0.192 | RSD
(%)
15.53
15.52
24.57
16.96
20.29
14.48
8.84
5.06
69.9
29.4
8.84
5.06
10.87
14.02
20.7
38.3
9.05
15.47
30.64
16.64
16.47
30.64
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | L μ μg g ⁻¹) 0.002 0.072 0.03 0.094 0.095 0.005 0.035 0.005 0.030 0.030 0.037 0.0390 0.001 0.002 0.004 0.002 0.004 0.001 0.012 0.005 0.006 0.005 0.006 0.005 0.006 0.005 0.006 | AV (µgg') 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.32 1.06 0.71 0.90 45.9 0.89 0.83 0.56 0.63 2.97 2.63 0.63 2.97 2.98 | DIF (µg g ⁻¹) 2.03 0.75 0.00 0.75 0.03 0.75 0.03 0.75 0.01 0.14 0.12 0.01 0.14 0.02 0.03 0.01 0.20 0.41 0.20 0.43 0.05 0.1 0.20 0.41 0.20 0.42 0.20 0.41 0.20 0.42 0.23 0.29 0.13 0.24
 | 20 μm 20 μ DIF% 275 20.8 0.04 24 1.2 12 9 1.8 1.1 13 4 5.60 0.1 25.77 47.73 8.30 3.5 17.4 23.66 4.4 6.9 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mugg^{-1}\right)\\ 0.203\\ 1.032\\ 0.196\\0957\\ 0.830\\ 0.269\\095\\ 0.343\\ 0.364\\0934\\ 0.364\\0934\\ 0.372\\ 0.101\\013\\ 0.372\\ 0.101\\013\\ 0.372\\ 0.101\\ 0.213\\ 0.323\\ 0.323\\ 0.323\\ 0.491\\ 0.225\\ 0.324\\ 0.382\\ 0.925\\ 0.324\\ 0.382\\ 0.925\\ 0.324\\ 0.382\\ 0.925\\ 0.324\\ 0.382\\ 0.925\\ 0.324\\ 0.382\\ 0.925\\ 0.324\\ 0.925\\ 0.324\\ 0.925\\ 0.324\\ 0.925\\ 0.92$ | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
22.7
24.4
54.9
52.6
11.22
7.54
11.22
7.54
11.22
7.54
11.22
36.5
55.7
4
24.91
37.3
37.3
37.1
24.91
15.2
55.1
11.20 | Sensitivity
(<u>cps/ µ g g⁻¹</u>)
91
6
109
<i>16</i>
126
105
<i>20</i>
50
7
88
<i>35</i>
<i>10</i>
111
147
144
29
8
52
60
192
24
192 | DL
(<u>µg g</u> ⁻¹
)
0.008
0.554
0.004
0.352
0.022
0.004
0.231
0.026
0.431
0.236
0.431
0.236
0.431
0.359
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0.00700000000 |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $
 | BG
(cps)
348
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
2.67
0.00
2.67
0.00
2.67
0.00
5.8
58.7
5.3
177
0.00
2.67 | $\begin{array}{c} 0.89\\ \hline \\ \hline$
 | DIF (μgg ⁻¹) 1.17 0.24 0.21 0.61 0.10 0.037 0.37 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.10 0.13 0.10 0.13 0.10 0.13 0.10 0.13 0.10 0.11 0.12
 | 40 µ 40 µ 0 µ 0 17.3 158 0.1 24.2 17.3 17.3 19.6 10.0 14 11.0 1.4 16.7 19.59 6.62 17.64 9.76 8.36 4.4 6.29 0.78 17.64 9.76 1.62 17.64 1.67 | SD (1 σ) (μ g g ⁻¹) 0.296 0.554 0.074 0.366 0.198 0.118 0.224 0.253 1.060 0.190 0.567 0.195 0.076 0.224 0.075 2.209 0.066 0.110 0.108 0.177 0.112 0.194 0.499 0.0560 | 8.52 (%) 15.53 15.52 9.67 36.2 24.57 16.96 20.29 14.48 47.25 16.09 69.9 29.4 5.06 7.16 10.87 14.42 20.7 38.54 5.06 7.16 16.64 7.80.64 16.64 7.80 7.80
 | Σ for Sensitivity (cps/μgg ⁻¹) 231 14 281 27 324 253 51 129 19 219 86 255 291 380 392 205 393 74 17 138 160 481 66 487 | μ | AV (μgg ⁻¹) 2.77 2.77 2.78 1.01 1.48 1.80 0.80 1.24 1.49 2.74 1.32 1.06 0.70 0.90 45.9 0.99 0.90 45.9 0.83 0.56 1.97 0.60 0.63 2.98 0.76 0.76 | DIF
(µgg ⁻¹)
2.03
0.75
0.00
<i>0.29</i>
0.38
0.01
<i>0.12</i>
0.03
0.01
<i>0.12</i>
0.01
<i>0.12</i>
0.01
<i>0.12</i>
0.01
<i>0.12</i>
0.01
0.05
0.11
0.05
0.40
0.05
0.40
0.03
0.029
0.19
0.022
0.04
0.05
 | 20 µm
DIF%
(%)
275
20.8
0.04
24
27
1.2
72
9
1.2
72
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1.2
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1.2
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1.2
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20.8
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7 | SD (1 σ)
(μg g ⁻¹)
0.203
1.032
0.196
0.830
0.269
0.364
0.364
0.364
0.364
0.364
0.364
0.364
0.364
0.372
0.101
3.459
0.101
3.459
0.101
0.302
0.302
0.302
0.302
0.323
0.491
0.225
0.324
0.225
0.324
0.225 | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
22.7
24.4
34.2
11.2
55.9
52.6
55.4
11.2
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55 | Sensitivity
(cps/µgg ⁻¹)
91
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109
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126
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111
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144
76
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192
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182 | DL
(μgg ⁻¹
)
0.008
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0.004
0.352
0.004
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0.231
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0.00 |
| $\begin{array}{c c} RV \\ (\mu_{gg}^{-1}) \\ Sc & 0.74 \\ Ti & 3.61 \\ V & 1.01 \\ Cr & 1.19 \\ Mn & 1.42 \\ Co & 0.79 \\ Ni & 1.1 \\ Cu & 1.37 \\ Cn & 2.79 \\ Ga & 1.31 \\ Ge & 0.942 \\ As & 0.74 \\ Rb & 0.855 \\ Sr & 45.8 \\ Y & 0.79 \\ Zr & 0.848 \\ Sh & 0.856 \\ Sr & 45.8 \\ Sh & 0.79 \\ Zr & 0.848 \\ Sh & 0.79 \\ Cd & 0.568 \\ Sh & 1.68 \\ Sh & 0.79 \\ Sh & 0.664 \\ Ba & 3.2 \\ La & 0.72 \\ Ce & 0.813 \\ \end{array}$
 | BG
(cpps)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
0.00
2.67
0.00
5.8
58.7
5.3
177
0.00
2.67
0.00 | $\begin{array}{c} 0.83\\ \hline \\ \hline$
 | DIF (μgg ⁻¹) 1.17 0.00 0.24 0.21 0.61 0.00 0.37 0.55 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.16 0.07 0.03 0.20 0.01 0.10
 | 40 μ m 40 μ m DIF% (%) 158 0.1 24.2 17.3 10 27.3 19.6 10.0 1.4 4.67 16.7 19.59 6.62 16.5 17.64 9.76 8.36 4.4 6.29 0.78 12.2 | SD (1 σ) (μgg ⁻¹) 0.296 0.554 0.74 0.356 0.198 0.118 0.224 0.253 1.060 0.198 0.190 0.564 0.190 0.566 0.110 0.108 0.138 0.177 0.137 0.137 0.137 0.199 0.566 0.100 | 8.52 RSD (%) 15.53 15.52 15.32 24.57 16.96 20.29 14.48 8.84 5.06 10.87 7.16 10.87 38.3 9.05 15.47 30.64 16.43 8.43
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | $\begin{array}{c} 0.000\\ \hline 0.000\\ \hline 0.002\\ 0.002\\ 0.003\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.001\\ 0.001\\ 0.002\\ 0.004\\ 0.001\\ 0.012\\ 0.005\\ 0.006\\ 0.001$ | AV (µggl) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.32 1.06 0.71 0.99 1.25 0.89 0.83 0.56 1.97 0.603 0.63 2.98 0.76 0.86 | DIF (µg g ⁻¹) 2.03 0.75 0.00 0.29 0.38 0.01 0.14 0.02 0.01 0.14 0.02 0.01 0.14 0.02 0.03 0.03 0.04 0.05
 | 20 µm
DIF%
(%)
215
215
20.8
0.04
24
27
1.2
9
.8
4
4
27
1.2
9
.8
5.60
0.1
1
3
4
4
4,7,73
8.30
0.5
17.4
23.56
0.5
17.4
4.4
6.2
6.2 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mug\frac{g^{-1}}{2}\right)\\ 0.203\\ 1.032\\ 0.196\\05\\ $ | RSD
(%)
7.3
36.1
19.4
64.6
46.18
33.71
27.7
24.4
54.9
52.6
11.22
7.54
11.22
7.54
9
15.2
57.4
13.0
51.1
13.0
51.1
13.168
11.68
11.69 | Sensitivity
(cps/ <u>µ g g</u> ⁻¹)
91
6
109
<i>16</i>
126
105
<i>20</i>
50
7
88
<i>35</i>
<i>10</i>
111
147
144
29
8
52
60
192
24
182
203 | DL (µgg^{-1}) 0.008 0.554 0.002 0.004 0.352 0.231 0.026 0.431 0.007 0.168 0.002 0.008 0.007 0.168 0.005 0.015 0.004 0.005 0.015 0.012
0.016 0.0037 0.002 |
| $\begin{array}{c c} RV \\ (\mu_{B,B}^{-1}) \\ \hline \\ Sc & 0.74 \\ Ti & 3.61 \\ V & 1.01 \\ Cr & 1.19 \\ Mn & 1.42 \\ Co & 0.79 \\ Ni & 1.1 \\ Cu & 1.37 \\ Zn & 2.79 \\ Ni & 1.1 \\ Ge & 0.942 \\ As & 0.74 \\ Rb & 0.855 \\ Sr & 45.8 \\ Nb & 0.824 \\ Nb & 0.824 \\ Nb & 0.824 \\ Mo & 0.8 \\ Cd & 0.56 \\ Sn & 1.68 \\ Sb & 0.79 \\ Cs & 0.681 \\ Ba & 3.2 \\ La & 0.72 \\ Ce & 0.813 \\ Pr & 0.768 \\ \end{array}$
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
2.67
0.00
2.67
0.00
5.8
58.7
5.3
177
0.00
2.67
0.00
2.67
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2.67
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0.00
0.00
0.00
0.00
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0.00
0 | $\begin{array}{c} 0.89\\ \hline \\ \hline$
 | DIF (μgg ⁻¹) 1.17 0.24 0.21 0.61 0.10 0.37 0.37 0.33 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.10 0.11 0.12 0.13 0.14
 | 40 μ m 40 μ m DIF% (%) 158 0.1 24.2 17.3 19.6 10.0 14 16.7 19.59 6.62 17.64 9.76 8.36 4.4 6.29 0.78 12.5.08 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mu_{Bg}^{-1}) \\ 0.296 \\ 0.554 \\ 0.074 \\ 0.356 \\ 0.198 \\ 0.118 \\ 0.224 \\ 0.253 \\ 1.060 \\ 0.223 \\ 1.060 \\ 0.190 \\ 0.567 \\ 0.194 \\ 0.075 \\ 2.209 \\ 0.667 \\ 0.110 \\ 0.075 \\ 2.209 \\ 0.667 \\ 0.110 \\ 0.075 \\ 0.112 \\ 0.112 \\ 0.112 \\ 0.112 \\ 0.194 \\ 0.499 \\ 0.056 \\ 0.060 \\ 0.063 \\ \end{array}$ | RSD
(%)
15.532
9.67
36.2
24.57
16.96
20.29
24.57
16.96
20.29
24.57
16.96
20.29
29.4
8.84
47.25
5.06
7.16
8.84
10.87
7.30.3
8.84
 | $\begin{array}{r} 2132\\ \hline \\ \hline$ | $\begin{array}{c} 0.000\\ \hline 0.000\\ \mu_{gg}^{-1} \\ 0.002\\ 0.072\\ 0.003\\ 0.094\\ 0.005\\ 0.002\\ 0.005\\ 0.002\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.006\\ 0.006\\ 0.001\\$ | AV (µg g ⁻¹) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.06 0.71 2.76 2.80 1.49 2.74 1.32 1.06 0.71 0.90 45.9 0.90 45.9 0.83 0.56 1.97 0.60 0.63 2.98 0.76 0.86 | DIF
(<u>µgg⁻¹</u>)
2.03
0.75
0.00
<i>0.29</i>
0.38
0.01
<i>0.12</i>
0.03
<i>0.14</i>
0.01
<i>0.12</i>
0.01
<i>0.12</i>
0.01
<i>0.12</i>
0.03
0.05
0.01
0.05
0.05
0.00
0.40
0.05
0.40
0.02
0.03
0.20
0.20
0.20
0.20
0.20
0.2
 | 20 µm
DIF%
(%)
275
275
275
275
275
275
27
20.8
0.04
24
24
27
1.2
7
1.2
7
9
7.8
1.1
1.3
4
5.60
0.1
1.4
5.57
5.05
5.55
0.5
5.05
8.30
6.2
23.56
8.30
8.40
8.40
8.50
7.5
9
7.5
7.5
7.5
7.5
7.5
7.5
7.5
7.5
7.5
7.5 | SD (1 σ)
(μg g ⁻¹)
0.203
1.032
0.196
<i>0.957</i>
0.830
0.269
<i>0.364</i>
0.364
<i>0.343</i>
0.364
<i>0.343</i>
0.364
<i>0.348</i>
0.101
3.459
0.101
3.459
0.101
0.302
0.302
0.302
0.323
0.491
0.225
0.324
0.387
0.387
0.387
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0.395
0.395
0.395
0.395
0.395
0.395
0.395
0.395
0.395
0.395 | RSD
(%)
7.3
36.1
19.4
<i>04.6</i>
33.71
<i>27.7</i>
11.2
24.4
34.2
11.2
24.4
34.2
11.2
24.4
17.9
16.9
15.2
36.5
57.4
24.91
37.3
51.1
13.0
11.68 | Sensitivity
(cps/ µ g g ⁻¹)
91
6
109
126
105
20
50
7
7
88
35
70
111
147
144
29
8
52
60
192
24
182
203
228 | DL (μgg ⁻¹) 0.008 0.554 0.004 0.352 0.004 0.352 0.004 0.352 0.004 0.352 0.006 0.231 0.007
 0.663 0.015 0.031 0.037 0.003 0.002 |
| RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Go 0.74 Ti 3.61 V 1.01 Go 0.74 Mn 1.42 Co 0.79 Ni 1.11 Cu 1.37 Zr 0.648 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.648 Nb 0.824 Mo 0.8 Cd 0.56 Sn 1.68 Sb 0.79 Cs 0.664 Ba 3.2 La 0.72 Ce 0.813 Pr 0.768 Nd 0.752
 | BG
(cpp)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
0.00
2.67
0.00
5.8
58.7
5.3
177
0.00
2.67
0.00
2.67
0.00
2.67 | $\begin{array}{c} 0.83\\ \hline \\ \hline$
 | DIF (μgg ⁻¹) 1.17 0.00 0.24 0.21 0.61 0.00 0.37 0.55 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.16 0.07 0.03 0.20 0.11 0.12
 | 40 μ m 40 μ m DIF% (%) 158 0.1 24.2 17.3 12.4 17.3 19.6 10.0 1.4 4.67 16.7 9.59 6.62 17.64 9.76 8.36 4.4 6.29 0.78 10.75 | SD (1 σ) (μgg ⁻¹) 0.296 0.554 0.74 0.356 0.198 0.118 0.224 0.253 1.060 0.198 0.190 0.567 0.190 0.566 0.110 0.138 0.137 0.137 0.137 0.130 0.660 0.663 | RSD
(%)
15.532
9.67
36.2
20.29
20.29
20.29
20.29
20.29
20.29
20.4
4
7.26
6
09.9
29.4
5.06
7.16
60.9
29.4
5.06
7.16
10.87
10.87
10.87
10.87
10.87
10.87
10.87
10.87
10.88
38.3
8.84
8.84
8.84
8.84
8.84
8.84
8
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | $\begin{array}{c} 0.000\\ \hline 0.000\\ \hline 0.002\\ 0.002\\ 0.003\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.003\\ 0.005\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.001\\ 0.002\\ 0.004\\ 0.001\\ 0.012\\ 0.005\\ 0.006\\ 0.001\\ 0.001\\ 0.005\\ 0.006\\ 0.001\\ 0.005\\ 0.006\\ 0.001\\ 0.005\\ 0.006\\ 0.001\\ 0.005\\ 0.006\\ 0.001\\ 0.005$ | AV (µgg') 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.32 1.06 0.71 0.90 45.9 0.89 0.83 0.56 1.97 0.603 2.98 0.72 | DIF (µg g ⁻¹) 2.03 0.75 0.00 0.75 0.03 0.75 0.01 0.14 0.12 0.01 0.12 0.03 0.01 0.14 0.02 0.03 0.03 0.04 0.04
 | 20 µm
DIF%
(%)
275
20.8
0.04
27
1.2
20.8
0.04
27
1.2
7
9
1.8
1.1
7
3
5.60
0.1
25.77
4.7.3
0.5
17.4
4.30,5
17.4
23.56
6.2
12.2
4.46 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mug\frac{g^{-1}}{2}\right)\\ 0.203\\ 1.032\\ 0.196\\052\\05$ | RSD
(%)
7.3
36.1
19.4
64.6
44.6
44.6
33.71
27.7
24.4
34.2
54.9
52.6
52.6
52.6
52.6
11.22
7.54
11.22
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7.54
7.54
7.54
7.54
7.54
7.54 | Sensitivity
(cps/ µ g g ⁻¹)
91
6
109
76
126
105
20
50
7
88
35
70
111
111
147
144
29
8
52
60
192
24
182
203
228
40 | DL (µgg ⁻¹) 0.008 0.554 0.002 0.004 0.352 0.231 0.026 0.431 0.007 0.168 0.002 0.006 0.015
 0.005 0.015 0.016 0.037 0.002 0.003 0.004 |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
80
20.0
2.67
2.67
0.00
2.67
0.00
5.8
58.7
5.3
177
0.00
2.67
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0.00
0.00
0.00
0 | $\begin{array}{c} 0.89\\ \hline \\ \hline$
 | DIF (μgg ⁻¹) 1.17 0.24 0.21 0.61 0.10 0.37 0.35 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.10 0.11
 | 40 µ m 40 µ m DIF% (%) 158 0.1 24.2 17.3 19.6 27.3 19.6 10.0 14 11.0 1.4 4.67 19.59 6.62 17.64 9.76 8.36 4.4 6.29 0.78 12.5.08 10.75 14 0 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu_{Bg}^{-1})\\ 0.296\\ 0.554\\ 0.074\\ 0.356\\ 0.198\\ 0.118\\ 0.224\\ 0.253\\ 1.060\\ 0.198\\ 0.223\\ 1.060\\ 0.198\\ 0.223\\ 1.060\\ 0.108\\ 0.138\\ 0.175\\ 2.209\\ 0.066\\ 0.110\\ 0.075\\ 2.209\\ 0.066\\ 0.110\\ 0.108\\ 0.138\\ 0.177\\ 0.112\\ 0.194\\ 0.056\\ 0.063\\ 0.035\\ 0.198\\ 0.063\\ 0.035\\ 0.198\\ 0.108\\ 0.108\\ 0.0063\\ 0.035\\ 0.108\\ 0.108\\ 0.108\\ 0.108\\ 0.0063\\ 0.035\\ 0.108\\ 0.108\\ 0.108\\ 0.0063\\ 0.035\\ 0.108\\ 0.108\\ 0.108\\ 0.005\\ 0.003$ | RSD
(%)
15.532
9.67
36.2
24.57
16.96
20.29
24.57
16.96
20.29
24.57
16.96
20.29
29.4
47.25
5.06
7.16
8.84
47.25
5.06
7.16
8.84
30.05
15.47
30.64
7.80
8.43
8.43
8.44
4.22
23.0
 | $\begin{array}{r} 2132\\ \hline \\ \hline$ | μ | AV (µg g ⁻¹) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.06 0.70 2.75 0.80 1.24 1.32 1.06 0.70 0.90 45.9 0.90 45.9 0.83 0.56 1.97 0.60 0.63 2.98 0.76 0.866 0.72 | DIF
(<u>µgg⁻¹</u>)
2.03
0.75
0.00
<i>0.29</i>
0.38
0.01
<i>0.12</i>
0.03
0.01
<i>0.12</i>
0.01
<i>0.12</i>
0.01
<i>0.12</i>
0.01
0.05
0.01
0.05
0.05
0.05
0.05
0.00
0.40
0.05
0.20
0.03
0.02
0.03
0.02
0.03
0.02
0.04
0.02
0.09
0.04
0.09
0.14
 | 20 µm
DIF%
(%)
275
275
275
275
275
275
27
20.8
0.04
24
27
1.2
27
1.2
7
9
7.8
1.1
1.3
4
5.60
0.1
1.4
5.57
7
47,73
8.30
0.5
17.4
4
8.35
6.2
12.2
4.865
17.4
8.35
8.35
8.35
8.35
8.35
8.35
8.35
8.35 | SD (1 σ)
(μg g ⁻¹)
0.203
1.032
0.196
<i>0.957</i>
0.830
0.364
<i>0.343</i>
0.364
<i>0.343</i>
0.364
<i>0.343</i>
0.364
<i>0.343</i>
0.364
<i>0.345</i>
0.101
3.459
0.101
3.459
0.101
3.459
0.211
0.302
0.302
0.323
0.491
0.225
0.324
0.387
0.387
0.387
0.387
0.387
0.387
0.215
0.215 | RSD
(%)
7.3
36.1
19.4
<i>04.6</i>
33.71
<i>27.7</i>
11.2
27.4
<i>34.2</i>
52.6
11.22
7.54
17.9
16.9
15.2
36.5
57.4
24.91
37.3
51.1
13.0
11.68
11.97
16.4
11.97 | Sensitivity
(cps/ µ g g ⁻¹)
91
6
109
18
126
105
20
50
7
7
88
35
70
111
147
144
76
144
29
8
52
60
192
24
182
203
228
40
31 | DL (μgg ⁻¹) 0.008 0.554 0.004 0.352 0.004 0.3231 0.026 0.021 0.007 0.68 0.007 0.08 0.005
 0.015 0.005 0.015 0.0063 0.031 0.037 0.003 0.003 0.004 |
| RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.11 Cu 1.37 Zr9 Ga 1.31 Ge 0.942 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.848 Sh 0.72 Cd 0.56 Sh 1.68 Sb 0.79 Cs 0.664 Ba 3.2 La 0.72 Ce 0.813 Pr 0.768 Sh 0.752 Sm 0.752
 | BG
(cpp)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
0.00
2.67
0.00
5.8
58.7
5.3
177
0.00
2.67
0.00
2.67
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2.67
0.00
2.67
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0.00
0.00
0.00
0.00
0 | $\begin{array}{c} 0.83\\ \hline \\ \hline$
 | DIF (μgg ⁻¹) 1.17 0.00 0.24 0.21 0.61 0.00 0.37 0.55 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.16 0.07 0.03 0.10 0.16 0.07 0.03 0.20 0.01 0.04 0.08 0.01 0.04 0.08 0.11 0.20
 | 40 μ m 40 μ m DIF% (%) 158 0.1 24.2 17.3 10 27.3 19.6 10.1 14.4 467 16.7 19.59 6.62 16.5 17.64 9.76 8.36 4.4 6.78 12.2 5.08 10.75 14.4 | SD (1 σ) (μgg ⁻¹) 0.296 0.554 0.74 0.356 0.198 0.118 0.223 0.600 0.190 0.554 0.74 0.356 0.198 0.118 0.224 0.253 0.660 0.194 0.75 2.209 0.666 0.108 0.138 0.177 0.137 0.138 0.177 0.138 0.177 0.138 0.177 0.138 0.177 0.138 0.660 0.0663 0.0663 0.078 0.780 | RSD
(%)
15.532
9.67
36.2
20.29
9.67
36.2
20.29
14.48
47.25
69.9
29.4
47.25
8.84
47.25
8.84
47.25
8.84
16.69
8.83
8.84
8.84
4.2
23.00
8.43
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | $\begin{array}{c} 0.000\\ \hline 0.000\\ \mu g \ g^{-1} \\ 0.002\\ 0.072\\ 0.003\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.001\\ 0.001\\ 0.002\\ 0.004\\ 0.001\\ 0.012\\ 0.005\\ 0.006\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.005\\ 0.006\\ 0.001\\ 0.005\\$ | AV (µgg1) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.32 1.06 0.71 0.90 0.59 0.89 0.83 0.56 1.97 0.603 0.63 2.98 0.72 0.86 0.72 0.89 | DIF (µg,g^-1) 2.03 0.75 0.00 0.29 0.38 0.01 0.14 0.02 0.01 0.14 0.02 0.01 0.14 0.02 0.03 0.04 0.04 0.04 0.05
 | 20 µm
DIF%
(%)
275
20.8
0.04
27
1.2
20.8
0.04
27
1.2
7
9
7.8
1.1
7
3
5
6
0.1
25.77
3.8
1.1
7
4
7.73
8.30
3.5
0.5
17.4
4.23.56
6.2
4.486
8.205
8.2
27
5
20.5
20.5
20.5
20.5
20.5
20.5
20.5
20 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mug\frac{g^{-1}}{2}\right)\\ 0.203\\ 1.032\\ 0.196\\ .0.957\\ 0.830\\ 0.269\\ 0.343\\ 0.364\\ .0.938\\ 0.148\\ .0.938\\ 0.148\\ .0.938\\ 0.148\\ .0.938\\ 0.148\\ .0.938\\ 0.148\\ .0.938\\ .0.178\\ 0.212\\ 0.101\\ .0.135\\ 0.323\\ 0.323\\ 0.491\\ 0.225\\ 0.324\\ 0.387\\ 0.089\\ 0.103\\ 0.142\\ 0.387\\ 0.089\\ 0.089\\ 0.103\\ 0.142\\ 0.387\\ 0.089\\ 0.103\\ 0.142\\ 0.088\\ 0.103\\ 0.142\\ 0.088\\ 0.103\\ 0.142$ | RSD
(%)
7.3
36.1
19.4
64.6
44.6
18
33.71
12.2
7.54
9
52.6
52.6
52.6
52.6
52.6
52.6
52.7
7.54
11.2
54.9
52.6
55.7,4
12.2
7.54
11.2
2
55.4
11.2
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55.4
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51.1
11.2
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57.4
51.1
11.2
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57.7
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52.6
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5
5
5 | Sensitivity
(cps/ µ g g ⁻¹)
91
6
109
126
126
20
50
7
88
35
70
111
147
144
29
8
52
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192
24
182
203
228
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192
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182
203
228
40
31
124 | DL (µ g g -1) 0.008 0.554 0.002 0.002 0.002 0.002 0.006 0.231 0.026 0.431 0.007 0.168
 0.0026 0.431 0.002 0.008 0.005 0.015 0.004 0.005 0.015 0.012 0.016 0.037 0.002 0.003 0.040 0.040 |
| B 0.0223 RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ri 2.79 Ga 1.31 Ge 0.942 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.844 Mo 0.8 Cd 0.56 Sn 1.68 Sb 0.79 Ce 0.813 Pr 0.768 Nd 0.754 Eu 0.77
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
80
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5.8
58.7
5.3
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0 | $\begin{array}{c} 0.89\\ \hline \\ \hline$
 | DIF (μgg ⁻¹) 1.17 0.24 0.21 0.61 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.14 0.15 0.13 0.14 0.15 0.13 0.14 0.07 0.03 0.01 0.16 0.07 0.03 0.01 0.13 0.14 0.05
 | 40 µ m 40 µ m DIF% (%) 158 0.1 24.2 17.3 19.6 027.3 19.6 10.0 14 11.0 14.4 15.7 16.5 17.64 9.76 8.36 4.4 6.29 0.78 12.5.08 10.75 14.0 14.15 | SD (1 σ) (μgg ⁻¹) 0.296 0.554 0.074 0.398 0.198 0.198 0.223 1.060 0.198 0.253 1.060 0.198 0.253 1.060 0.190 0.567 0.194 0.075 2.209 0.666 0.110 0.138 0.137 0.138 0.137 0.138 0.137 0.138 0.137 0.112 0.949 0.056 0.198 0.063 0.035 0.198 0.899 | RSD
(%)
15.532
9.67
15.32
24.57
16.96
69.9
29.4
4.725
20.29
14.48
4.725
20.29
14.48
4.725
20.29
14.48
5.06
69.9
29.4
8.84
5.06
8.84
7.16
6.9
9.05
15.47
30.62
20.7
16.44
7.80
8.84
4.220.7
16.64
7.80
8.84
4.200
7.16
6.43
8.84
4.200
7.10
7.16
7.10
7.10
7.10
7.10
7.10
7.10
7.10
7.10
 | $\begin{array}{r} 2132\\ \hline \\ \hline$ | $\begin{array}{c} (\mu g g^{-1}) \\ (\mu g g^{-1}) \\ 0.002 \\ 0.072 \\ 0.002 \\ 0.072 \\ 0.003 \\ 0.094 \\ 0.005 \\ 0.002 \\ 0.005 \\ 0.002 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0$ | AV (µgg ⁻¹) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.06 0.70 2.75 0.80 1.24 1.32 1.06 0.70 0.90 45.9 0.90 45.9 0.83 0.56 1.97 0.60 0.83 0.76 0.86 0.72 0.89 0.83 0.86 0.72 0.89 0.83 | DIF (µgg ⁻¹) 2.03 0.75 0.00 <i>a.29</i> 0.12 <i>a.14</i> 0.12 <i>a.03</i> 0.01 <i>a.14</i> 0.12 <i>a.03</i> 0.01 <i>a.12 a.03</i> 0.05 0.11 <i>a.12 a.03</i> 0.05 0.11 0.20 0.40 0.07 0.03 0.03 0.040 0.07 0.03 0.040 0.05 0.19 0.03 0.04 0.05 0.04 0.05 0.04 0.05 0.04 0.05 0.04 0.05 0.04 0.05
 | 20 µm
DIF%
(%)
275
275
275
275
275
275
27
20.8
0.04
24
27
1.2
27
1.2
7
9
7.8
1.1
1.3
4
5.60
0.1
1.4
5.50
0.17.4
47.73
8.30
6.2
12.2
4.865
6.2
12.2
8.35
6.2
12.2
8.35
6.2
12.2
8.35
6.2
12.2
8.35
6.2
8.35
8.35
8.35
8.35
8.35
8.35
8.35
8.35 | $\begin{array}{c} & \text{SD} \left(1\sigma\right) \\ (\mugg^{-1}) \\ 0.203 \\ 1.032 \\ 0.196 \\ 0.830 \\ 0.269 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.372 \\ 0.101 \\ 0.315 \\ 0.211 \\ 0.302 \\ 0.323 \\ 0.491 \\ 0.302 \\ 0.323 \\ 0.491 \\ 0.387 $ | RSD
(%)
7.3
36.1
19.4
46.6
46.6
46.18
33.71
11.2
54.9
11.2
54.9
11.2
54.9
15.2
36.5
57.4
11.2
15.2
36.5
57.4
37.3
51.1
11.6
4
11.9
15.2
37.3
51.1
11.9
15.2
37.3
37.3
37.3
37.3
37.3
37.3
37.3
37 | Sensitivity
(cps/ µ g g ⁻¹)
91
6
109
16
126
105
20
50
7
7
88
35
70
111
144
76
144
29
8
52
60
192
24
182
203
228
40
31
124 | DL (μgg ⁻¹) 0.008 0.554 0.004 0.554 0.004 0.352 0.002 0.0231 0.026 0.431 0.007 0.68 0.005
0.015 0.005 0.015 0.0063 0.031 0.037 0.003 0.003 0.040 0.040 |
| RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Ni 1.11 Cu 1.37 Zr 0.64 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.848 Nb 0.824 Mo 0.8 Cd 0.56 Sn 1.68 Sb 0.79 Cs 0.664 Ba 3.2 La 0.72 Ce 0.813 Pr 0.768 Sm 0.754 Eu 0.774 Gd 0.763
 | BG
(cpp)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
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20.0
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0 | $\begin{array}{c} 0.83\\ \hline \\ \hline$
 | DIF (μgg ⁻¹) 1.17 0.00 0.24 0.21 0.37 0.55 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.16 0.07 0.01 0.10 0.04 0.11 0.03 0.01 0.04 0.11 0.03 0.09
 | 40 μ m 40 μ m DIF% (%) 158 0.1 24.2 17.3 124.2 17.3 19.6 10.0 1.4 4.67 16.7 9.59 6.62 16.64 9.76 8.36 4.4 6.29 0.78 10.75 14.0 4.18 11.52 | $\begin{array}{c} 0.000\\ \hline 0.000$ | RSD
(%)
15.53
15.53
9.67
16.96
20.29
14.48
5.06
9.97
14.02
29.4
8.84
8.84
8.84
16.64
7.80
30.64
16.64
7.80
11.1
226.58 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | $\begin{array}{c} \begin{array}{c} (\mu g \ g^{-1}) \\ (\mu g \ g^{-1}) \\ 0.002 \\ 0.072 \\ 0.003 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.002 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.008 \\ 0.005 \\ $ | AV (µgg') 2.77 2.86 1.01 1.48
1.80 0.80 1.24 1.32 1.32 1.06 0.71 0.90 45.9 0.89 0.83 0.56 0.63 2.98 0.72 0.89 0.86 0.72 0.89 0.83 0.72 0.89 0.86 0.72 0.89 0.83 | DIF (µg g g ⁻¹) 2.03 0.75 0.00 0.75 0.03 0.75 0.01 0.14 0.02 0.01 0.12 0.03 0.01 0.14 0.20 0.41 0.05 0.04 0.22 | 20 µm
DIF%
(%)
275
20.8
0.04
27
1.2
20.8
0.04
27
1.2
7
9
7.8
1.1
7
25.77
4.73
4.5
60
0.1
25.773
4.30,05
17.4
23.56
6.2
12.2,26
8.3
23.60 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mug\frac{g^{-1}}{g}\right)\\ 0.203\\ 1.032\\
0.196\\05\\ $ | RSD
(%)
7.3
36.1
19.4
46.18
33.71
27.7
24.4
46.18
33.71
27.7
24.4
54.9
52.6
11.22
54.9
52.6
11.22
54.9
15.2
36.5
57.4
24.91
37.3
8.5
57.4
24.91
15.2
36.5
11.12
24.2
11.2
11.2
11.2
11.2
11.2
11. | Sensitivity
(cps/ µ g g ⁻¹)
91
6
109
76
126
105
20
50
7
88
35
70
111
147
144
29
8
52
60
192
24
182
203
228
60
192
24
182
203
228
40
31
124
31 | DL (µ g g -1) 0.008 0.554 0.002 0.002 0.002 0.002 0.002 0.002 0.006 0.231 0.026 0.431 0.007 0.168 0.002 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.015 0.004 0.003 0.002 0.003 0.040 0.0040 0.025 |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $
 | BG
(cps)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
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0.00
2.67
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5.8
58.7
5.3
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2.67 | $\begin{array}{c} 0.89\\ \hline \\ \hline$
 | DIF
(µgg ⁻¹)
1.17
0.24
0.21
0.61
0.10
0.03
0.37
0.55
0.13
0.13
0.13
0.13
0.13
0.13
0.13
0.13
 | 40 µ m 40 µ m DIF% (%) 158 0.1 24.2 17.3 19.6 027.3 19.6 10.0 14 10.0 14 10.0 14 15.7 18.5 17.64 9.76 8.36 4.4 6.29 0.78 12.5.08 10.75 14.0 4.18 11.52 20.92 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mu_{\text{K}\text{K}}^{-1}) \\ 0.296 \\ 0.554 \\ 0.074 \\ 0.356 \\ 0.198 \\ 0.118 \\ 0.224 \\ 0.253 \\ 1.060 \\ 0.194 \\ 0.253 \\ 1.060 \\ 0.194 \\ 0.253 \\ 1.060 \\ 0.194 \\ 0.75 \\ 2.209 \\ 0.0567 \\ 0.110 \\ 0.194 \\ 0.075 \\ 0.206 \\ 0.110 \\ 0.138 \\ 0.177 \\ 0.112 \\ 0.194 \\ 0.499 \\ 0.056 \\ 0.063 \\ 0.035 \\ 0.089 \\ 0.266 \\ 0.054 \\ \end{array}$ | RSD
(%)
15.532
9.67
15.32
24.57
16.96
69.9
29.4
47.25
16.09
69.9
29.4
4.725
16.09
69.9
29.4
4.725
16.09
69.9
29.4
4.725
16.09
69.9
29.4
4.725
16.09
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20.716
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16.09
8.84
5.06
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16.64
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11.642
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10.84
11.642
20.717
11.644
20.716
15.47
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11.
 | $\begin{array}{r} 2132\\ \hline \\ \hline$ | $\begin{array}{c} (\mu g g^{-1}) \\ (\mu g g^{-1}) \\ 0.002 \\ 0.072 \\ 0.003 \\ 0.094 \\ 0.005 \\ 0.005 \\ 0.002 \\ 0.005 \\ 0.003 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.002 \\ 0.005 \\ 0.002 \\ 0.005 \\ 0.001 \\ 0$ | AV (µgg ⁻¹) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.32 1.06 0.77 0.90 45.99 0.90 45.99 0.83 0.56 1.97 0.60 0.63 0.76 0.86 0.72 0.83 0.83 0.83 0.83 0.83 0.83 0.86 0.72 0.83 0.83 0.83 0.83 0.83 0.83 0.83 | DIF (µg g ⁻¹) 2.03 0.75 0.00 2.29
 | 20 µm
20 µm
20 Fs
(%)
275
275
275
275
275
275
275
275 | $\begin{array}{c} & \text{SD} \left(1\sigma\right) \\ (\mugg^{-1}) \\ 0.203 \\ 1.032 \\ 0.196 \\ 0.957 \\ 0.830 \\ 0.269 \\ 0.364 \\ 0.937 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.372 \\ 0.101 \\ 0.3178 \\ 0.211 \\ 0.178 \\ 0.211 \\ 0.302 \\ 0.323 \\ 0.491 \\ 0.387 \\ 0.389 \\ 0.103 \\ 0.387 \\ 0.389 \\ 0.103 \\ 0.387 \\ 0.389 \\ 0.103 \\ 0.387 \\ 0.389 \\ 0.103 \\ 0.142 \\ 0.107 \\ 0.215 \\ 0.099 \\ 0.170 \\ 0.197 \\ 0.197 \\ 0.197 \\ 0.197 \\ 0.197 \\ 0.197 \\ 0.197 \\ 0.197 \\ 0.197 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.103$ | RSD
(%)
7.3
36.1
19.4
46.18
33.71
19.2
24.4
11.2
54.9
11.2
54.9
11.2
54.9
15.2
36.5
57.4
11.2
15.2
36.5
57.4
11.9
15.2
37.3
51.1
11.6
4
11.9
15.2
37.3
31.3
11.1
16.4
11.9
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17.9
17.9
17.9
17.9 | Sensitivity
(cps/ µ g g ⁻¹)
91
6
109
16
126
105
20
50
7
7
88
35
70
111
111
147
144
29
8
52
60
192
24
182
203
228
40
31
124
31
221 | DL
(µgg ⁻¹
)
0.008
0.554
0.004
<i>0.352</i>
0.006
<i>0.231</i>
0.022
0.006
<i>0.231</i>
0.027
<i>0.431</i>
0.007
<i>0.168</i>
0.023
0.005
0.004
0.002
0.005
0.015
0.004
0.002
0.003
0.003
0.003
0.003
0.004
0.003 |
| RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Go 0.74 Ti 3.61 V 1.01 Ga 1.31 Ga 1.31 Ge 0.942 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.848 Nb 0.824 Mo 0.8 Cd 0.56 Sn 1.68 Sb 0.79 Cs 0.664 Ba 3.2 La 0.72 Ce 0.813 Pr 0.768 Shd 0.752 Sm 0.754 Eu 0.774 Gd 0.763 Tb 0.739 Dy 0.746
 | BG
(cpp)
348
21.1
28.9
61.1
1017
10.67
158
137
34.7
6.7
133
8.0
20.0
2.67
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5.8
58.7
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 | DIF (μgg ⁻¹) 1.17 0.00 0.24 0.21 0.61 0.00 0.37 0.55 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.16 0.07 0.03 0.20 0.16 0.07 0.08 0.11 0.08 0.11 0.08 0.11 0.08 0.11 0.08 0.14
 | 40 μ m 40 μ m DIF% 158 0.1 24.2 17.3 124.2 17.3 19.6 10.0 1.4 4.67 19.59 6.62 16.5 17.64 9.76 8.36 4.4 6.29 0.78 10.75 14.0 4.18 11.52 20.92 19.34 | SD (1 σ) (μgg ⁻¹) 0.296 0.554 0.74 0.356 0.198 0.198 0.198 0.198 0.198 0.198 0.190 0.600 0.190 0.667 0.190 0.666 0.110 0.138 0.177 0.137 0.138 0.177 0.138 0.177 0.138 0.177 0.138 0.177 0.180 0.663 0.998 0.226 0.054 | RSD
(%)
15.53
15.53
9.67
16.96
20.29
14.48
5.06
9.97
14.02
29.4
8.84
8.84
8.84
16.64
7.80
30.64
16.64
7.80
11.1
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | $\begin{array}{c} 0.000\\ \hline 0.000\\ \hline 0.002\\ 0.002\\ 0.002\\ 0.003\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.001\\ 0.001\\ 0.002\\ 0.004\\ 0.001\\ 0.012\\ 0.002\\ 0.006\\ 0.001\\ 0.012\\ 0.005\\ 0.006\\ 0.001\\ 0.005\\ 0.006\\ 0.001\\ 0.005\\ 0.006\\ 0.001\\ 0.005\\ 0.006\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.003\\ 0.005\\ 0.003$ | AV (µgg1) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.32 1.06 0.71 0.90 45.9 0.89 0.83 0.56 0.63 2.98 0.72 0.89 0.86 0.72 0.89 0.83 0.72 0.89 0.86 0.72 0.89 0.83 0.72 0.89 0.80 0.72 0.89 0.83 0.72 0.89 0.83 0.72 0.89 0.83 0.86 0.72 0.89 0.83 0.81 0.87 | DIF (µg g g ⁻¹) 2.03 0.75 0.00 0.75 0.03 0.75 0.01 0.14 0.02 0.01 0.12 0.03 0.01 0.14 0.20 0.41 0.05 0.03 0.04 0.12
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18.55 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mug\frac{g^{-1}}{g}\right)\\ 0.203\\ 1.032\\ 0.196\\0203\\0203\\ 0.269\\036\\0$ | RSD
(%)
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11.22
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24.91
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(cps/ µ g g ⁻¹)
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126
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70
111
147
144
29
8
52
60
192
24
182
203
228
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192
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182
203
228
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31
1224
31
211
250 | DL (µ g g -1) 0.008 0.554 0.002 0.002 0.002 0.002 0.006 0.231 0.026 0.431 0.007 0.168 0.002
 0.008 0.002 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.015 0.0016 0.002 0.003 0.0040 0.0025 0.0021 |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $
 | BG
(cps)
348
21.1
28.9
61.1
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137
34.7
6.7
133
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20.0
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0 | $\begin{array}{c} 0.89\\ \hline \\ \hline$
 | DIF
(µgg ⁻¹)
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0.21
0.61
0.10
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0.37
0.55
0.13
0.13
0.13
0.13
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0.13
 | 40 µ m 40 µ m DIF% (%) 158 0.1 24.2 17.3 19.6 027.3 19.6 10.0 14 10.0 14 11.0 1.4 4.67 19.59 6.62 16.5 17.64 9.76 4.2 9.78 12.5.08 10.75 14.0 4.18 11.52 20.92 19.34 19.34 | SD (1 σ) (μg g ⁻¹) 0.296 0.554 0.074 0.396 0.198 0.198 0.224 0.253 1.060 0.198 0.253 1.060 0.198 0.224 0.253 1.060 0.192 0.567 0.194 0.075 2.096 0.110 0.138 0.138 0.137 0.138 0.138 0.138 0.0561 0.0633 0.0355 0.0899 0.254 0.054 0.067 | RSD
(%)
15.532
9.67
15.32
24.57
16.96
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 | $\begin{array}{r} 2132\\ \hline \\ \hline$ | μ | AV (µgg ⁻¹) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.32 1.06 0.71 0.90 9.99 1.25 0.83 0.56 1.97 0.60 0.63 0.76 0.86 0.72 0.83 0.83 0.76 0.86 0.72 0.83 0.83 0.98 1.03 0.83 | DIF (µg g ⁻¹) 2.03 0.75 0.00 0.29 0.12 0.01 0.12 0.038 0.01 0.12 0.05 0.01 0.12 0.05 0.01 0.05 0.10 0.05 0.19 0.03 0.09 0.04 0.05 0.19 0.03 0.09 0.14 0.06 0.22 0.24 0.25 0.26 0.27 0.04 0.05 0.05 0.05 0.02 0.04 0.05 0.05 0.02 0.02 0.03 0.04 0.05 0.05 0.05 <td>20 µm
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275</td> <td>$\begin{array}{c} & \text{SD} \left(1\sigma\right) \\ (\mugg^{-1}) \\ 0.203 \\ 1.032 \\ 0.196 \\ 0.957 \\ 0.830 \\ 0.269 \\ 0.364 \\ 0.937 \\ 0.364 \\ 0.937 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.364 \\ 0.372 \\ 0.101 \\ 0.3178 \\ 0.211 \\ 0.178 \\ 0.211 \\ 0.302 \\ 0.323 \\ 0.337$</td> <td>RSD
(%)
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37</td> <td>Sensitivity
(cps/ µ g g⁻¹)
91
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192
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124
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221
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7
107</td>
<td>DL
(µgg⁻¹)
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(cps/ µ g g ⁻¹)
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(µgg ⁻¹)
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| RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Go 0.74 Ti 3.61 V 1.01 Ga 1.31 Ga 1.31 Ga 0.942 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Ga 1.31 Ge 0.942 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.848 Mo 0.824 Mo 0.824 Mo 0.824 Mo 0.824 Mo 0.72 Ce 0.813 Pr 0.768 Shd 0.752 Sm 0.754 Eu 0.772 Gd 0.763 Tb 0.739 Dy 0.746 Ho 0.749
 | BG
(cpp)
348
21.1
28.9
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158
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34.7
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0 | AV (μg g ⁻¹) 1.91 3.61 0.77 0.98 0.81 0.60 0.77 0.981 0.61 0.77 0.81 0.66 0.84 0.77 0.77 0.77 0.77 0.77 0.66 0.84 0.77 0.67 0.43 0.77 0.67 0.43 0.71 0.73 0.85 0.89 0.89 0.89
 | DIF (μgg ⁻¹) 1.17 0.00 0.24 0.21 0.61 0.00 0.37 0.55 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.14 0.08 0.14 0.14
 | 40 µm 40 µm DIF% (%) 158 0.1 24.2 17.3 19.6 10.0 1.4 4.67 16.7 9.59 6.62 16.63 17.64 9.76 8.36 4.4 17.3 11.0 1.4 1.52 17.64 9.76 8.36 4.4 10.75 14.0 4.18 11.52 20.92 19.34 19.43 | SD (1 σ) (μgg ⁻¹) 0.296 0.554 0.74 0.356 0.198 0.118 0.224 0.253 1.060 0.198 0.190 0.567 0.190 0.5667 0.190 0.666 0.110 0.138 0.177 0.137 0.138 0.177 0.138 0.177 0.138 0.170 0.138 0.170 0.138 0.170 0.137 0.112 0.198 0.0660 0.063 0.198 0.226 0.054 0.000 | RSD
(%)
15.53
15.53
9.67
16.96
20.29
14.48
5.06
9.97
14.02
29.4
5.06
7.16
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7.16
7.16
7.1
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | $\begin{array}{c} \begin{array}{c} (\mu g \ g^{-1}) \\ (\mu g \ g^{-1}) \\ 0.002 \\ 0.002 \\ 0.002 \\ 0.003 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.003 \\ 0.007 \\ 0.003 \\ 0.007 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.000 \\ 0.001 \\ 0.005 \\ 0.000 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.000 \\ 0.001 \\ 0.005 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.001 \\ $ | AV (µgg') 2.77 2.86 1.01 1.48 1.80 0.80 1.48 1.80 0.80 1.24 1.32 1.06 1.32 1.06 0.71 0.90 45.9 0.89 0.83 0.56 0.603 2.98 0.72 0.89 0.86 0.72 0.89 0.83 0.86 0.72 0.89 0.83 0.71 0.90 0.86 0.72 0.89 0.86 0.72 0.89 0.87 0.03 0.87 1.03 | DIF (µg g ⁻¹) 2.03 0.75 0.00 0.75 0.03 0.75 0.01 0.14 0.02 0.01 0.12 0.03 0.01 0.14 0.20 0.41 0.05 0.03 0.04 0.14 0.05 0.02 0.14 0.05 0.12 0.22 0.04 0.12 0.21
 | 20 µm
DIF%
(%)
275
20.8
0.04
27
27
20.8
0.04
27
1.2
20.8
0.04
27
1.2
7
9
7.8
1.1
7
2
5.60
0.1
25.77
4.7.73
0.5
17.4
4.30
5.05
17.4
4.23.56
6.2
12.2.8.60
39.80
0.9.64
37.52
8.3
23.66
39.80
29.65
8.3
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20.8 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mug\frac{g^{-1}}{2}\right)\\ 0.203\\ 1.032\\ 0.196\\0203\\026\\0$ | RSD
(%)
7.3
36.1
19.4
46.18
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(cps/ µ g g ⁻¹)
91
6
109
76
126
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111
111
147
144
29
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52
60
192
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182
203
228
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192
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182
203
228
40
31
124
31
211
50
197
197 | DL (µ g g -1) 0.008 0.554 0.002 0.004 0.352 0.231 0.026 0.431
0.007 0.168 0.008 0.026 0.431 0.007 0.168 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.015 0.0016 0.037 0.002 0.003 0.0040 0.0025 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $
 | BG
(cps)
348
21.1
28.9
61.1
1017
158
137
34.7
6.7
133
8.0
20.0
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5.33
2.22
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5.33 | AV (µgg ⁻¹) 1.91 3.61 0.77 0.98 0.81 0.69 1.10 1.74 2.24 0.81 0.89 1.10 0.77 0.81 0.69 1.14 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.82 0.71 0.71 0.73 0.83 0.89 0.89 0.89 0.89 0.89 0.89
 | DIF
(µgg ⁻¹)
1.17
0.24
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0.61
0.10
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0.37
0.55
0.13
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0.13
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0.13
 | 40 µ m 40 µ m DIF% (%) 158 0.1 24.2 17.3 19.6 027.3 19.6 10.0 14 10.0 14 16.7 19.59 6.62 16.5 17.64 9.76 4.4 6.29 0.78 12.5.08 10.75 14.0 4.18 11.52 19.34 19.33 18.81 | SD (1 σ) (μg g ⁻¹) 0.296 0.554 0.074 0.356 0.198 0.198 0.224 0.253 1.060 0.190 0.567 0.190 0.567 0.190 0.567 0.190 0.666 0.110 0.086 0.138 0.177 0.138 0.177 0.138 0.110 0.0663 0.0663 0.0556 0.069 0.0564 0.100 0.087 0.087 0.087 | RSD
(%)
15.532
9.67
24.57
16.96
69.9
29.4
47.25
16.09
69.9
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 | $\begin{array}{r} 2132\\ \hline \\ \hline$ | $\begin{array}{c} (\mu g g^{-1}) \\ (\mu g g^{-1}) \\ 0.002 \\ 0.072 \\ 0.003 \\ 0.094 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.003 \\ 0.037 \\ 0.003 \\ 0.003 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.0005 \\ 0.0005 \\ 0.0005 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.001 \\ 0.005 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.001 \\ 0.003 \\ 0.001 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.005 \\ 0.003 $ | AV (µgg ⁻¹) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.32 1.06 0.71 0.90 9.99 1.25 0.83 0.56 0.90 45.99 0.83 0.56 0.97 0.83 0.60 0.83 0.76 0.86 0.72 0.89 0.83 0.98 0.83 0.98 0.83 0.98 0.83 0.98 0.83 0.99 0.83 0.98 0.86 0.72 0.87 1.03 0.87 1.03 0.93 0.93 | DIF (µg g ⁻¹) 2.03 0.75 0.00 0.29 0.12 0.05 0.01 0.12 0.038 0.01 0.12 0.05 0.01 0.12 0.05 0.01 0.020 0.40 0.05 0.19 0.03 0.09 0.14 0.06 0.22 0.14 0.06 0.22 0.14 0.26 0.28 0.19 0.29 0.14 0.20 0.28 0.19 0.28 0.29 0.14 0.28 0.19
 | 20 µm
DIF%
(%)
275
275
275
275
275
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27
1.2
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1.2
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1.2
9
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1.8
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1.3
4
5.60
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1.3
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5.60
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4.4
4.5
5.77
47.73
8.30
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6.2
12.2
4.86
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8.35
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17.5 | SD (1 σ)
(μg g ⁻¹)
0.203
1.032
0.196
0.830
0.269
0.343
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0.372
0.101
0.3459
0.3178
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0.3377
0.337777777777 | RSD
(%)
7.3
36.1
19.4
46.18
33.71
19.4
46.18
33.71
19.4
46.18
33.71
19.4
52.6
11.22
52.6
11.22
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52.6
11.2
15.2
36.5
57.4
1.5
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2.4.91
37.3
51.1
19.4
11.2
15.2
36.5
57.4
11.2
15.2
4.91
11.2
15.2
15.2
11.2
15.2
15.2
11.2
15.2
15 | Sensitivity
(cps/ µ g g ⁻¹)
91
6
109
16
126
105
20
50
7
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88
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111
111
144
76
144
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8
52
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192
24
8
52
60
192
24
182
203
228
40
31
124
131
2211
50
197
67
57 | DL
(µgg ⁻¹
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0.008
0.554
0.004
0.352
0.002
0.431
0.007
0.431
0.007
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| C 0.0223 RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Jan 1.31 Ge 0.942 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.644 Ba 3.2 La 0.72 Ce 0.813 Pr 0.764 Ba 3.22 Sm 0.754 Gd 0.763 Th 0.732
 | BG
(cpp)
348
21.1
28.9
61.1
1017
158
137
34.7
6.7
133
8.0
20.0
2.67
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177
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2.22 | AV (μg g ⁻¹) 1.91 3.61 0.77 0.98 0.81 0.61 0.77 0.98 0.81 0.61 0.77 0.81 0.66 0.84 0.77 0.77 0.77 0.77 0.67 0.46 1.52 0.72 0.63 0.71 0.73 0.86 0.89 0.89 0.89 0.89 0.89
 | DIF (μ g g ⁻¹) 1.17 0.00 0.24 0.21 0.37 0.55 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.16 0.07 0.03 0.20 0.11 0.03 0.20 0.11 0.03 0.20 0.11 0.03 0.20 0.11 0.03 0.04 0.15 0.14 0.15 0.14 0.14
 | | SD (1 σ) (μgg ⁻¹) 0.296 0.554 0.74 0.356 0.198 0.118 0.224 0.253 1.060 0.198 0.198 0.190 0.567 0.190 0.667 0.110 0.108 0.138 0.177 0.137 0.138 0.177 0.138 0.177 0.138 0.177 0.138 0.177 0.138 0.177 0.138 0.177 0.180 0.0660 0.0663 0.198 0.226 0.0554 0.0065 | 8.52 (%) 15.53 9.67 15.53 9.67 24.57 16.96 20.29 14.48 5.06 7.16 5.06 7.16 10.87 15.42 20.7 38.3 8.64 7.80 9.05 15.47 16.64 7.86 6.02 9.7 10.6 11.2 9.7 10.6 7.46
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | $\begin{array}{c} (\mu g g^{-1}) \\ (\mu g g^{-1}) \\ 0.002 \\ 0.002 \\ 0.003 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.005 \\ 0.0005 \\ 0.001 \\ $ | AV (µgg1) 2.77 2.86 1.01 1.48 1.80 0.80 1.24 1.32 1.32 1.06 0.71 0.90 0.59 0.89 0.83 0.56 1.97 0.603 0.63 2.98 0.72 0.89 0.86 0.72 0.89 0.83 0.63 2.98 0.72 0.89 0.86 0.72 0.89 0.83 0.86 0.72 0.89 0.83 0.86 0.72 0.89 0.83 0.86 0.72 0.89 0.83 0.87 1.03 0.98 1.03 0.92 1.03 | DIF (µg g g^{-1}) 2.03 0.75 0.00 0.75 0.03 0.75 0.01 0.29 0.38 0.01 0.14 0.020 0.01 0.20 0.403 0.05 0.1 0.20 0.403 0.05 0.09 0.10 0.03 0.22 0.04 0.14 0.05 0.21 0.28 0.12 0.28 0.12
 | 20 µm
20 µm
20 Fs
4
275
275
20.8
0.04
27
275
20.8
0.04
27
7
2
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7 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mug\frac{g^{-1}}{g}\right)\\ 0.203\\ 1.032\\ 0.196\\ .0.957\\ 0.830\\ 0.269\\ 0.343\\ 0.364\\ .0.938\\ 0.148\\ .0.938\\ 0.148\\ .0.938\\ 0.148\\ .0.938\\ 0.148\\ .0.938\\ 0.148\\ .0.938\\ .0.148\\ .0.938\\ .0.178\\ 0.011\\ 0.215\\ 0.089\\ .0.103\\ 0.142\\ 0.387\\ .0.887\\ .0.887\\ .0.887\\ .0.887\\ .0.887\\ .0.887\\ .0.887\\ .0.887\\ .0.887\\ .0.887\\ .0.887\\ .0.887\\ .0.887\\ .0.887\\ .0.887\\ .0.887\\ .0.887\\ .0.87\\ .0.87\\ .0.87\\ .0.87\\ .0.87\\ .0.87\\ .0.87\\ .0.87\\ .0.87\\ .0.87\\ .0.87\\ .0.87\\ .0.87\\ .0.87\\ .0.87\\ .0.87\\ .0.87\\ .0.98\\ .0.93\\ .0.103\\ .0.102\\ .0.107\\ .0.107\\ .0.107\\ .0.103\\ .0.196\\ .0.196\\ .0.196\\ .0.196\\ .0.233\\ .0.$ | RSD
(%)
7.3
36.1
19.4
46.18
33.71
27.7
24.4
54.9
52.6
11.22
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15.2
36.5
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24.91
37.3
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17.54555555555555 | Sensitivity
(cps/ µ g g ⁻¹)
91
6
109
76
126
50
7
88
35
70
111
147
144
29
8
52
60
192
24
182
203
228
60
192
24
182
203
228
40
31
124
31
211
50
197
67
207 | DL (µ g g -1) 0.008 0.554 0.002 0.002 0.002 0.002 0.003 0.231
 0.026 0.431 0.007 0.168 0.008 0.002 0.008 0.002 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.015 0.0012 0.003 0.0025 0.003 0.021 0.003 0.012 0.003 0.025 0.003 0.012 |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $
 | BG
(cps)
348
21.1
28.9
61.1
1017
158
137
34.7
6.7
133
8.0
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2.2 | 0.89 AV (µg g ⁻¹) 1.91 3.61 0.77 0.98 0.81 0.69 1.74 2.24 1.18 0.81 0.89 1.74 2.24 0.81 0.69 1.74 2.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.82 0.71 0.71 0.73 0.83 0.89 0.89 0.89 0.89 0.89 0.89 0.89
 | DIF
(µgg ⁻¹)
1.17
0.24
0.21
0.61
0.10
0.37
0.55
0.13
0.13
0.13
0.01
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0.14
0.15
0.14
0.14
0.11
0.11
 | 40 µm 40 µm DJF% (%) 158 0.1 24.2 17.3 19.6 10.0 14 10.0 14 16.7 19.59 6.62 16.5 17.64 9.76 9.78 12.508 10.75 14.0 4.18 11.22.0.92 19.34 19.84 18.86 14.5 | SD (1 σ) (μg g ⁻¹) 0.296 0.554 0.074 0.356 0.198 0.118 0.224 0.253 1.060 0.198 0.198 0.190 0.567 0.194 0.075 2.209 0.066 0.108 0.138 0.177 0.138 0.499 0.056 0.060 0.063 0.035 0.112 0.949 0.256 0.060 0.056 0.056 0.056 0.056 0.056 0.056 0.056 0.056 0.056 0.0574 0.093 0.063 0.0448 | RSD
(%)
15.53
9.67
15.32
9.67
16.96
47.25
24.57
16.96
69.9
9.14.48
47.25
20.29
14.48
47.25
20.29
14.48
47.25
20.29
14.48
5.06
47.26
20.7
38.3
9.05
15.47
30.64
4.2
23.0
11.1
26.58
6.02
11.2
6.58
6.02
11.2
6.58
4.57
7.16
6.02
11.2
6.58
8.43
8.43
8.44
4.2
2.30
11.1
6.64
7.16
6.02
11.2
6.53
7.16
8.43
8.43
8.44
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8.45
 | $\begin{array}{r} 2132\\ \hline \\ \hline$ | $\begin{array}{c} (\mu g g^{-1}) \\ (\mu g g^{-1}) \\ 0.002 \\ 0.072 \\ 0.003 \\ 0.094 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.002 \\ 0.004 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.006 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.0005 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.001 \\ 0.001 \\ 0.003 \\ 0.001 \\ 0.001 \\ 0.003 \\ 0.001 \\ $ | AV (µg g ⁻¹) 2.77 2.86 1.01 7.48 1.80 0.80 1.24 1.49 2.70 2.86 0.90 1.24 1.32 7.06 0.71 0.90 45.9 0.83 0.56 0.86 0.76 0.86 0.83 0.98 0.83 0.98 0.83 0.98 0.83 0.98 0.83 0.98 0.83 0.98 0.83 0.98 0.83 0.93 0.93 0.92 | DIF (µg g ⁻¹) 2.03 0.75 0.00 0.75 0.038 0.12 0.038 0.01 0.12 0.05 0.01 0.12 0.05 0.01 0.12 0.05 0.01 0.02 0.03 0.05 0.19 0.03 0.09 0.14 0.22 0.14 0.28 0.19 0.12 0.23 0.14 0.14 0.14 0.19 0.18 0.19
 | 20 µm
DIF%
(%)
275
275
275
275
275
27
27
1.2
27
1.2
9
1.8
1.1
1.1
7.3
4
7.5
0.5
0.1
25.77
47.73
8.30
0.1
25.77
47.73
8.35
6.9
6.2
12.2
4.860
8.35
8.860
8.39.80
16.4
5.26
8.37
26.31
12.2
26.31
8.25
8.35
8.35
8.35
8.35
8.35
8.35
8.35
8.3 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mugg^{-1}) \\ 0.203 \\ 1.032 \\ 0.196 \\$ | RSD
(%)
7.3
36.1
19.4
46.18
33.71
24.4
43.27
7.24
44,13
37.2
24.4
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54.9
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3 | Sensitivity
(cps/ µ g g ⁻¹)
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109
16
126
105
20
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7
88
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1111
147
144
29
8
52
60
192
24
28
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192
24
24
182
203
228
40
31
124
182
203
228
40
31
124
124
31
2211
50
57
7
44 | DL (µgg ⁻¹) 0.008 0.554 0.004 0.352 0.004 0.352 0.004 0.352
0.004 0.352 0.005 0.017 0.063 0.015 0.003 0.003 0.004 0.005 0.015 0.003 0.003 0.004 0.005 0.003 0.004 0.005 0.015 0.003 0.004 0.005 0.003 0.0040 0.005 0.003 0.0021 0.003 0.012 0.0021 |
| C 0.0223 RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Mi 1.11 Cu 1.37 Zr 0.62 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.684 Mo 0.824 Mo 0.824 Mo 0.824 Mo 0.824 Mo 0.824 Mo 0.824 Mo 0.762 Ce 0.813 Pr 0.768 Shd 0.752 Sm 0.732 Dy 0.746 Ho 0.732 Yb 0.772 Yb 0.732 Yb 0.732
 | BG
(cpps)
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21.1
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2.2 | AV (μg g ⁻¹) 1.91 3.61 0.77 0.98 0.81 0.61 0.77 0.98 0.81 0.61 0.77 0.81 0.66 0.84 0.77 0.77 0.77 0.77 0.67 0.46 0.83 0.71 0.71 0.71 0.73 0.86 0.89 0.89 0.89 0.89 0.89 0.87 0.86
 | DIF (μ g g ⁻¹) 1.17 0.00 0.24 0.21 0.37 0.55 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.10 0.16 0.07 0.03 0.10 0.11 0.03 0.01 0.10 0.14 0.15 0.14 0.14 0.13
 | | SD (1 σ) (μgg ⁻¹) 0.296 0.554 0.74 0.356 0.198 0.112 0.223 1.060 0.190 0.672 0.190 0.666 0.110 0.108 0.138 0.177 0.138 0.177 0.138 0.177 0.138 0.177 0.138 0.177 0.138 0.177 0.138 0.77 0.138 0.77 0.112 0.993 0.0660 0.0663 0.087 0.087 0.093 0.065 0.149 | 8.52 (%) 15.53 9.67 15.53 9.67 16.96 24.57 16.96 20.29 14.48 8.47 25.06 7.16 7.16 10.87 20.7 15.42 20.7 16.64 7.86 6.02 9.7 10.67 7.46 16.64 7.46 16.64 7.45
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | $\begin{array}{c} (\underline{\mu}\underline{g}\underline{g}^{-1})\\ 0.002\\ 0.072\\ 0.002\\ 0.072\\ 0.003\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.001\\ 0.002\\ 0.004\\ 0.001\\ 0.002\\ 0.006\\ 0.001\\ 0.005\\ 0.006\\ 0.001\\ 0.005\\ 0.006\\ 0.001\\ 0.005\\ 0.006\\ 0.001\\ $ | AV (µg g ⁻¹) 2.77 2.86 1.01 1.48 1.80 0.80 1.48 1.49 2.74 1.32 1.09 2.77 0.90 1.24 1.32 1.06 0.71 0.90 45.9 0.99 1.25 0.89 0.83 0.56 1.97 0.603 2.98 0.76 0.86 0.72 0.89 0.83 0.86 0.72 0.89 0.83 0.98 1.03 0.98 1.03 0.92 0.97 | DIF (µg,g^-1) 2.03 0.75 0.00 0.29 0.38 0.01 0.229 0.38 0.01 0.14 0.05 0.01 0.20 0.414 0.05 0.1 0.20 0.40 0.41 0.20 0.43 0.05 0.09 0.12 0.22 0.04 0.14 0.20 0.212 0.22 0.23 0.24 0.12 0.28 0.19 0.18 0.24
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18.50 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mug\frac{g^{-1}}{g}\right)\\ 0.203\\ 1.032\\ 0.196\\ .0.957\\ 0.830\\ 0.269\\ 0.343\\ 0.364\\ .0.938\\ 0.148\\ .0.938\\ 0.148\\ .0.938\\ 0.178\\ 0.372\\ 0.101\\ .0.372\\ 0.101\\ .0.323\\ 0.372\\ 0.101\\ 0.215\\ 0.089\\ 0.103\\ 0.142\\ 0.387\\ 0.089\\ 0.103\\ 0.142\\ 0.387\\ 0.089\\ 0.103\\ 0.142\\ 0.387\\ 0.089\\ 0.103\\ 0.142\\ 0.089\\ 0.103\\ 0.142\\ 0.009\\ 0.196\\ 0.123\\ 0.033\\ 0.235\\ 0.101\\ 0.215\\ 0.033\\ 0.235\\ 0.123\\ 0.033\\ 0.235\\ 0.101\\ 0.215\\ 0.033\\ 0.235\\ 0.215\\ 0.033\\ 0.235\\ 0.201\\ 0$ | RSD
(%)
19.4
64.6
64.6
46.18
33.71
27.7
24.4
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54.9
52.6
11.22
54.9
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57.4
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15.2
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2 | Sensitivity
(cps/ µ g g ⁻¹)
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105
20
50
7
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111
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144
29
8
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60
192
24
182
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228
60
192
24
182
203
228
60
192
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182
203
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192
24
197
67
207
44
196 | DL (µ g g -1) 0.008 0.554 0.002 0.002 0.002 0.002 0.003 0.231
0.026 0.431 0.026 0.431 0.007 0.168 0.002 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.012 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.021 0.003 0.021 |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $
 | BG
(cps)
348
21.1
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2.2 | 0.89 AV (µgg ⁻¹) 1.91 3.61 0.77 0.98 0.81 0.69 1.74 2.24 1.81 0.81 0.89 1.74 2.24 0.81 0.61 0.77 0.81 0.81 0.81 0.81 0.81 0.81 0.82 0.71 0.71 0.73 0.83 0.80 0.82 0.89 0.88 0.87 0.889 0.889 0.860 0.87
 | DIF
(µgg ⁻¹)
1.17
0.24
0.21
0.61
0.00
0.37
0.55
0.13
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 | 40 μ m 40 μ m DIF% (%) 158 0.1 24.2 17.3 17.3 19.6 10.0 14 11.0 14.4 16.7 19.59 6.62 16.5 17.64 9.76 9.78 12.2 12.0 0.78 12.2 0.92 19.34 19.34 19.418 11.65 18.81 18.81 18.63 14.5 18.03 19.72 | SD (1 σ) (μg g ⁻¹) 0.296 0.554 0.074 0.356 0.198 0.118 0.224 0.253 1.060 0.198 0.190 0.567 0.194 0.075 2.209 0.066 0.110 0.086 0.138 0.177 0.138 0.0566 0.060 0.063 0.056 0.063 0.0564 0.054 0.0933 0.0654 0.1448 0.037 | RSD
(%)
15.53
9.67
15.32
9.67
15.32
24.57
16.96
69.9
14.48
47.25
20.29
14.48
47.25
20.29
14.48
47.25
20.29
14.40
29.4
8.84
47.25
9.05
15.47
30.64
4.2
23.0
11.1
26.58
6.02
11.2
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7.16
 | $\begin{array}{r} 2132\\ \hline \\ \hline$ | μ | AV (µg g ⁻¹) 2.77 2.86 1.01 7.48 1.80 0.80 1.24 1.49 2.70 2.86 0.90 1.22 1.32 7.06 0.71 0.90 45.9 0.83 0.56 0.771 0.90 45.9 0.83 0.56 0.97 0.83 0.86 0.76 0.86 0.72 0.83 0.93 0.93 0.92 0.92 0.97 | DIF (µgg ⁻¹) 2.03 0.75 0.00 <i>a.29</i> 0.12 <i>a.14</i> 0.12 <i>a.03</i> 0.01 <i>a.14</i> 0.12 <i>a.03</i> 0.01 <i>a.14</i> 0.12 <i>a.03</i> 0.01 <i>a.14</i> 0.12 <i>a.03</i> 0.05 0.11 0.20 0.407 0.03 0.03 0.047 0.05 0.19 0.03 0.029 0.19 0.14 0.22 0.14 0.28 0.19 0.18 0.14 0.28 0.19 0.14 0.28 0.19 0.14 0.28 0.19
 | 20 µm
DIF%
(%)
275
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275
275
275
27
27
1.2
27
1.2
9
9
1.8
1.1
1.3
4
4
5.60
0.1
25.77
47.73
8.30
0.5
1.7.4
23.56
4.4
6.9
6.2
12.2
4.860
8.35
8.800
16.4
8.2
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8.62
8.322
24.61
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1 | SD (1 σ)
(μ g g ⁻¹)
0.203
1.032
0.196
<i>0.957</i>
0.830
0.269
0.364
<i>0.364</i>
<i>0.364</i>
<i>0.364</i>
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<i>0.364</i>
<i>0.364</i>
<i>0.364</i>
0.364
<i>0.362</i>
0.101
3.459
0.101
0.325
0.322
0.323
0.323
0.364
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33.71
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37.2
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11 | Sensitivity
(cps/ µ g g ⁻¹)
91
6
109
16
126
105
20
50
7
88
35
70
1111
147
144
29
8
35
70
1111
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52
60
192
24
28
52
60
192
24
182
203
228
40
31
124
131
211
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197
67
207
44
196 | DL (µgg ⁻¹) 0.008 0.554 0.004 0.352 0.004 0.352 0.004 0.352 0.004
 0.352 0.005 0.017 0.063 0.015 0.003 0.015 0.003 0.003 0.004 0.005 0.015 0.003 0.003 0.004 0.005 0.015 0.003 0.0040 0.005 0.015 0.003 0.0040 0.005 0.0021 0.003 0.012 0.021 0.021 0.021 0.021 0.021 |
| C 0.0223 RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Mi 1.11 Cu 1.37 Zr 0.942 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.684 Ba 3.2 La 0.72 Ce 0.813 Pr 0.768 Shd 0.752 Sm 0.731 Th 0.732 Yb<0.777
 | BG
(cpps)
348
21.1
28.9
61.1
1017
10.67
158
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34.7
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133
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2.22 | AV (μg g ⁻¹) 1.91 3.61 0.77 0.98 0.81 0.61 0.77 0.98 0.81 0.61 0.77 0.81 0.66 0.84 0.77 0.77 0.77 0.67 0.46 0.83 0.77 0.77 0.77 0.72 0.73 0.86 0.85 0.89 0.89 0.89 0.89 0.86 0.87 0.889 0.87 0.89 0.89 0.89 0.86 0.85 0.89 0.86 0.87
 | DIF (μ g g ⁻¹) 1.17 0.00 0.24 0.61 0.00 0.37 0.55 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.10 0.16 0.07 0.05 0.13 0.10 0.16 0.07 0.03 0.20 0.11 0.05 0.13 0.14 0.15 0.14 0.15 0.14 0.13 0.14 0.15
 | 40 μ 40 μ 40 μ 0 μ 0 158 0.1 24.2 17.3 19.6 10.0 1.4 11.0 1.4 16.7 19.59 6.62 16.5 17.64 9.76 8.36 4.4 9.76 8.36 11.52 20.92 19.34 11.52 20.92 19.34 18.66 14.5 18.66 14.5 18.66 14.5 19.72 0.22 | SD (1 σ) (μgg ⁻¹) 0.296 0.554 0.74 0.356 0.198 0.198 0.198 0.198 0.198 0.198 0.190 0.600 0.190 0.666 0.110 0.108 0.138 0.177 0.137 0.138 0.177 0.138 0.177 0.138 0.177 0.138 0.177 0.122 0.905 0.198 0.0660 0.0663 0.087 0.093 0.226 0.054 0.035 0.148 0.039 0.127 | 8.52 (%) 15.53 9.67 15.53 9.67 16.96 24.57 16.96 20.29 14.48 8.47.25 16.09 29.4 8.84 8.84 8.64 4.2 23.0 9.05 30.64 16.64 7.86 6.02 9.7 10.6 7.46 16.62 9.5 11.1 26.58 6.02 9.7 10.6 7.46 16.52 14.9 8.50
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | L.000 μg g ⁻¹) 0.002 0.002 0.003 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.007 0.007 0.008 0.009 0.001 0.001 0.001 0.005 0.006 0.001 0.005 0.006 0.001 0.005 0.006 0.001 0.005 0.001 0.002 0.003 0.004 0.001 0.003 0.001 0.002 | AV (µgg1) 2.77 2.86 1.01 1.48 1.80 0.80 1.48 1.80 0.80 1.24 1.32 1.06 1.74 1.32 1.00 80 0.71 0.90 45.9 0.99 1.25 0.89 0.83 0.56 1.97 0.603 2.98 0.76 0.86 0.72 0.89 0.83 0.98 1.03 0.98 1.03 0.92 0.97 0.89 0.87 | DIF (µg,g^-1) 2.03 0.75 0.00 0.29 0.38 0.01 0.27 0.38 0.01 0.14 0.05 0.01 0.29 0.38 0.01 0.20 0.03 0.020 0.40 0.43 0.05 0.09 0.10 0.02 0.03 0.22 0.04 0.04 0.14 0.05 0.12 0.28 0.12 0.28 0.12 0.28 0.18 0.14 0.15
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19.50 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mug\frac{g^{-1}}{g}\right)\\ 0.203\\ 1.032\\ 0.196\\ 0.2957\\ 0.830\\ 0.269\\ 0.343\\ 0.364\\ 0.363\\ 0.196\\ 0.372\\ 0.101\\ 0.372\\ 0.101\\ 0.372\\ 0.101\\ 0.372\\ 0.178\\ 0.372\\ 0.101\\ 0.372\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.324\\ 0.387\\ 0.089\\ 0.103\\ 0.142\\ 0.387\\ 0.089\\ 0.103\\ 0.142\\ 0.387\\ 0.089\\ 0.103\\ 0.142\\ 0.387\\ 0.089\\ 0.193\\ 0.103\\ 0.125\\ 0.099\\ 0.196\\ 0.193\\ 0.033\\ 0.235\\ 0.101\\ 0.197\\ 0.097\\ 0.097\\ 0.097\\ 0.097\\ 0.097\\ 0.0008\\ 0.0008\\ 0.$ | RSD
(%)
19.4
64.6
64.6
64.6
19.2
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54.9
52.6
11.22
54.9
15.2
36.5
7.4
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57.4
24.91
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24 | Sensitivity
(cps/ µ g g ⁻¹)
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91
67
207
44
197
67
207
44
197
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20 | DL (µ g g -1) 0.008 0.554 0.022 0.002 0.002 0.004 0.352 0.231
0.026 0.431 0.007 0.168 0.002 0.005 0.015 0.004 0.005 0.016 0.005 0.012 0.004 0.004 0.005 0.012 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.0021 0.003 0.0021 0.0022 |
| B 0.0223 RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Gr 1.19 Mn 1.42 Co 0.79 Zr 2.79 Ga 1.31 Ge 0.942 As 0.74 As 0.74 Mo 0.8255 Sr 45.8 Vb 0.824 Mo 0.824 Mo 0.824 Mo 0.824 Mo 0.79 Ce 0.813 Pr 0.768 Sm 0.754 Eu 0.77 Gd 0.763 Dy 0.740 Fr 0.749 Fr 0.739 Dy 0.732 Yb 0.777 Lu 0.732 Yb 0.7711 Ta 0.808 <
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21.1
28.9
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2.111 | 0.89 AV (μg g ⁻¹) 1.91 3.61 0.77 0.98 0.81 0.69 1.74 2.24 1.81 0.81 0.82 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.82 0.84 43.7 0.82 0.71 0.71 0.73 0.83 0.89 0.89 0.89 0.88 0.87 0.885 0.81 0.82 0.83
 | DIF
(µgg ⁻¹)
1.17
0.00
0.24
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0.10
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 | 1.0 µm 40 µm DJF% (%) 158 0.1 24.2 17.3 19.6 10.0 14 10.0 14 16.7 19.59 6.62 16.5 17.64 9.76 8.36 0.75 14.0 11.52 20.92 19.34 18.81 18.81 18.83 19.72 14.5 18.81 18.81 18.81 18.81 18.81 18.81 18.81 18.81 18.81 18.81 18.81 18.81 18.81 18.81 18.81 17.72 | SD (1 σ) (μg g ⁻¹) 0.296 0.554 0.074 0.356 0.198 0.118 0.224 0.253 1.060 0.190 0.567 0.190 0.567 0.190 0.567 0.190 0.666 0.110 0.108 0.138 0.177 0.138 0.108 0.666 0.663 0.063 0.0556 0.0561 0.0562 0.0564 0.100 0.089 0.226 0.148 0.039 0.127 0.770 | RSD
(%)
15.53
15.53
9.67
16.96
47.25
24.57
16.96
69.9
14.48
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14.48
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8.64
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20.7
38.3
9.05
15.47
30.64
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38.43
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25.77
47.73
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25.75 | SD (1 σ)
(μg g ⁻¹)
0.203
1.032
0.196
<i>0.957</i>
0.830
0.269
0.343
0.364
<i>0.957</i>
0.101
0.484
0.372
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0.3459
0.327
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0.197 | RSD
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17 | Sensitivity
(cps/ µ g g ⁻¹)
91
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109
76
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105
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1111
147
144
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192
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20 | DL (µgg ⁻¹) 0.008 0.554 0.004 0.352 0.004 0.352 0.004 0.352 0.004 0.352
 0.007 0.063 0.015 0.003 0.015 0.004 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.015 0.003 0.003 0.004 0.005 0.003 0.004 0.005 0.003 0.0040 0.0051 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0022 |
| C 0.0223 RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Zr 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.684 Mo 0.824 Mo 0.72 Ce 0.813 Pr 0.763 The 0.752 Sm 0.754 Gu 0.763 The 0.732 Yb 0.732 Yb 0.731 Ta 0.806
 | BG
(cops)
348
21.1
28.9
61.1
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10.67
158
137
34.7
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2.2 | AV (μg g ⁻¹) 1.91 3.61 0.77 0.98 0.81 0.61 0.77 0.98 0.81 0.61 0.77 0.77 0.74 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.81 0.82 0.82 0.83 0.80 0.77 0.67 0.46 0.83 0.83 0.80 0.85 0.89 0.89 0.89 0.89 0.86 0.85 0.81 0.82 0.83 0.84 0.87 0.889 0.86 0.85 0.81 0.82 </td <td>με g⁻¹ LIF (με g⁻¹) 1.17 0.00 0.24 0.21 0.37 0.55 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.16 0.07 0.13 0.16 0.07 0.03 0.20 0.11 0.13 0.10 0.04 0.11 0.03 0.01 0.04 0.11 0.03 0.04 0.15 0.14 0.15 0.14 0.15 0.14 0.13 0.14 0.15</td> <td></td> <td>c.300 c (μgg⁻¹) 0.296 0.554 0.574 0.356 0.356 0.198 0.118 0.224 0.253 1.060 0.190 0.667 0.190 0.666 0.110 0.108 0.138 0.177 0.137 0.132 0.194 0.499 0.554 0.0663 0.087 0.087 0.087 0.087 0.087 0.398 0.127 0.799</td> <td>8.52 (%) 15.53 9.67 15.53 9.67 16.96 24.57 16.96 20.29 14.48 8.47 25.06 7.16 7.16 10.87 15.42 20.7 30.64 16.64 7.86 6.02 9.7 10.67 7.46 16.64 7.46 16.65 16.64 7.46 16.84 4.52 11.1 26.58 6.02 9.7 10.6 7.46 13.8</td> <td>$\begin{array}{c} 2132\\ \hline \\ \hline$</td> <td>$\begin{array}{c} (\underline{\mu}\underline{g}\underline{g}^{-1})\\ 0.002\\ 0.002\\ 0.002\\ 0.003\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.001\\ 0.002\\ 0.004\\ 0.001\\ 0.012\\ 0.005\\ 0.006\\ 0.001\\ 0.001\\ 0.005\\ 0.003\\ 0.001\\ 0.001\\ 0.005\\ 0.003\\ 0.001\\
0.001\\ 0.001\\$</td> <td>AV (µg g⁻¹) 2.77 2.86 1.01 1.48 1.80 0.80 1.48 1.80 0.82 1.44 1.49 2.74 1.32 1.06 0.71 0.90 45.9 0.99 1.25 0.89 0.83 0.56 1.97 0.603 2.98 0.72 0.89 0.83 0.86 0.86 0.86 0.86 0.98 1.03 0.92 0.97 0.89 0.81</td> <td>DIF (µg,g⁻¹) 2.03 0.75 0.00 0.75 0.03 0.75 0.01 0.29 0.38 0.01 0.14 0.05 0.01 0.20 0.403 0.05 0.1 0.20 0.403 0.05 0.09 0.10 0.03 0.22 0.04 0.04 0.12 0.28 0.12 0.28 0.12 0.28 0.12 0.28 0.12 0.28 0.11 0.24 0.27</td> <td>20 µm
20 µm
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225
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20.8
0.04
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0.5</td> <td>$\begin{array}{c} {\rm SD} \left(1\sigma\right)\\ \left(\mug\frac{g^{-1}}{g}\right)\\ 0.203\\ 1.032\\ 0.196\\ 0.2957\\ 0.830\\ 0.269\\ 0.343\\ 0.364\\ 0.363\\ 0.148\\ 0.583\\ 0.148\\ 0.583\\ 0.148\\ 0.372\\ 0.101\\ 0.372\\ 0.101\\ 0.372\\ 0.101\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.324\\ 0.387\\ 0.089\\ 0.103\\ 0.142\\ 0.387\\ 0.089\\ 0.103\\ 0.142\\ 0.387\\ 0.089\\ 0.103\\ 0.142\\ 0.009\\ 0.190\\ 0.193\\ 0.033\\ 0.235\\ 0.101\\ 0.197\\ 0.083\\ 0.135$</td> <td>RSD
(%)
7.3
36.1
19.4
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11.22
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(cps/ µ g g⁻¹)
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111
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192
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203
228
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192
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61</td> <td>DL (µ g g -1) 0.008 0.554 0.022 0.002 0.0231 0.231 0.225 0.226 0.435 0.026 0.431 0.007 0.168 0.002 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.012 0.004 0.005 0.012 0.003 0.004 0.003 0.002 0.003 0.004 0.004 0.005 0.003 0.004 0.003 0.0021 0.0020 0.0021 0.0022 0.0021</td> | με g ⁻¹ LIF (με g ⁻¹) 1.17 0.00 0.24 0.21 0.37 0.55 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.16 0.07 0.13 0.16 0.07 0.03 0.20 0.11 0.13 0.10 0.04 0.11 0.03 0.01 0.04 0.11 0.03 0.04 0.15 0.14 0.15 0.14 0.15 0.14 0.13 0.14 0.15
 | | c.300 c (μgg ⁻¹) 0.296 0.554 0.574 0.356 0.356 0.198 0.118 0.224 0.253 1.060 0.190 0.667 0.190 0.666 0.110 0.108 0.138 0.177 0.137 0.132 0.194 0.499 0.554 0.0663 0.087 0.087 0.087 0.087 0.087 0.398 0.127 0.799 | 8.52 (%) 15.53 9.67 15.53 9.67 16.96 24.57 16.96 20.29 14.48 8.47 25.06 7.16 7.16 10.87 15.42 20.7 30.64 16.64 7.86 6.02 9.7 10.67 7.46 16.64 7.46 16.65 16.64 7.46 16.84 4.52 11.1 26.58 6.02 9.7 10.6 7.46 13.8
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | $\begin{array}{c} (\underline{\mu}\underline{g}\underline{g}^{-1})\\ 0.002\\ 0.002\\ 0.002\\ 0.003\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.001\\ 0.002\\ 0.004\\ 0.001\\ 0.012\\ 0.005\\ 0.006\\ 0.001\\ 0.001\\ 0.005\\ 0.003\\ 0.001\\ 0.001\\ 0.005\\ 0.003\\ 0.001\\ $ | AV (µg g ⁻¹) 2.77 2.86 1.01 1.48 1.80 0.80 1.48 1.80 0.82 1.44 1.49 2.74 1.32 1.06 0.71 0.90 45.9 0.99 1.25 0.89 0.83 0.56 1.97 0.603 2.98 0.72 0.89 0.83 0.86 0.86 0.86 0.86 0.98 1.03 0.92 0.97 0.89 0.81 | DIF (µg,g ⁻¹) 2.03 0.75 0.00 0.75 0.03 0.75 0.01 0.29 0.38 0.01 0.14 0.05 0.01 0.20 0.403 0.05 0.1 0.20 0.403 0.05 0.09 0.10 0.03 0.22 0.04 0.04 0.12 0.28 0.12 0.28 0.12 0.28 0.12 0.28 0.12 0.28 0.11 0.24 0.27 | 20 µm
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0.5 | $\begin{array}{c} {\rm SD} \left(1\sigma\right)\\ \left(\mug\frac{g^{-1}}{g}\right)\\ 0.203\\ 1.032\\ 0.196\\ 0.2957\\ 0.830\\ 0.269\\ 0.343\\ 0.364\\ 0.363\\ 0.148\\ 0.583\\ 0.148\\ 0.583\\ 0.148\\ 0.372\\ 0.101\\ 0.372\\ 0.101\\ 0.372\\ 0.101\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.324\\ 0.387\\ 0.089\\ 0.103\\ 0.142\\ 0.387\\ 0.089\\ 0.103\\ 0.142\\ 0.387\\ 0.089\\ 0.103\\ 0.142\\ 0.009\\ 0.190\\ 0.193\\ 0.033\\ 0.235\\ 0.101\\ 0.197\\ 0.083\\ 0.135$ | RSD
(%)
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2 | Sensitivity
(cps/ µ g g ⁻¹)
91
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61 | DL (µ g g -1) 0.008 0.554 0.022 0.002 0.0231 0.231 0.225 0.226 0.435 0.026 0.431 0.007 0.168 0.002 0.005 0.015 0.004 0.005 0.015 0.004 0.005 0.012 0.004 0.005 0.012 0.003 0.004 0.003 0.002 0.003
0.004 0.004 0.005 0.003 0.004 0.003 0.0021 0.0020 0.0021 0.0022 0.0021 |
| $\begin{array}{c c} & 0.0223 \\ \hline \\ & RV \\ (\mu g g^{-1}) \\ Sc & 0.74 \\ Ti & 3.61 \\ V & 1.01 \\ Gr & 1.19 \\ Mn & 1.42 \\ Co & 0.79 \\ Ni & 1.1 \\ Cu & 1.37 \\ Zn & 2.79 \\ Ga & 1.31 \\ Ge & 0.942 \\ As & 0.74 \\ As & 0.74 \\ As & 0.74 \\ As & 0.74 \\ Ro & 0.855 \\ Sr & 45.8 \\ Nb & 0.855 \\ Sr & 45.8 \\ Nb & 0.855 \\ Sr & 45.8 \\ Nb & 0.855 \\ Sr & 0.79 \\ Zr & 0.848 \\ Nb & 0.855 \\ Sr & 0.79 \\ Zr & 0.848 \\ Nb & 0.855 \\ Sr & 0.79 \\ Zr & 0.848 \\ Nb & 0.855 \\ Sr & 0.79 \\ Zr & 0.848 \\ Nb & 0.855 \\ Sr & 0.79 \\ Zr & 0.74 \\ Sr & 0.77 \\ Ca & 0.754 \\ Eu & 0.77 \\ Gd & 0.768 \\ Sm & 0.754 \\ Eu & 0.777 \\ Gd & 0.779 \\ Dy & 0.746 \\ Ho & 0.777 \\ Lu & 0.732 \\ Tm & 0.739 \\ Pr & 0.741 \\ Tm & 0.732 \\ Yb & 0.777 \\ Lu & 0.732 \\ Hf & 0.711 \\ Ta & 0.808 \\ W & 0.806 \\ T1 & 0.273 \\ \end{array}$
 | BG
(cps)
348
21.1
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2.44 | $\begin{array}{c} 0.89\\ \hline 0.89\\ \hline 0.89\\ \hline 0.89\\ \hline 0.89\\ \hline 0.81\\ 0.69\\ 1.10\\ 1.74\\ 2.24\\ 0.69\\ 1.10\\ 1.74\\ 2.24\\ 1.18\\ 0.81\\ 0.66\\ 0.84\\ 43.7\\ 0.92\\ 1.01\\ 0.77\\ 0.92\\ 1.01\\ 0.77\\ 0.67\\ 0.46\\ 0.84\\ 43.7\\ 0.92\\ 1.01\\ 0.77\\ 0.67\\ 0.46\\ 0.84\\ 0.84\\ 0.84\\ 0.84\\ 0.85\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.88\\ 0.87\\ 0.88\\ 0.87\\ 0.88\\ 0.87\\ 0.88\\ 0.87\\ 0.88\\ 0.87\\ 0.88\\ 0.87\\ 0.88\\ 0.87\\ 0.88\\ 0.87\\ 0.88\\ 0.87\\ 0.88\\ 0.88\\ 0.87\\ 0.88\\ 0.88\\ 0.87\\ 0.88\\ 0.87\\ 0.88\\ 0$
 | DIF (μ g g ⁻¹) 1.17 0.00 0.24 0.21 0.61 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.14 0.15 0.14 0.15 0.14 0.13 0.14 0.09 0.09
 | 40 µ m DIF% (%) 158 0.1 24.2 17.3 17.3 19.6 10.0 1.4 16.7 19.59 6.62 16.5 17.64 9.76 8.46 6.29 0.78 16.5 12.64 9.76 8.08 10.75 14.0 4.18 11.52 20.92 19.34 18.861 18.66 14.5 18.63 19.72 0.32 11.7 0.32 11.7 | c.sco SD (1 σ) (μgg ⁻¹) 0.296 0.554 0.074 0.356 0.198 0.118 0.224 0.253 1.060 0.190 0.567 0.190 0.567 0.190 0.667 0.190 0.667 0.190 0.666 0.108 0.108 0.112 0.99 0.0663 0.0556 0.0556 0.0556 0.0556 0.0556 0.0554 0.0554 0.054 0.063 0.063 0.065 0.127 0.070 0.093 0.625 0.148 0.039 0.127 0.770 0.707 0.708 | 8.52 (%) 15.53 15.53 9.67 24.57 16.96 24.57 16.96 9.07 14.48 47.25 24.57 16.96 9.97 14.48 5.06 9.93 15.47 9.05 15.47 9.05 15.47 9.05 15.47 9.05 15.47 9.05 15.47 9.05 15.47 9.05 15.47 16.64 7.46 16.6 4.52 9.7 10.6 4.52 9.7 16.6 4.52 9.7 16.6 4.52 9.7 16.6 4.52 <tr td=""></tr>
 | $\begin{array}{c} 2102\\ \hline \\ \hline$ | $\begin{array}{c} (\mu g g^{-1}) \\ (\mu g g^{-1}) \\ 0.002 \\ 0.002 \\ 0.002 \\ 0.003 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.003 \\ 0.037 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.002 \\ 0.006 \\ 0.002 \\ 0.006 \\ 0.001 \\ 0.006 \\ 0.001 \\ 0.006 \\ 0.001 \\ 0.006 \\ 0.001 \\ 0.006 \\ 0.001 \\ 0.006 \\ 0.001 \\ 0.006 \\ 0.001 \\ 0.005 \\ 0.001 \\ 0.003 \\ 0.001 \\ 0.003 \\ 0.001 \\ 0.005 \\ 0.001 \\ 0.002 \\ 0.005 \\ 0.001 \\ 0.002 \\ 0.005 \\ 0.001 \\ 0.002 \\ 0.005 \\ 0.001 \\ 0.002 \\ 0.005 \\ 0.001 \\ 0.002 \\ 0.005 \\ 0.001 \\ 0.002 \\ 0.005 \\ 0.001 \\ 0.002 \\ 0.005 \\ 0.001 \\ 0.002 \\ 0.005 \\ 0.001 \\ 0.001 \\ 0.005 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0$ | AV (µgg') 2.77 2.86 1.01 7.48 1.80 0.80 1.48 1.80 1.49 2.74 1.32 1.06 1.32 1.06 0.71 0.90 9.99 1.25 0.83 0.56 0.71 0.60 0.63 0.83 0.56 0.86 0.76 0.89 0.83 0.98 0.93 0.93 0.92 0.97 0.89 0.96 0.80 0.81 0.92 0.97 0.89 0.96 0.81 0.27 | DIF (µg g ⁻¹) 2.03 0.75 0.038 0.12 0.38 0.01 0.12 0.03 0.01 0.12 0.03 0.05 0.11 0.02 0.03 0.05 0.19 0.03 0.02 0.04 0.05 0.09 0.14 0.22 0.14 0.22 0.14 0.22 0.14 0.14 0.14 0.14 0.14 0.14 0.17 0.16 0.17 0.16 0.01
 | 20 µm
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275 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mugg^{-1}\right)\\ 0.203\\ 1.032\\ 0.196\\$ | RSD
(%)
7.3
36.1
19.4
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34.2
11.2
54.9
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15 | Sensitivity
(cps/ µ g g ⁻¹)
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126
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88
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1111
147
144
29
8
52
60
192
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182
203
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203
228
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31
124
124
124
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211
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197
67
207
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41
96
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216
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127 | DL (µgg ⁻¹) 0.008 0.554 0.002 0.554 0.004 0.352 0.004
 0.352 0.004 0.431 0.007 0.168 0.005 0.005 0.005 0.015 0.005 0.015 0.004 0.005 0.015 0.003 0.003 0.004 0.003 0.004 0.005 0.015 0.003 0.004 0.005 0.003 0.0040 0.005 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.012 0.012 |
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| C 0.0223 RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Mi 1.11 Cu 1.37 Zr 0.942 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.684 Ba 3.2 La 0.72 Ce 0.813 Pr 0.763 Shd 0.752 Sm 0.732 Yb<0.777
 | BG
(cops)
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21.1
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61.1
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0.00 | $\begin{array}{c} 0.89\\ \hline 0.89\\ \hline 0.89\\ \hline 0.89\\ \hline 0.89\\ \hline 0.89\\ \hline 0.80\\ \hline 0.81\\ \hline 0.60\\ \hline 0.81\\ \hline 0.60\\ \hline 0.81\\ \hline 0.60\\ \hline 0.81\\ \hline 0.60\\ \hline 0.81\\ \hline 0.67\\ \hline 0.46\\ \hline 0.81\\ \hline 0.77\\ \hline 0.67\\ \hline 0.46\\ \hline 0.81\\ \hline 0.81\\ \hline 0.89\\ \hline$
 | μ μ DIF (μ g g ⁻¹) 1.17 0.00 0.24 0.21 0.37 0.55 0.13 0.00 0.37 0.55 0.13 0.08 0.01 0.13 0.13 0.05 0.13 0.16 0.05 0.13 0.16 0.07 0.03 0.20 0.01 0.04 0.10 0.04 0.11 0.03 0.02 0.01 0.14 0.15 0.14 0.14 0.13 0.14 0.13 0.14 0.15 0.14 0.15 0.14 0.00 0.09 0.02 0.02 | | c.300 c.get SD (1 σ) (μgg ⁻¹) 0.296 0.554 0.74 0.356 0.198 0.110 0.554 0.74 0.356 0.198 0.110 0.197 0.190 0.666 0.110 0.108 0.138 0.177 0.132 0.110 0.108 0.138 0.177 0.138 0.177 0.138 0.177 0.122 0.99 0.226 0.0653 0.198 0.087 0.093 0.127 0.709 0.127 0.709 0.298 0.209
 | 8.52 (%) 15.53 9.67 15.53 9.67 16.96 24.57 16.96 20.29 14.48 8.47.25 16.09 29.4 8.84 8.84 8.64 4.2 23.0 9.057 30.64 16.64 7.86 6.02 9.7 10.67 7.16 8.43 8.64 4.2 23.0 11.1 26.58 6.02 9.7 10.6 7.46 13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8 13. | $\begin{array}{c} 2132\\ \hline \\ \hline$ | $\begin{array}{c} (\underline{\mu}\underline{g}\underline{g}^{-1})\\ 0.002\\ 0.002\\ 0.002\\ 0.003\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.003\\ 0.001\\ 0.002\\ 0.004\\ 0.002\\ 0.006\\ 0.001\\ 0.002\\ 0.006\\ 0.001\\ 0.005\\ 0.006\\ 0.001\\ 0.005\\ 0.003\\ 0.001\\ 0.003\\ 0.001\\ 0.003\\ 0.001\\ 0.005\\ 0.001\\ 0.004\\ 0.005\\ 0.001\\ 0.004\\ 0.001\\ 0.004\\ 0.001\\
0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ 0.001\\ $ | AV (µgg1) 2.77 2.86 1.01 1.48 1.80 0.80 1.48 1.80 0.82 1.44 1.49 2.74 1.32 1.06 0.71 0.90 45.9 0.99 1.25 0.89 0.83 0.56 1.97 0.603 2.98 0.76 0.89 0.83 0.56 0.72 0.89 0.83 0.78 0.72 0.89 0.83 0.98 1.03 0.92 0.92 0.92 0.92 0.89 0.81 0.27 0.89 0.81 0.25 | DIF (µg,g ⁻¹) 2.03 0.75 0.00 0.75 0.03 0.75 0.03 0.75 0.03 0.75 0.01 0.14 0.02 0.01 0.20 0.01 0.20 0.01 0.20 0.44 0.05 0.09 0.04 0.14 0.05 0.09 0.12 0.22 0.04 0.04 0.14 0.05 0.12 0.28 0.19 0.18 0.14 0.01 0.03 | 20 µm
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1 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mug\frac{g^{-1}}{g}\right)\\ 0.203\\ 1.032\\ 0.196\\ 0.2957\\
0.830\\ 0.269\\ 0.343\\ 0.364\\ 0.363\\ 0.196\\ 0.372\\ 0.101\\ 0.372\\ 0.101\\ 0.372\\ 0.101\\ 0.372\\ 0.178\\ 0.372\\ 0.101\\ 0.372\\ 0.178\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.323\\ 0.103\\ 0.003\\ 0.103\\ 0.003\\ 0.103\\ 0.003\\$ | RSD
(%)
36.1
19.4
46.18
33.71
27.7
24.4
11.2
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54.9
15.2
36.5
7.4
24.91
15.2
36.5
57.4
24.91
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15.2
15.2
15.2 | Sensitivity
(cps/ µ g g ⁻¹)
91
6
126
105
20
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7
88
35
70
111
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144
29
8
52
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228
40
31
124
31
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99 | DL (µ g g -1) 0.008 0.554 0.002 0.004 0.352 0.221 0.002 0.007 0.4359 0.002 0.006 0.431 0.007 0.4359 0.002 0.005 0.015 0.004 0.005 0.016 0.037 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.004 0.004 0.005 0.0012 0.0021 0.003 0.0021 0.0022 0.002 0.002 0.002 0.002 0.002 0.002 0.003 0.012 0.012 0.012 <td< td=""></td<> |
| B 0.0223 RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Gr 1.19 Mn 1.42 Co 0.79 Zr 2.79 Ga 1.31 Ge 0.942 As 0.74 As 0.74 Mo 0.855 Sr 45.85 Sr 0.79 Zr 0.844 Mo 0.824 Mo 0.824 Mo 0.824 Mo 0.75 Sm 0.764 Dr 0.768 Sh 0.752 Sm 0.754 Eu 0.773 Dy 0.746 Fr 0.711 Ta 0.806 W 0.806 TI 0.273 Pb 2.322 Bi 0.581 <td>BG
(cps)
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0.05 0.1 0.03 0.05 0.1 0.20 0.43 0.05 0.19 0.03 0.02 0.04 0.22 0.44 0.22 0.44 0.22 0.414 0.22 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14</td><td>20 µm
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275
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(%)
7.3
36.1
19.4
46.18
33.71
27.7
24.4
34.2
11.2
54.9
11.2
54.9
11.2
52.6
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126
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9171</td><td>DL (µgg⁻¹) 0.008 0.554 0.004 0.352 0.004 0.352 0.004 0.352 0.004 0.352 0.005 0.015 0.007 0.063 0.015 0.015 0.031 0.002 0.003 0.040 0.006 0.021 0.0025 0.0040 </td></t<></td> | BG
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2.44 | $\begin{array}{c} 0.89\\ \hline 0.89\\ \hline 0.89\\ \hline 0.89\\ \hline 0.89\\ \hline 0.81\\ 0.69\\ 1.10\\ 1.74\\ 2.24\\ 0.81\\ 0.69\\ 1.10\\ 1.74\\ 2.24\\ 1.18\\ 0.81\\ 0.66\\ 0.84\\ 43.7\\ 0.92\\ 1.01\\ 0.77\\ 0.67\\ 0.46\\ 0.84\\ 43.7\\ 0.92\\ 1.01\\ 0.77\\ 0.67\\ 0.46\\ 0.84\\ 0.84\\ 0.84\\ 0.84\\ 0.84\\ 0.84\\ 0.85\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.88\\ 0.87\\ 0.89\\ 0.85\\ 0.81\\ 0.71\\ 0.26\\ 0.25\\ 0.85\\ 0.81\\ 0.75\\ 0.85\\ 0.81\\ 0.75\\ 0.85\\ 0$
 | DIF (μ g g ⁻¹) 1.17 0.00 0.24 0.21 0.61 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.14 0.15 0.14 0.15 0.14 0.13 0.14 0.13
 | 40 µ m DIF% (%) 158 0.1 24.2 17.3 17.3 19.6 10.0 14 10.0 14 11.4 4.67 19.59 6.62 16.5 17.64 9.76 8.36 4.4 6.29 0.78 12.2 5.08 10.75 14.0 41.5 11.52 20.92 19.34 18.66 14.5 18.63 19.74 19.32 11.52 18.03 19.74 3.2 11.52 18.03 19.74 3.5 | SD (1 σ) (μg g ⁻¹) 0.296 0.554 0.074 0.356 0.198 0.118 0.224 0.253 1.060 0.190 0.567 0.190 0.567 0.190 0.567 0.190 0.666 0.110 0.108 0.138 0.177 0.112 0.949 0.556 0.063 0.0556 0.0556 0.0556 0.0556 0.0556 0.0554 0.0554 0.054 0.127 0.070 0.093 0.065 0.148 0.045 0.206 0.045 0.206 | 8.52 (%) 15.53 15.53 9.67 24.57 16.96 24.57 16.96 9.67 14.48 47.25 24.57 16.96 9.97 14.48 5.06 9.93 9.67 15.47 30.64 16.64 7.80 9.05 15.47 30.64 16.64 7.80 6.02 11.1 26.58 6.02 11.2 8.59 3.8 14.9 8.59 13.8 17.6 8.59 13.8 17.6 8.96 14.9 8.59 13.8 17.6 8.96 14.9 <t< td=""><td>$\begin{array}{c} 2102\\ \hline \\ \hline$</td><td>μ μ μ μ μ μ μ μ 0.002 0.002 0.002 0.003 0.094 0.005 0.005 0.003 0.035 0.005 0.003 0.037 0.003 0.001 0.001 0.001 0.002 0.004 0.001 0.005 0.006 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.004 0.001 0.001 0.002 0.004 0.001 0.001 0.003 0.001 0.001 0.003 0.001 0.004 0.001 0.005 0.001 0.005 0.001 0.005 0.001 0.004 0.001 0.002 0.001 0.004 0.001</td><td>AV (µgg') 2.77 2.86 1.01 7.48 1.80 0.80 1.48 1.80 1.24 1.32 1.32 7.06 0.77 0.90 9.99 1.25 0.83 0.56 0.77 0.60 0.83 0.56 0.83 0.56 0.86 0.76 0.86 0.76 0.89 0.83 0.93 0.92 0.97 0.89 0.83 0.98 0.92 0.97 0.89 0.86 0.76 0.89 0.92 0.97 0.89 0.96 0.81 0.27 2.65 0.59</td><td>DIF (µg g⁻¹) 2.03 0.75 0.00 0.38 0.11 0.02 0.03 0.01 0.12 0.03 0.01 0.12 0.03 0.05 0.1 0.03 0.05 0.1 0.20 0.43 0.05 0.19 0.03 0.02 0.04 0.22 0.44 0.22 0.44 0.22 0.414 0.22 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14</td><td>20 µm
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275</td><td>$\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mugg^{-1}\right)\\ 0.203\\ 1.032\\ 0.196\\$</td><td>RSD
(%)
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46.18
33.71
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24.4
34.2
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37</td><td>Sensitivity
(cps/ µ g g⁻¹)
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9171</td><td>DL (µgg⁻¹) 0.008 0.554 0.004 0.352 0.004 0.352 0.004 0.352 0.004 0.352 0.005 0.015 0.007 0.063 0.015 0.015 0.031 0.002 0.003 0.040 0.006 0.021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021
 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0025 0.0040 </td></t<> | $\begin{array}{c} 2102\\ \hline \\ \hline$ | μ μ μ μ μ μ μ μ 0.002 0.002 0.002 0.003 0.094 0.005 0.005 0.003 0.035 0.005 0.003 0.037 0.003 0.001 0.001 0.001 0.002 0.004 0.001 0.005 0.006 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.004 0.001 0.001 0.002 0.004 0.001 0.001 0.003 0.001 0.001 0.003 0.001 0.004 0.001 0.005 0.001 0.005 0.001 0.005 0.001 0.004 0.001 0.002 0.001 0.004 0.001 | AV (µgg') 2.77 2.86 1.01 7.48 1.80 0.80 1.48 1.80 1.24 1.32 1.32 7.06 0.77 0.90 9.99 1.25 0.83 0.56 0.77 0.60 0.83 0.56 0.83 0.56 0.86 0.76 0.86 0.76 0.89 0.83 0.93 0.92 0.97 0.89 0.83 0.98 0.92 0.97 0.89 0.86 0.76 0.89 0.92 0.97 0.89 0.96 0.81 0.27 2.65 0.59 | DIF (µg g ⁻¹) 2.03 0.75 0.00 0.38 0.11 0.02 0.03 0.01 0.12 0.03 0.01 0.12 0.03 0.05 0.1 0.03 0.05 0.1 0.20 0.43 0.05 0.19 0.03 0.02 0.04 0.22 0.44 0.22 0.44 0.22 0.414 0.22 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14 | 20 µm
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19.4
46.18
33.71
27.7
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37 | Sensitivity
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9171 | DL (µgg ⁻¹) 0.008 0.554 0.004 0.352 0.004 0.352 0.004 0.352 0.004 0.352 0.005 0.015 0.007 0.063 0.015 0.015 0.031 0.002 0.003 0.040 0.006 0.021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021 0.0021
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| C 0.0223 RV (μgg ⁻¹) Sc 0.74 Ti 3.61 V 1.01 Cr 1.19 Mn 1.42 Co 0.79 Mi 1.1 Cu 1.37 Zr 0.62 As 0.74 Rb 0.855 Sr 45.8 Y 0.79 Zr 0.848 Nb 0.824 Mo 0.82 Ge 0.813 Pr 0.768 Cd 0.56 Sm 0.752 Sm 0.752 Sm 0.746 Ho 0.732 Yb 0.771 Gd 0.732 Yb 0.732 Yb 0.740 Ti 0.8086 W 0.8086 Th 0.740
 | BG
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1.11 | AV (μg g ⁻¹) 1.91 3.61 0.77 0.98 0.81 0.60 1.10 1.74 2.24 0.81 0.66 0.84 0.77 0.77 0.77 0.77 0.67 0.46 0.83 0.77 0.77 0.73 0.83 0.86 0.85 0.89 0.89 0.88 0.871 0.711 0.73 0.86 0.85 0.89 0.89 0.88 0.871 0.234 0.871 0.234 0.87
 | $\begin{array}{c} 0.00\\ \hline 0.00\\ \hline 0.00\\ 0.24\\ 0.21\\ 0.21\\ 0.24\\ 0.21\\ 0.24\\ 0.21\\ 0.24\\ 0.21\\ 0.24\\ 0.21\\ 0.24\\ 0.37\\ 0.55\\ 0.13\\ 0.08\\ 0.01\\ 0.13\\ 0.13\\ 0.13\\ 0.13\\ 0.10\\ 0.05\\ 0.13\\ 0.10\\ 0.05\\ 0.13\\ 0.10\\ 0.05\\ 0.13\\ 0.10\\ 0.05\\ 0.13\\ 0.10\\ 0.05\\ 0.13\\ 0.10\\ 0.01\\ 0.01\\ 0.01\\ 0.01\\ 0.01\\ 0.01\\ 0.01\\ 0.01\\ 0.01\\ 0.01\\ 0.01\\ 0.01\\ 0.01\\ 0.01\\ 0.01\\ 0.01\\ 0.01\\ 0.00\\ 0.02\\
0.02\\ 0$ | | 0.000 μg g ⁻¹) 0.296 0.554 0.74 0.356 0.198 0.198 0.198 0.198 0.198 0.198 0.198 0.190 0.660 0.190 0.666 0.108 0.138 0.177 0.132 0.110 0.108 0.138 0.177 0.130 0.177 0.138 0.177 0.138 0.177 0.122 0.993 0.055 0.198 0.0653 0.198 0.0655 0.148 0.093 0.0455 0.298 0.445 0.290 0.663 | 8.52 (%) 15.53 9.67 15.53 9.67 16.96 24.57 16.96 9.87 16.96 9.97 14.48 8.47.25 16.09 29.4 8.84 10.87 15.42 20.7 16.99 20.7 8.84 8.84 8.84 8.84 8.84 4.2 23.0 9.05 30.64 16.64 7.80 8.84 8.23 8.64 4.2 23.0 11.1 26.58 6.02 9.7 7.46 16.8 13.8 17.1 13.8 13.8 13.8 1
 | $\begin{array}{c} 2132\\ \hline \\ \hline$ | $\begin{array}{c} (\underline{\mu}\underline{g}\underline{g}^{-1})\\ 0.002\\ 0.002\\ 0.002\\ 0.003\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.005\\ 0.003\\ 0.033\\ 0.035\\ 0.005\\ 0.005\\ 0.005\\ 0.000\\ 0.001\\ $ | AV (µgg1) 2.77 2.86 1.01 1.48 1.80 0.80 1.48 1.80 0.80 1.24 1.32 1.06 2.77 2.86 0.90 1.24 1.32 1.06 0.71 0.90 45.9 0.89 0.83 0.56 0.89 0.83 0.663 2.98 0.76 0.86 0.86 0.72 0.89 0.83 0.98 1.03 0.92 0.92 0.97 0.89 0.81 0.27 0.89 0.861 0.27 0.89 0.81 0.27 0.89 0.86 | DIF (µg,g ⁻¹) 2.03 0.75 0.00 0.75 0.03 0.75 0.01 0.229 0.38 0.01 0.14 0.029 0.38 0.01 0.12 0.03 0.01 0.12 0.20 0.40 0.41 0.02 0.03 0.02 0.03 0.22 0.04 0.14 0.05 0.09 0.12 0.22 0.24 0.14 0.16 0.22 0.23 0.18 0.11 0.02 0.12 0.13 0.11 0.12 0.13 0.14 0.15 0.16 <td>20 µm
20 µm
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225</td> <td>$\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mugg^{-1}\right)\\ 0.203\\ 1.032\\ 0.196\\ 0.2957\\ 0.830\\ 0.269\\ 0.343\\ 0.364\\ 0.363\\ 0.101\\ 0.372\\ 0.101\\ 0.372\\ 0.101\\ 0.372\\ 0.101\\ 0.372\\ 0.178\\ 0.372\\ 0.101\\ 0.372\\ 0.323\\ 0.491\\ 0.233\\ 0.491\\ 0.224\\ 0.387\\ 0.323\\ 0.491\\ 0.224\\ 0.387\\ 0.323\\ 0.491\\ 0.225\\ 0.103\\ 0.102\\ 0.107\\ 0.215\\ 0.0099\\ 0.103\\ 0.142\\ 0.387\\ 0.0099\\ 0.103\\ 0.142\\ 0.333\\ 0.235\\ 0.161\\ 0.197\\ 0.083\\ 0.235\\ 0.161\\ 0.197\\ 0.083\\ 0.235\\ 0.076\\ 0.298\\ 0.043\\ 0.098\\ 0.008\\ 0.0$</td> <td>RSD
(%)
366.1
19.4
46.18
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11.2
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11.22
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17.3</td> <td>Sensitivity
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192
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52
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192
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182
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21</td> <td>DL (µ g g -1) 0.008 0.554 0.002 0.004 0.352 0.2231 0.006 0.431 0.007 0.168 0.002 0.006 0.431 0.007 0.168 0.002 0.005 0.015 0.004 0.005 0.016 0.037 0.002 0.003 0.002 0.003 0.021
0.002 0.002 0.002 0.003 0.021 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.003 0.012 0.012 0.012 0.01</td> | 20 µm
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225 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\ \left(\mugg^{-1}\right)\\ 0.203\\ 1.032\\ 0.196\\ 0.2957\\ 0.830\\ 0.269\\ 0.343\\ 0.364\\ 0.363\\ 0.101\\ 0.372\\ 0.101\\ 0.372\\ 0.101\\ 0.372\\ 0.101\\ 0.372\\ 0.178\\ 0.372\\ 0.101\\ 0.372\\ 0.323\\ 0.491\\ 0.233\\ 0.491\\ 0.224\\ 0.387\\ 0.323\\ 0.491\\ 0.224\\ 0.387\\ 0.323\\ 0.491\\ 0.225\\ 0.103\\ 0.102\\ 0.107\\ 0.215\\ 0.0099\\ 0.103\\ 0.142\\ 0.387\\ 0.0099\\ 0.103\\ 0.142\\ 0.333\\ 0.235\\ 0.161\\ 0.197\\ 0.083\\ 0.235\\ 0.161\\ 0.197\\ 0.083\\ 0.235\\ 0.076\\ 0.298\\ 0.043\\ 0.098\\ 0.008\\ 0.0$ | RSD
(%)
366.1
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46.18
33.71
27.7
24.4
11.2
54.9
52.6
21.2
25.4
9
36.5
11.22
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57.4
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17.3 | Sensitivity
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182
203
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221
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21 | DL (µ g g -1) 0.008 0.554 0.002 0.004 0.352 0.2231 0.006 0.431 0.007 0.168
 0.002 0.006 0.431 0.007 0.168 0.002 0.005 0.015 0.004 0.005 0.016 0.037 0.002 0.003 0.002 0.003 0.021 0.002 0.002 0.002 0.003 0.021 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.003 0.012 0.012 0.012 0.01 |

RV: reference value of Jochum *et al.* (2011), AV: averaged value of analytical result, DIF: difference from reference value, DIF%: percentage of DIF against RV, SD: standard deviation of analytical values, RSD: relative standard deviation of analytical values, LD: lower limit of detection.

*Values shown by *Italic* are reference values. Because of low background-signal count ratio, results of those elements were not determined in several sets, thus those values were extrapolated from other sets of analyses (*N=5*).

Table 4 Quantitative results of replicate analyses (N=5) for NIST 613 determined using four pit diameters (80, 40, 20 and 10 μ m).

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 | 515 | 40 μm | 00 (1 -)
 | | 0 111 11 | |
| | RV

 | BG | AV

 | DIF
 | DIF% | $SD(1\sigma)$ | RSD
 | Sensitivity | DL
 | AV
 | DIF | DIF% | $SD(1\sigma)$
 | RSD | Sensitivity | DL |
| | $(\mu g g^{-1})$

 | (cps) | $(\mu g g^{-1})$

 | $(\mu g g^{-1})$
 | (%) | $(\mu g g^{-1})$ | (%)
 | (cps/μgg ⁻¹) | $(\mu g g^{-1})$
 | $(\mu g g^{-1})$
 | $(\mu g g^{-1})$ | (%) | $(\mu g g^{-1})$
 | (%) | (cps/ µ g g ^{−1}) | $(\mu g g^{-1})$ |
| Sc | 39.9

 | 227 | 34.5

 | 54
 | 13 54 | 1 2 9 | 3 75
 | 1000 | 0.001
 | 36.7
 | 3.2 | 8 1 2 | 0.85
 | 2.31 | 251 | 0.001 |
| т: | 44

 | 11 1 | 20.0

 | 6.0
 | 12.6 | 1.20 | 4.07
 | 57 | 0.001
 | 26.7
 | 7.2 | 16.5 | 0.00
 | 7 4 4 | 14 | 0.001 |
| | 44

 | 11.1 | 38.0

 | 0.0
 | 13.0 | 1.09 | 4.57
 | 57 | 0.021
 | 30.7
 | 7.5 | 10.5 | 2.73
 | 7.44 | 14 | 0.025 |
| V | 38.8

 | 22.2 | 38.8

 | 0.0
 | 0.08 | 1.86 | 4.81
 | 986 | 0.001
 | 38.2
 | 0.6 | 1.56 | 0.97
 | 2.54 | 232 | 0.001 |
| Cr | 36.4

 | 47.8 | 38.7

 | 2.3
 | 6.37 | 2.41 | 6.21
 | 94 | 0.014
 | 34.7
 | 1.7 | 4.71 | 2.20
 | 6.33 | 24 | 0.017 |
| Mn | 38.7

 | 1103 | 42.1

 | 3.4
 | 8.86 | 3.01 | 7.14
 | 1040 | 0.001
 | 36.9
 | 1.8 | 4.66 | 1.30
 | 3.53 | 272 | 0.001 |
| Co | 35.5

 | 10.7 | 35.1

 | 0.4
 | 1.01 | 1.36 | 3.99
 | 803 | 0.001
 | 35.1
 | 0.4 | 1 15 | 1.06
 | 3.03 | 211 | 0.001 |
| 00 | 33.5

 | 10.7 | 33.1

 | 0.4
 | 1.01 | 1.30 | 3.00
 | 093 | 0.001
 | 33.1
 | 0.4 | 1.15 | 1.00
 | 3.03 | 211 | 0.001 |
| Ni | 38.8

 | 141 | 39.3

 | 0.5
 | 1.34 | 1.71 | 4.35
 | 171 | 0.007
 | 39.5
 | 0.7 | 1.68 | 0.92
 | 2.32 | 42 | 0.008 |
| Cu | 37.8

 | 113 | 37.9

 | 0.1
 | 0.29 | 1.07 | 2.83
 | 430 | 0.003
 | 39.6
 | 1.8 | 4.69 | 0.66
 | 1.66 | 104 | 0.002 |
| Zn | 39.1

 | 33.3 | 38.5

 | 0.6
 | 16 | 1.33 | 3 4 6
 | 64 | 0.021
 | 40.3
 | 12 | 2 96 | 2 34
 | 5.80 | 15 | 0.026 |
| 2.11 | 00.1

 | 4.0 | 00.0

 | 1.0
 | 0.10 | 1.00 | 0.40
 | 701 | 0.021
 | 40.0
 | 0.5 | 2.00 | 1.04
 | 0.00 | 100 | 0.020 |
| Ga | 36.9

 | 4.0 | 38.1

 | 1.2
 | 3.18 | 1.19 | 3.12
 | /81 | 0.002
 | 39.4
 | 2.5 | 0.83 | 1.04
 | 2.04 | 182 | 0.001 |
| Ge | 36.1

 | 247 | 40.7

 | 4.6
 | 12.7 | 2.52 | 6.20
 | 248 | 0.006
 | 41.7
 | 5.6 | 15.6 | 1.60
 | 3.84 | 59 | 0.006 |
| As | 35.7

 | 147 | 35.7

 | 0.0
 | 0.05 | 1.85 | 5 1 9
 | 86 | 0.016
 | 36.9
 | 12 | 3 50 | 2.93
 | 7.92 | 20 | 0.016 |
| Dh | 21.4

 | 76 | 21.0

 | 0.5
 | 1 55 | 1.01 | 2 17
 | 1025 | 0.001
 | 22.0
 | 0.6 | 1 0 2 | 0.60
 | 1 00 | 242 | 0.001 |
| RD - | 31.4

 | 70 | 31.9

 | 0.5
 | 1.55 | 1.01 | 3.17
 | 1025 | 0.001
 | 32.0
 | 0.0 | 1.02 | 0.00
 | 1.00 | 242 | 0.001 |
| Sr | /8.4

 | 1.3 | /1.4

 | 7.0
 | 8.89 | 1.94 | 2.72
 | 1483 | 0.001
 | 11.3
 | 1.1 | 1.35 | 1.77
 | 2.29 | 334 | 0.001 |
| Y | 38.3

 | 2.7 | 32.8

 | 5.5
 | 14.3 | 1.47 | 4.47
 | 1772 | 0.001
 | 37.0
 | 1.3 | 3.43 | 1.01
 | 2.72 | 428 | 0.001 |
| 7r | 37.9

 | 4.0 | 33.2

 | 47
 | 12.3 | 1.06 | 3 1 9
 | 907 | 0.001
 | 34.4
 | 3.5 | 9 24 | 0.75
 | 217 | 236 | 0.001 |
| NIL | 20.0

 | 0.0 | 27.0

 | 1.0
 | 4.0 | 1 0 1 | 1 00
 | 1406 | 0.001
 | 25.4
 | 2.5 | 0.0 | 0.96
 | 2 4 2 | 205 | 0.001 |
| IND | 30.9

 | 0.0 | 37.0

 | 1.9
 | 4.0 | 1.01 | 4.00
 | 1490 | 0.001
 | 33.4
 | 3.5 | 9.0 | 0.00
 | 2.40 | 365 | 0.001 |
| Mo | 37.4

 | 0.0 | 30.7

 | 0.7
 | 2.00 | 1.95 | 5.33
 | 200 | 0.005
 | 37.0
 | 0.4 | 0.96 | 0.68
 | 1.83 | 62 | 0.003 |
| Cd | 28.1

 | 2.5 | 29.2

 | 1.1
 | 3.78 | 1.28 | 4.38
 | 63 | 0.019
 | 30.6
 | 2.5 | 8.78 | 1.81
 | 5.93 | 14 | 0.018 |
| Sn | 38.6

 | 33.3 | 37.7

 | 0.9
 | 2.29 | 1.66 | 4.40
 | 510 | 0.002
 | 39.5
 | 0.9 | 2.39 | 1.92
 | 4.86 | 120 | 0.002 |
| Sh | 34.7

 | 8.0 | 34.7

 | 0.0
 | 0 14 | 1 53 | 4 40
 | 600 | 0.002
 | 36.1
 | 14 | 4 16 | 1 54
 | 4 27 | 138 | 0.001 |
| 0.0 | 40.7

 | 0.0 | 41.4

 | 1.0
 | 0.14 | 1.00 | 0.14
 | 1000 | 0.002
 | 41.0
 | 1.7 | 4.10 | 0.70
 | 1.00 | 100 | 0.001 |
| US | 42.7

 | 203 | 41.4

 | 1.3
 | 3.06 | 1.30 | 3.14
 | 1630 | 0.001
 | 41.0
 | 1.7 | 3.91 | 0.70
 | 1.09 | 420 | 0.001 |
| Ba | 39.3

 | 0.0 | 38.6

 | 0.7
 | 1.89 | 1.58 | 4.11
 | 238 | 0.005
 | 38.9
 | 0.4 | 1.0 | 2.16
 | 5.54 | 54 | 0.005 |
| La | 36

 | 2.7 | 34.0

 | 2.0
 | 5.65 | 1.55 | 4.56
 | 2007 | 0.001
 | 35.0
 | 1.0 | 2.82 | 0.97
 | 2.78 | 489 | 0.001 |
| Ce | 38.4

 | 13 | 38.3

 | 0.1
 | 0.18 | 1.98 | 5 1 5
 | 2068 | 0.001
 | 37.9
 | 0.5 | 1 25 | 0.74
 | 1 95 | 474 | 0.001 |
| D- | 37.0

 | 13 | 377

 | 0.1
 | 0.62 | 1.00 | 5 1 2
 | 2340 | 0.000
 | 37.0
 | 0.0 | 0.1 | 1.99
 | 3.25 | 566 | 0.001 |
| Pr
N | 37.3

 | 1.0 | 01.1

 | 1.0
 | 0.03 | 1.93 | 0.12
 | 2049 | 0.000
 | 37.9
 | 0.0 | 0.1 | 1.23
 | 3.20 | 000 | 0.001 |
| Nd | 30.0

 | 0.0 | 33.9

 | 1.0
 | 4.41 | 0.95 | 2.80
 | 421 | 0.002
 | 34.6
 | 0.9 | 2.46 | 1.58
 | 4.55 | 99 | 0.005 |
| Sm | 37.7

 | 0.0 | 34.3

 | 3.4
 | 9.15 | 2.00 | 5.83
 | 377 | 0.003
 | 40.1
 | 2.4 | 6.25 | 1.45
 | 3.63 | 81 | 0.004 |
| Eu | 35.6

 | 0.0 | 33.4

 | 2.2
 | 6,17 | 1.79 | 5.36
 | 1408 | 0.001
 | 38.1
 | 2.5 | 6,97 | 0.99
 | 2.59 | 300 | 0.001 |
| Gd | 373

 | 44 | 33.0

 | 43
 | 11 48 | 1 4 2 | 4 31
 | 416 | 0.002
 | 38.8
 | 1.5 | 415 | 1 84
 | 4 73 | 92 | 0 004 |
| TL | 27.6

 | 1.2 | 20.0

 | 1.0
 | 12.00 | 1.74 | 4 70
 | 0700 | 0.000
 | 26.1
 | 1.5 | 4.07 | 1.64
 | 4 60 | 662 | 0.000 |
| | 37.0

 | 1.3 | 32.1

 | 4.9
 | 13.00 | 1.55 | 4./Z
 | 2/00 | 0.000
 | 30.1
 | 6.1 | 4.07 | 1.04
 | 4.00 | 003 | 0.000 |
| Dy | 35.5

 | 0.8 | 30.7

 | 4.8
 | 13.6 | 1.63 | 5.32
 | 679 | 0.001
 | 35.2
 | 0.3 | 0.98 | 1.43
 | 4.07 | 158 | 0.002 |
| Ho | 38.3

 | 2.7 | 33.5

 | 4.8
 | 12.6 | 1.73 | 5.16
 | 2601 | 0.000
 | 39.7
 | 1.4 | 3.69 | 0.94
 | 2.37 | 599 | 0.001 |
| Fr | 38

 | 17 | 32.8

 | 52
 | 13 58 | 1.63 | 4 95
 | 896 | 0.001
 | 39.6
 | 16 | 4 33 | 1 1 4
 | 287 | 204 | 0.001 |
| Tm | 26.0

 | 2.2 | 21.6

 | 5.2
5.2
 | 14.20 | 1.00 | 4.40
 | 2055 | 0.000
 | 20.5
 | 17 | 4.56 | 1.42
 | 2 71 | 620 | 0.000 |
| | 30.0

 | 2.2 | 31.0

 | J.Z
 | 14.20 | 1.42 | 4.43
 | 2000 | 0.000
 | 30.5
 | 1.7 | 4.50 | 1.45
 | 3.71 | 039 | 0.000 |
| Yb | 39.2

 | 1.1 | 32.4

 | 6.8
 | 17.3 | 1.18 | 3.65
 | 634 | 0.001
 | 39.6
 | 0.4 | 0.91 | 1.73
 | 4.38 | 140 | 0.002 |
| Lu | 37

 | 2.2 | 34.1

 | 2.9
 | 7.9 | 0.74 | 2.18
 | 2621 | 0.000
 | 35.7
 | 1.3 | 3.51 | 1.13
 | 3.16 | 673 | 0.000 |
| Hf | 36.7

 | 44 | 33.7

 | 3.0
 | 8 16 | 1 45 | 4 31
 | 795 | 0.001
 | 37.8
 | 11 | 3.08 | 1.08
 | 2 87 | 193 | 0.002 |
| т. | 30.7

 | 7.7 | 33.7

 | 4.0
 | 10.10 | 1.40 | 2.00
 | 0607 | 0.001
 | 20.0
 | 1.1 | 1.00 | 1.00
 | 2.07 | 605 | 0.002 |
| Ta | 37.0

 | 0.0 | 33.0

 | 4.0
 | 10.51 | 1.32 | 3.92
 | 2007 | 0.000
 | 36.Z
 | 0.6 | 1.05 | 1.07
 | 2.01 | 635 | 0.000 |
| W | 38

 | 2.2 | 37.6

 | 0.4
 | 1.12 | 1.86 | 4.95
 | 604 | 0.002
 | 42.8
 | 4.8 | 12.69 | 1.32
 | 3.09 | 130 | 0.001 |
| TI | 14.9

 | 3.3 | 15.9

 | 1.0
 | 6.4 | 0.65 | 4.10
 | 1496 | 0.001
 | 17.2
 | 2.3 | 15.25 | 0.87
 | 5.07 | 313 | 0.000 |
| Ph | 38 57

 | 28.9 | 40.0

 | 14
 | 3 75 | 1 04 | 2.60
 | 1061 | 0.001
 | 427
 | 41 | 10 71 | 1 40
 | 3 27 | 231 | 0.001 |
| D: | 20.2

 | 20.0 | 26.4

 | 6.2
 | 20.6 | 0.02 | 2.00
 | 1541 | 0.001
 | 26.0
 | 6.6 | 217 | 1.40
 | 2 02 | 250 | 0.001 |
| - | 30.2

 | 3.3 | 30.4

 | 0.2
 | 20.0 | 0.93 | 2.55
 | 1341 | 0.001
 | 30.8
 | 0.0 | 21.7 | 1.04
 | 2.03 | 300 | 0.000 |
| Th | 37.79

 | 2.2 | 32.9

 | 4.8
 | 12.83 | 1.42 | 4.30
 | 2249 | 0.000
 | 37.7
 | 0.1 | 0.15 | 0.74
 | 1.96 | 503 | 0.000 |
| U | 37.38

 | 8.9 | 36.0

 | 1.3
 | 3.61 | 1.06 | 2.95
 | 2466 | 0.001
 | 36.5
 | 0.9 | 2.49 | 0.73
 | 2.01 | 539 | 0.001 |
| |

 | |

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 | | |
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| |

 | |

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 | | |
 | | | |
| |

 | |

 |
 | 20 µm | |
 | |
 |
 | | 10 μm |
 | | | |
| | RV

 | BG | AV

 | DIF
 | 20 μm
DIF% | $SD(1\sigma)$ | RSD
 | Sensitivity | DL
 | AV
 | DIF | 10 μm
DIF% | SD (1σ)
 | RSD | Sensitivity | DL |
| | RV

 | BG | AV

 | DIF
 | 20 μm
DIF% | $SD(1\sigma)$ | RSD
 | Sensitivity | DL
 | AV
 | DIF | 10 μm
DIF% | SD (1σ)
 | RSD | Sensitivity | DL |
| | RV
(μgg ⁻¹)

 | BG
(cps) | ΑV
(μgg ⁻¹)

 | DIF
(µgg ⁻¹)
 | 20 μm
DIF%
(%) | SD (1 σ)
(μgg ⁻¹) | RSD
(%)
 | Sensitivity
(cps/µgg ⁻¹) | DL
(µgg ⁻¹)
 | ΑV
(μgg ⁻¹)
 | DIF
(µgg ⁻¹) | 10 μm
DIF%
(%) | SD (1 σ)
($\mu g g^{-1}$)
 | RSD
(%) | Sensitivity
(cps/µgg ⁻¹) | DL
(µgg ⁻¹) |
| Sc | RV
(μgg ⁻¹)
39.9

 | BG
(cps)
227 | AV
(μgg ⁻¹)
38.1

 | DIF
(µgg ⁻¹)
1.8
 | 20 μm
DIF%
(%)
4.6 | SD (1 σ)
(μ g g ⁻¹)
1.24 | RSD
(%)
3.25
 | Sensitivity
(cps/μgg ⁻¹)
114 | DL
(µgg ⁻¹)
0.003
 | ΑV
(μgg ⁻¹)
39.7
 | DIF
(µgg ⁻¹)
0.2 | 10 μm
DIF%
(%)
0.5 | SD (1 σ)
(μ g g ⁻¹)
2.35
 | RSD
(%)
5.91 | Sensitivity
(cps/μgg ⁻¹)
59 | DL
(μgg ⁻¹)
0.004 |
| Sc
Ti | RV
(μgg ⁻¹)
39.9
44

 | BG
(cps)
227
11.1 | AV
(µgg ⁻¹)
38.1
42.6

 | DIF
$(\mu g g^{-1})$
1.8
1.4
 | 20 μm
DIF%
(%)
4.6
3.1 | SD (1σ)
$(\mu g g^{-1})$
1.24
1.72 | RSD
(%)
3.25
4.0
 | Sensitivity
$(cps/\mu g g^{-1})$
114
6 | DL
(µgg ⁻¹)
0.003
0.082
 | ΑV
(μgg ⁻¹)
39.7
40.1
 | DIF
$(\mu g g^{-1})$
0.2
3.9 | 10 μm
DIF%
(%)
0.5
9.0 | SD (1 σ)
(μ g g ⁻¹)
2.35
4.38
 | RSD
(%)
5.91
10.9 | Sensitivity
(cps/ μ gg ⁻¹)
59
3 | DL
(µgg ⁻¹)
0.004
0.180 |
| Sc
Ti
V | RV
($\mu g g^{-1}$)
39.9
44
38.8

 | BG
(cps)
227
11.1
22.2 | AV
(μgg ⁻¹)
38.1
42.6
42.7

 | DIF
$(\mu g g^{-1})$
1.8
1.4
3.9
 | 20 μm
DIF%
(%)
4.6
3.1
10.2 | SD (1σ)
$(\mu g g^{-1})$
1.24
1.72
1.67 | RSD
(%)
3.25
4.0
3.90
 | Sensitivity
(cps/μgg ⁻¹)
114
6
101 | DL
(µgg ⁻¹)
0.003
0.082
0.001
 | AV
$(\mu g g^{-1})$
39.7
40.1
41.3
 | DIF
$(\mu g g^{-1})$
0.2
3.9
2.5 | 10 μm
DIF%
(%)
0.5
9.0
6.6 | SD (1σ)
$(\mu g g^{-1})$
2.35
4.38
2.10
 | RSD
(%)
5.91
10.9
5.08 | Sensitivity
$(cps/\mu g g^{-1})$
59
3
59
59 | DL
(μgg ⁻¹)
0.004
0.180
0.005 |
| Sc
Ti
V
Cr | RV
$(\mu g g^{-1})$
39.9
44
38.8
36.4

 | BG
(cps)
227
11.1
22.2
47.8 | AV
$(\mu g g^{-1})$
38.1
42.6
42.7
36.7

 | DIF
$(\mu g g^{-1})$
1.8
1.4
3.9
0.3
 | 20 μm
DIF%
(%)
4.6
3.1
10.2
0.77 | SD (1σ)
$(\mu g g^{-1})$
1.24
1.72
1.67
2.18 | RSD
(%)
3.25
4.0
3.90
5.95
 | Sensitivity
$\frac{(cps/\mu g g^{-1})}{114}$ 6 101 11 | DL
(μ g g ⁻¹)
0.003
0.082
0.001
0.034
 | AV
$(\mu g g^{-1})$
39.7
40.1
41.3
39.2
 | DIF
$(\mu g g^{-1})$
0.2
3.9
2.5
2.8 | 10 μm
DIF%
(%)
0.5
9.0
6.6
7.6 | SD (1σ)
$(\mu g
g^{-1})$
2.35
4.38
2.10
1.45 | RSD
(%)
5.91
10.9
5.08
3.70 | Sensitivity
$\frac{(cps/\mu g g^{-1})}{59}$ 3 59 6 | DL
$(\mu g g^{-1})$
0.004
0.180
0.005
0.078 |
| Sc
Ti
V
Cr | RV
$(\mu g g^{-1})$
39.9
44
38.8
36.4
20.7

 | BG
(cps)
227
11.1
22.2
47.8
1102 | AV
$(\mu g g^{-1})$
38.1
42.6
42.7
36.7
26.6

 | DIF
(μ g g ⁻¹)
1.8
1.4
3.9
0.3
2.1
 | 20 μm
DIF%
(%)
4.6
3.1
10.2
0.77 | SD (1σ)
$(\mu g g^{-1})$
1.24
1.72
1.67
2.18 | RSD
(%)
3.25
4.0
3.90
5.95
 | Sensitivity
(cps/μgg ⁻¹)
114
6
101
11 | $\begin{array}{c} \text{DL} \\ (\mu \text{g g}^{-1}) \\ 0.003 \\ 0.082 \\ 0.001 \\ 0.034 \\ 0.002 \end{array}$
 | AV
$(\mu g g^{-1})$
39.7
40.1
41.3
39.2
20.0
 | DIF
(μ g g ⁻¹)
0.2
3.9
2.5
2.8 | 10 μm
DIF%
(%)
0.5
9.0
6.6
7.6 | SD (1σ)
$(\mu g g^{-1})$
2.35
4.38
2.10
1.45
4.60
 | RSD
(%)
5.91
10.9
5.08
3.70 | Sensitivity
$(cps/\mu g g^{-1})$
59
3
59
6
70 | DL
(μg g ⁻¹)
0.004
0.180
0.005
0.078 |
| Sc
Ti
V
Cr
Mn | RV
$(\mu g g^{-1})$
39.9
44
38.8
36.4
38.7

 | BG
(cps)
227
11.1
22.2
47.8
1103 | AV
$(\mu g g^{-1})$
38.1
42.6
42.7
36.7
36.6

 | DIF
(μ g g ⁻¹)
1.8
1.4
3.9
0.3
2.1
 | 20 μm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6 | SD (1σ)
(μ g g ⁻¹)
1.24
1.72
1.67
2.18
1.84 | RSD
(%)
3.25
4.0
3.90
5.95
5.04
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132 | DL
$(\mu g g^{-1})$
0.003
0.082
0.001
0.034
0.002
 | AV
$(\mu g g^{-1})$
39.7
40.1
41.3
39.2
39.8
39.8
 | DIF
(μ gg ⁻¹)
0.2
3.9
2.5
2.8
1.1 | 10 μm
DIF%
(%)
0.5
9.0
6.6
7.6
2.8 | SD (1σ)
($\mu g g^{-1}$)
2.35
4.38
2.10
1.45
4.60
 | RSD
(%)
5.91
10.9
5.08
3.70
11.57 | Sensitivity
(cps/µgg ⁻¹)
59
3
59
6
70 | DL
(µgg ⁻¹)
0.004
0.180
0.005
0.078
0.003 |
| Sc
Ti
V
Cr
Mn
Co | RV
(µgg ⁻¹)
39.9
44
38.8
36.4
38.7
35.5

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7 | AV
$(\mu g g^{-1})$
38.1
42.6
42.7
36.7
36.6
35.5

 | $ DIF (\mu g g^{-1}) 1.8 1.4 3.9 0.3 2.1 0.0 0.0 1 $
 | 20 μm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mu_{gg}^{-1}) \\ 1.24 \\ 1.72 \\ 1.67 \\ 2.18 \\ 1.84 \\ 0.93 \end{array}$ | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99 | $\begin{array}{c} \text{DL} \\ (\mu \text{g} \text{g}^{-1}) \\ 0.003 \\ 0.082 \\ 0.001 \\ 0.034 \\ 0.002 \\ 0.002 \end{array}$
 | AV
$(\mu g g^{-1})$
39.7
40.1
41.3
39.2
39.8
37.0
 | DIF
($\mu g g^{-1}$)
0.2
3.9
2.5
2.8
1.1
1.5 | 10 μm
DIF%
(%)
0.5
9.0
6.6
7.6
2.8
4.1 | $\begin{array}{c} \text{SD} (1\sigma) \\
(\mu\text{g}\text{g}^{-1}) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \end{array}$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31 | Sensitivity
(cps/µgg ⁻¹)
59
3
59
6
70
55 | DL
(µgg ⁻¹)
0.004
0.180
0.005
0.078
0.003
0.005 |
| Sc
Ti
V
Cr
Mn
Co
Ni | RV
$(\mu g g^{-1})$
39.9
44
38.8
36.4
38.7
35.5
38.8

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141 | AV
(μ_{gg}^{-1})
38.1
42.6
42.7
36.7
36.6
35.5
43.8

 | $\begin{array}{c} \text{DIF} \\ (\mu \text{g} \text{g}^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \end{array}$
 | 20 μm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\text{g}\text{g}^{-1}) \\ 1.24 \\ 1.72 \\ 1.67 \\ 2.18 \\ 1.84 \\ 0.93 \\ 2.17 \end{array}$ | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19 | $\begin{array}{c} \text{DL} \\ (\mu g g^{-1}) \\ 0.003 \\ 0.082 \\ 0.001 \\ 0.034 \\ 0.002 \\ 0.002 \\ 0.018 \end{array}$
 |
 | $\begin{array}{c} \text{DIF} \\ (\mu g g^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \end{array}$ | 10 μm
DIF%
(%)
0.5
9.0
6.6
7.6
2.8
4.1
5.1 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mugg^{-1})
\\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \end{array}$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81 | Sensitivity
(cps/ µ g g ⁻¹)
59
3
59
6
70
55
11 | DL
(µgg ⁻¹)
0.004
0.180
0.005
0.078
0.003
0.005
0.048 |
| Sc
Ti
V
Cr
Mn
Co
Ni
Cu | RV
$(\mu g g^{-1})$
39.9
44
38.8
36.4
38.7
35.5
38.8
37.8

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113 | AV
(μgg ⁻¹)
38.1
42.6
42.7
36.7
36.6
35.5
43.8
39.9

 | DIF
$(\mu g g^{-1})$
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
 | 20 μm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53 | SD (1σ)
$(\mu_{g g})^{-1}$
1.24
1.72
1.67
2.18
1.84
0.93
2.17
1.32 | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
3.30
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48 | DL
(µgg ⁻¹)
0.003
0.082
0.001
0.034
0.002
0.002
0.018
0.005
 | AV
(μgg ⁻¹)
39.7
40.1
41.3
39.2
39.8
37.0
40.8
41.6
 | DIF
($\mu g g^{-1}$)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8 | 10 μm
DIF%
(%)
0.5
9.0
6.6
7.6
2.8
4.1
5.1
10.15 | SD $(1
\sigma)$
$(\mu_{gg})^{-1}$
2.35
4.38
2.10
1.45
4.60
1.22
2.37
1.69 | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05 | Sensitivity
(cps/µgg ⁻¹)
59
3
59
6
70
55
11
28 | DL
(µgg ⁻¹)
0.004
0.180
0.005
0.078
0.003
0.005
0.048
0.008 |
| Sc
Ti
V
Cr
Mn
Co
Ni
Cu
Zp | RV
(μ_{gg}^{-1})
39.9
44
38.8
36.4
38.7
35.5
38.8
37.8
39.1

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
23.3 | AV
$(\mu g g^{-1})$
38.1
42.6
42.7
36.7
36.6
35.5
43.8
39.9
37.2

 | DIF
$(\mu g g^{-1})$
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
 | 20 μm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4 9 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mu_{gg}^{-1}) \\ 1.24 \\ 1.72 \\ 1.67 \\ 2.18 \\ 1.84 \\ 0.93 \\ 2.17 \\ 1.32 \\ 2.02 \end{array}$ | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
3.30
5.4
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7 | DL
(µgg ⁻¹)
0.003
0.082
0.001
0.034
0.002
0.002
0.002
0.018
0.005
0.063
 | AV
(μgg ⁻¹)
39.7
40.1
41.3
39.2
39.8
37.0
40.8
41.6
32.7
 | DIF
$(\mu_{gg}g^{-1})$
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4 | 10 μm
DIF%
(%)
0.5
9.0
6.6
7.6
2.8
4.1
5.1
10.15
16.3 | SD (1σ)
$(\mu g
g^{-1})$
2.35
4.38
2.10
1.45
4.60
1.22
2.37
1.69
4.57 | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
13.95 | Sensitivity
(cps/µgg ⁻¹)
59
3
59
6
70
55
11
28
4 | $\begin{array}{c} \text{DL} \\ (\mu g g^{-1}) \\ 0.004 \\ 0.180 \\ 0.005 \\ 0.078 \\ 0.003 \\ 0.005 \\ 0.048 \\ 0.008 \\ 0.133 \end{array}$ |
| Sc
Ti
V
Cr
Mn
Co
Ni
Cu
Zn | RV
$(\mu g g^{-1})$
39.9
44
38.8
36.4
38.7
35.5
38.8
37.8
39.1
39.1

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3 | AV
$(\mu g g^{-1})$
38.1
42.6
42.7
36.7
36.6
35.5
43.8
39.9
37.2
20

 | DIF
$(\mu g g^{-1})$
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
0.0
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9 | SD (1σ)
$(\mu g g^{-1})$
1.24
1.72
1.67
2.18
1.84
0.93
2.17
1.32
2.02
2.02 | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
3.30
5.4
 | Sensitivity
(cps/ µg g ⁻¹)
114
6
101
11
132
99
19
48
7
20 | DL
(µgg ⁻¹)
0.003
0.082
0.001
0.034
0.002
0.018
0.002
0.018
0.005
0.063
 | AV
$(\mu g g^{-1})$
39.7
40.1
41.3
39.2
39.8
37.0
40.8
41.6
32.7
40.8
 | DIF
$(\mu g g^{-1})$
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4 1 | 10 μm
DIF%
(%)
0.5
9.0
6.6
7.6
2.8
4.1
5.1
10.15
16.3 | $\frac{\text{SD} (1 \sigma)}{(\mu g g^{-1})}$ 2.35 4.38 2.10 1.45
4.60 1.22 2.37 1.69 4.57 6.60 | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
13.95
5.40 | Sensitivity
(cps/ µ g g ⁻¹)
59
3
59
6
70
55
55
11
28
4
4 | $\begin{array}{c} \text{DL} \\ (\mu g g^{-1}) \\ 0.004 \\ 0.180 \\ 0.005 \\ 0.078 \\ 0.003 \\ 0.005 \\ 0.048 \\ 0.008 \\ 0.133 \\ 0.024 \end{array}$ |
| Sc
Ti
V
Cr
Mn
Co
Ni
Cu
Zn
Ga | RV
(μ_{gg}^{-1})
39.9
44
38.8
36.4
38.7
35.5
38.8
37.8
39.1
36.9

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0 | AV
$(\mu g g^{-1})$
38.1
42.6
42.7
36.7
36.6
35.5
43.8
39.9
37.2
38.9

 | DIF
$(\mu g g^{-1})$
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
2.0
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29 | SD (1σ)
$(\mu_{g g} e^{-1})$
1.24
1.72
1.67
2.18
1.84
0.93
2.17
1.32
2.02
1.50 | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
3.30
5.4
3.86
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
89 | $\begin{array}{c} DL \\ (\mu g g^{-1}) \\ 0.003 \\ 0.082 \\ 0.001 \\ 0.034 \\ 0.002 \\ 0.002 \\ 0.018 \\ 0.005 \\ 0.063 \\ 0.005 \\ 0.002 \end{array}$
 | AV
(μg g ⁻¹)
39.7
40.1
41.3
39.2
39.8
37.0
40.8
41.6
32.7
41.0
 | DIF
$(\mu g g^{-1})$
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1 | 10 μm DIF% (%) 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 11.0 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mugg^{-1}) \\ 2.35 \\
4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \end{array}$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
13.95
5.43 | Sensitivity
(cps/µgg ⁻¹)
59
3
59
6
70
55
11
28
4
4
8 | $\begin{array}{c} \text{DL} \\ (\mu g g^{-1}) \\ 0.004 \\ 0.180 \\ 0.005 \\ 0.078 \\ 0.003 \\ 0.005 \\ 0.048 \\ 0.008 \\ 0.133 \\ 0.004 \\ 0.005 \\ 0.004 \\ 0.005 \\ 0.004 \\ 0.005 \\ $ |
| Sc
Ti
V
Cr
Mn
Co
Ni
Cu
Zn
Ga
Ge | RV
(<u>µgg⁻¹)</u>
39.9
44
38.8
36.4
38.7
35.5
38.8
37.8
37.8
39.1
36.9
36.1

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247 | AV
$(\mu g g^{-1})$
38.1
42.6
42.7
36.6
35.5
43.8
39.9
37.2
38.9
41.0

 | DIF
$(\mu g g^{-1})$
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
2.0
4.9
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
13.6 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\text{g}\text{g}^{-1}) \\ 1.24 \\ 1.72 \\ 1.67 \\ 2.18 \\ 1.84 \\ 0.93 \\ 2.17 \\ 1.32 \\ 2.02 \\ 1.50 \\ 3.21 \end{array}$ | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
3.30
5.4
3.86
7.82
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
89
27 | DL
(µgg ⁻¹)
0.003
0.082
0.001
0.034
0.002
0.018
0.005
0.063
0.002
0.013
 | $\begin{array}{c} AV \\ (\mu g g^{-1}) \\ 39.7 \\ 40.1 \\ 41.3 \\ 39.2 \\ 39.8 \\ 37.0 \\ 40.8 \\ 41.6 \\ 32.7 \\ 41.0 \\ 39.9 \\ \end{array}$
 | $\begin{array}{c} \text{DIF} \\ (\mu g g^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \end{array}$ | 10 μm DIF% (%) 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 11.0 10.4 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mu_{\mathcal{B}
\mathcal{B}}^{-1}) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \end{array}$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
13.95
5.43
13.33 | $\begin{array}{c} \text{Sensitivity} \\ (cps/\mugg^{-1}) \\ 59 \\ 6 \\ 70 \\ 55 \\ 11 \\ 28 \\ 4 \\ 48 \\ 15 \end{array}$ | DL
(µgg ⁻¹)
0.004
0.180
0.005
0.078
0.003
0.005
0.048
0.008
0.133
0.004
0.033 |
| Sc
Ti
V
Cr
Mn
Co
Ni
Cu
Zn
Ga
Ge
As | RV
(µgg ⁻¹)
39.9
44
38.8
36.4
38.7
35.5
38.8
37.8
37.8
37.8
39.1
36.9
36.1
35.7

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7 | AV
$(\mu g g^{-1})$
38.1
42.6
42.7
36.7
36.6
35.5
43.8
39.9
37.2
38.9
41.0
34.3

 | DIF
$(\mu g g^{-1})$
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
2.0
4.9
1.4
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
13.6
4.03 | SD (1σ)
$(\mu_{g g} e^{-1})$
1.24
1.72
1.67
2.18
1.84
0.93
2.17
1.32
2.02
1.50
3.21
3.47 | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
3.30
5.4
3.86
7.82
10.1
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10 | $\begin{array}{c} \text{DL} \\ (\mu_{g g}^{-1}) \\ 0.003 \\ 0.082 \\ 0.001 \\ 0.034 \\ 0.002 \\ 0.018 \\ 0.005 \\ 0.063 \\ 0.005 \\ 0.063 \\ 0.002 \\ 0.013 \\ 0.035 \end{array}$
 | AV (μgg ⁻¹) 39.7 40.1 41.3 39.2 39.8 37.0 40.8 41.6 32.7 41.0 39.9 37.2
 | DIF
$(\mu g g^{-1})$
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5 | 10 μm DIF% (%) 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 11.0 10.4 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\mathrm{gg}^{-1}) \\ 2.35 \\
4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \end{array}$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
13.95
5.43
13.33
12.55 | $\begin{array}{c} \text{Sensitivity} \\ (cps/\mu g g^{-1}) \\ 59 \\ 6 \\ 70 \\ 55 \\ 11 \\ 28 \\ 4 \\ 48 \\ 15 \\ 5 \end{array}$ | DL
(µgg ⁻¹)
0.004
0.180
0.005
0.078
0.003
0.005
0.048
0.008
0.133
0.004
0.033
0.014 |
| Sc
Ti
V
Cr
Mn
Co
Ni
Cu
Zn
Ga
Ge
As
Rh | RV
$(\mu_{g}g^{-1})$
39.9
44
38.8
36.4
35.5
38.8
37.8
39.1
36.9
36.1
35.7
31.4

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76 | AV
(µgg ⁻¹)
38.1
42.6
42.7
36.6
35.5
43.8
39.9
37.2
38.9
41.0
34.3
32.8

 | DIF
$(\mu g g^{-1})$
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
2.0
4.9
1.4
1.4
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
13.6
4.03
4.37 | SD (1σ)
$(\mu_{g g}^{-1})$
1.24
1.72
1.67
2.18
1.84
0.93
2.17
1.32
2.02
1.50
3.21
3.47
0.58 | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
3.30
5.4
3.80
7.82
10.1
1.76
 | $\begin{array}{c} \text{Sensitivity} \\ (cps/\mu g g^{-1}) \\ 114 \\ 6 \\ 101 \\ 111 \\ 132 \\ 99 \\ 19 \\ 48 \\ 7 \\ 89 \\ 27 \\ 10 \\ 114 \end{array}$ | $\begin{array}{c} \begin{array}{c} \text{DL} \\ (\mu \ g \ g^{-1}) \\ 0.003 \\ 0.082 \\ 0.001 \\ 0.034 \\ 0.002 \\ 0.018 \\ 0.005 \\ 0.063 \\ 0.002 \\ 0.013 \\ 0.035 \\ 0.001 \end{array}$
 | AV (μgg ⁻¹) 39.7 40.1 41.3 39.2 39.8 37.0 40.8 41.6 32.7 41.0 39.9 37.2 36.8
 | DIF
$(\mu g g^{-1})$
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4 | 10 μm
DIF%
(%)
0.5
9.0
6.6
7.6
2.8
4.1
5.1
10.15
16.3
11.0
10.4
4.3
17.25 | $\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{R,R}^{-1}) \\
2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.72 \end{array}$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
13.95
5.43
13.33
12.55
4.67 | Sensitivity
(cps/ μ g g ⁻¹)
59
6
70
55
11
28
4
4
8
15
5
9 | DL
(µgg ⁻¹)
0.004
0.180
0.005
0.078
0.003
0.005
0.048
0.133
0.004
0.033
0.114 |
| Sc
TiV
Cr
Mn
Co
Ni
U
Ga
Ge
Sc
Sc
Sc
Sc
Sc
Sc
Sc
Sc
Sc
Sc
Sc
Sc
Sc | RV
(<u>µgg⁻¹)</u>
39.9
44
38.8
36.4
38.7
35.5
38.8
37.8
39.1
36.9
36.1
35.7
31.4
78.4

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3 | AV
(μgg ⁻¹)
38.1
42.6
42.7
36.7
36.7
36.7
36.7
36.7
36.7
36.7
38.9
43.8
39.9
37.2
38.9
41.0
34.3
32.8
76.9

 | DIF
(µgg ⁻¹)
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
2.0
4.9
1.4
1.4
1.5
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
13.6
4.03
4.03
4.37 | SD (1 σ)
(μ_{gg} s ⁻¹)
1.24
1.72
1.67
2.18
1.84
0.93
2.17
1.32
2.02
1.50
3.21
3.47
0.58 | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
3.30
5.4
3.86
7.82
10.1
1.76
2.45
 | Sensitivity
($(cps/\mu g g^{-1})$)
114
6
101
11
132
99
19
48
7
89
27
10
114
156 | $\begin{array}{c} \text{DL} \\ (\mu g g^{-1}) \\ 0.003 \\ 0.082 \\ 0.001 \\ 0.034 \\ 0.002 \\ 0.018 \\ 0.005 \\ 0.063 \\ 0.005 \\ 0.063 \\ 0.002 \\ 0.013 \\ 0.035 \\ 0.001 \\ 0.002 \end{array}$
 | AV
(μg g ⁻¹)
39.7
40.1
41.3
39.2
39.8
37.0
40.8
41.6
32.7
41.0
39.9
37.2
36.8
76 9
 | DIF
(µgg ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5 | 10 μm DIF% (%) 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 11.0 10.4 4.3 17.25 19 | SD $(1
\sigma)$
(μ_{gg}^{-1})
2.35
4.38
2.10
1.45
4.60
1.22
2.37
1.69
4.57
2.23
5.32
4.67
1.72
4.09 | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
13.95
5.43
13.33
12.55
4.67
5.32 | $\begin{array}{c} \text{Sensitivity} \\ (cps/\mu g g^{-1}) \\ 59 \\ 6 \\ 70 \\ 55 \\ 11 \\ 28 \\ 4 \\ 48 \\ 15 \\ 5 \\ 59 \\ 84 \end{array}$ | DL
(µgg ⁻¹)
0.004
0.180
0.005
0.078
0.005
0.048
0.008
0.1048
0.008
0.133
0.004
0.033
0.004 |
| Sc
TV
Cr
MCo
Ni
U
Sc
Sc
Sc
Sc
Sc
Sc
Sc
Sc
Sc
Sc
Sc
Sc
Sc | RV
(<u>µg g⁻¹)</u>
39.9
44
38.8
36.4
35.5
38.8
37.8
39.1
36.9
36.1
35.7
31.4
78.4
78.4
28.2

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7 | AV (μεε ⁻¹) 38.1 42.6 42.7 36.6 35.5 43.8 39.9 41.0 34.3 32.8 76.9 41.3 32.8 76.9

 | DIF
(µgg ⁻¹)
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
2.0
4.9
1.4
1.4
1.4
1.5
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
13.6
4.03
4.37
1.9
2.7 | $\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{B E}^{-1}) \\ 1.24 \\ 1.72 \\ 1.67 \\ 2.18 \\ 1.84 \\ 0.93 \\ 2.17 \\ 1.32 \\ 2.02 \\ 1.50 \\ 3.21 \\ 3.47 \\ 0.58 \\ 1.88 \\ 1.12 \end{array}$ | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
3.30
5.4
3.86
7.82
10.1
1.76
2.45
2.82
 | $\begin{array}{c} \text{Sensitivity} \\ (cps/\mu g g^{-1}) \\ 114 \\ 6 \\ 101 \\ 111 \\ 132 \\ 99 \\ 19 \\ 48 \\ 7 \\ 89 \\ 27 \\ 10 \\ 114 \\ 156 \\ 100 \end{array}$ | $\begin{array}{c} \begin{array}{c} \text{DL} \\ (\mu \ g \ g^{-1}) \\ 0.003 \\ 0.082 \\ 0.001 \\ 0.034 \\ 0.002 \\ 0.018 \\ 0.005 \\ 0.063 \\ 0.002 \\ 0.013 \\ 0.035 \\ 0.001 \\ 0.002 \\ 0.001 \\ \end{array}$
 | AV
(μgg ⁻¹)
39.7
40.1
41.3
39.2
39.8
37.0
40.8
41.6
32.7
41.0
39.9
37.2
36.8
76.9
27.4
 | DIF
(µgg ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5
5.4 | 10 μm DIF% (%) 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 11.0 10.4 4.3 17.25 1.9 2.2 | $\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu g g^{-1}) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60
\\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.72 \\ 4.09 \\ 1.72 \\ 4.09 \\ 1.72 \\ 4.09 \\ 1.72 \\ 4.09 \\ 1.72 \\ 4.09 \\ 1.72 \\ 1$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
13.95
5.43
13.95
5.43
13.33
12.55
4.67
5.32 | Sensitivity
(ops/ µgg ⁻¹)
59
6
70
55
11
28
4
4
4
4
8
15
5
59
84 | DL
(µgg ⁻¹)
0.004
0.180
0.005
0.078
0.003
0.005
0.048
0.008
0.133
0.004
0.033
0.0114
0.003
0.114 |
| Sc
Ti
V
Cr
Mn
Co
Ni
U
Zn
Ge
As
Rb
Sr
Y | RV
$(\mu_{g}g^{-1})$
39.9
44
38.8
36.4
38.7
35.5
38.8
37.8
39.1
36.9
36.1
35.7
31.4
78.4
38.3
37.8

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7 | AV
(µgg ⁻¹)
38.1
42.6
42.7
36.7
35.5
43.8
39.9
37.2
38.9
41.0
34.3
32.8
76.9
39.4

 | DIF
(µgg ⁻¹)
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
2.0
4.9
1.4
1.5
1.1
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
13.6
4.03
4.37
1.9
2.7 | $SD (1 \sigma) (\mu_{E g}) (1 \sigma) (1 $ | RSD
(%)
3.25
4.0
5.95
5.04
2.62
4.96
3.30
5.4
3.30
5.4
3.30
5.4
10.1
1.76
2.45
2.83 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189 | $\begin{array}{c} \begin{array}{c} DL \\ (\mu \ g \ g^{-1}) \\ 0.003 \\ 0.082 \\ 0.001 \\ 0.034 \\ 0.002 \\ 0.018 \\ 0.005 \\ 0.063 \\ 0.005 \\ 0.001 \\ 0.035 \\ 0.001 \\ 0.002 \\ 0.001
\\ 0.001 \\ 0.$
 | AV (μgg ⁻¹) 39.7 39.7 40.1 41.3 39.2 39.8 37.0 40.8 41.6 32.7 41.0 39.9 37.2 36.8 76.9 37.4 37.4
 | DIF
(<u>µgg⁻¹</u>)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5
0.9 | 10 μm DIF% (%) 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 11.0 10.4 4.3 17.25 1.9 2.3 | $\begin{array}{c} \text{SD} \ (1\sigma) \\ (\mu_{gg}^{-1}) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.72 \\ 4.09 \\ 1.05 \\ 1.55 \end{array}$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
13.95
5.43
13.33
12.55
4.67
5.32
2.81
 | Sensitivity
(cps/ µ g g ⁻¹)
59
6
70
55
11
28
4
48
15
5
59
84
106 | DL
(µgg ⁻¹)
0.004
0.005
0.078
0.005
0.048
0.005
0.048
0.003
0.004
0.033
0.104
0.003
0.004
0.003 |
| Sc
Ti
V
Cr
Mn
Co
Ni
Cu
Zn
Ga
Ge
Sr
Y
Zr | RV
(<u>µg g⁻¹)</u>
39.9
44
38.8
36.4
38.7
35.5
38.8
37.8
36.9
36.1
35.7
31.4
78.4
38.3
37.9

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
40
247
14.7
76
1.3
2.7
4.0 | $\begin{array}{c} AV \\ (\mu_{gg}^{-1}) \\ 38.1 \\ 42.6 \\ 42.7 \\ 36.6 \\ 35.5 \\ 43.8 \\ 39.9 \\ 37.2 \\ 38.9 \\ 41.0 \\ 34.3 \\ 32.8 \\ 76.9 \\ 39.4 \\ 40.3 \\ \end{array}$

 | $\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \end{array}$
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.29
13.6
4.03
4.37
1.9
2.7
6.3 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu_{Bg}^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.8\\ 1.12\\ 1.12\end{array}$ | RSD
(%)
3.25
4.0
5.95
5.04
2.62
4.96
3.30
5.4
3.86
7.82
10.1
1.76
2.45
2.83
2.78
 | Sensitivity
(cps/ <u>µ g g ¹)</u>
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97 | DL (μεε ⁻¹) 0.003 0.082 0.0034 0.002 0.0034 0.002 0.003 0.003 0.002 0.003 0.003 0.004 0.005 0.005 0.005 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001
 | AV (µgg ⁻¹) 39.7 40.1 41.3 39.2 39.8 37.0 40.8 41.6 32.7 41.0 39.9 37.2 36.8 76.9 37.4 38.1
 | $\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 5.4 \\ 1.5 \\ 5.4 \\ 1.5 \\ 0.9 \\ 0.2 \end{array}$ | 10 μm DIF% (%) 0.5 9.0 6.6 7.6 2.8 4.1 5.15 16.3 11.0 10.4 4.3 17.25 1.9 2.3 0.5 | $\begin{array}{c} {\rm
SD}(1\sigma)\\(\mugg^{-1})\\2.35\\4.38\\2.10\\1.45\\4.60\\1.22\\2.37\\1.69\\4.57\\2.23\\5.32\\4.67\\1.72\\4.09\\1.05\\1.94\end{array}$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
13.95
5.43
13.33
12.55
4.67
5.32
2.81
5.09 | Sensitivity
(cps/ µ g g ⁻¹)
59
6
70
55
11
28
4
4
4
4
8
15
5
59
84
106
55 | $\begin{array}{c} DL \\ (\mugg^{-1}) \\ 0.004 \\ 0.180 \\ 0.005 \\ 0.003 \\ 0.005 \\ 0.008 \\ 0.133 \\ 0.004 \\ 0.033 \\ 0.004 \\ 0.033 \\ 0.114 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.006 \\ \end{array}$ |
| Sc
TiV
Cr
Mn
Co
NCu
Zn
Ge
Sr
Y
Zr
Nb | $\begin{array}{c} RV \\ (\mu_{g}g^{-1}) \\ 39.9 \\ 44 \\ 38.8 \\ 36.4 \\ 38.7 \\ 35.5 \\ 38.8 \\ 39.1 \\ 36.1 \\ 35.7 \\ 31.4 \\ 78.4 \\ 38.3 \\ 37.9 \\ 38.9 \\ \end{array}$

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0 | AV
(µgg ⁻¹)
38.1
42.6
42.7
36.6
35.5
43.8
39.9
37.2
38.9
41.0
34.3
32.8
76.9
39.4
40.3
88.9

 | $\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \end{array}$
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
13.6
4.03
4.37
1.9
2.7
6.3
0.0 | $\begin{array}{c} \text{SD} \ (1 \ \sigma) \\ (\mu \ g \ g^{-1}) \\ 1.24 \\ 1.72 \\ 1.72 \\ 1.67 \\ 2.18 \\ 1.84 \\ 0.93 \\ 2.17 \\ 1.32 \\ 2.02 \\ 1.50 \\ 3.21 \\ 3.47 \\ 0.58 \\ 1.88 \\ 1.12 \\ 1.12 \\ 1.80 \end{array}$ | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
3.30
5.4
3.86
7.82
10.1
1.76
2.45
2.83
2.78
4.62
 | Sensitivity
(cps/ <u>µg g⁻¹)</u>
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173 | <u> DL</u> (μgg ⁻¹) 0.003 0.082 0.001 0.034 0.002 0.018 0.063 0.063 0.063 0.002 0.013 0.035 0.002 0.001 0.004 0.001
 | $\begin{array}{c} AV \\ (\mu \ g \ g^{-1}) \\ 39.7 \\ 40.1 \\ 41.3 \\ 9.2 \\ 39.8 \\ 37.0 \\ 40.8 \\ 41.6 \\ 32.7 \\ 41.0 \\ 39.2 \\ 37.4 \\ 38.1 \\ 37.2 \\ 36.8 \\ 37.4 \\ 38.1 \\ 41.1 \\ 41.1 \end{array}$
 | DIF
(µgg ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
6.4
4.1
3.8
1.5
5.4
1.5
5.4
1.5
0.9
0.2
2.2 | 10 μm μm DIF% (%) 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 11.0 10.45 1.9 2.3 0.5 5.7 5.7 | $\begin{array}{c} {\rm
SD}(1\sigma)\\(\mu_{Eg}{}^{-1})\\2.35\\4.38\\2.10\\1.45\\4.60\\1.22\\2.37\\1.69\\4.57\\2.23\\5.32\\4.67\\1.72\\4.67\\1.05\\1.94\\1.05\\1.94\\1.08\end{array}$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
5.43
13.95
5.43
13.33
12.55
4.67
5.32
2.81
5.09
2.63 | $\begin{array}{c} \text{Sensitivity} \\ (\text{cps} / \mu \text{g g}^{-1}) \\ 59 \\ 6 \\ 70 \\ 55 \\ 11 \\ 28 \\ 4 \\ 48 \\ 15 \\ 5 \\ 59 \\ 84 \\ 106 \\ 55 \\ 91 \\ \end{array}$ | $\begin{array}{c} DL \\ (\mugg^{-1}) \\ 0.004 \\ 0.005 \\ 0.078 \\ 0.005 \\ 0.005 \\ 0.048 \\ 0.003 \\ 0.133 \\ 0.004 \\ 0.033 \\ 0.114 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.002 \\ \end{array}$ |
| Sc
TiVCr
MCo
NiCu
Zn
Ge
Sr
Y
Zr
Bo | RV
$(\mu_{E}e^{-1})$
$(\mu_{E}e^{-1})$
3g.9
44
38.8
36.4
38.7
36.4
38.8
37.8
37.8
39.1
36.9
36.9
36.1
35.7
36.9
36.1
35.7
36.9
36.1
35.7
35.7
36.9
36.1
35.7
35.7
36.9
36.1
35.7
35.7
36.9
36.1
35.7
35.7
36.9
36.1
35.7
35.7
35.7
36.9
35.7
35.7
35.7
36.9
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
35.7
37.4

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
40
247
14.7
76
1.3
2.7
4.0
0.0
0.0 | AV (μgg ⁻¹) 38.1 42.6 42.7 36.6 35.5 43.8 39.9 37.2 38.9 41.0 34.3 32.8 76.9 39.4 40.3 38.9 38.4

 | DIF
(µgg ⁻¹)
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
2.0
4.9
1.4
1.5
1.1
2.4
0.0
1.0
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
13.6
4.03
4.37
1.9
2.7
6.3
0.0
2.7 | $\begin{array}{c} \text{SD} \ (1 \ \sigma) \\ (\mu \ g \ g^{-1}) \\ 1.24 \\ 1.72 \\ 1.67 \\ 2.18 \\ 1.84 \\ 0.93 \\ 2.17 \\ 1.32 \\ 2.02 \\ 1.50 \\ 3.21 \\ 1.50 \\ 3.21 \\ 1.50 \\ 3.21 \\ 1.50 \\ 3.21 \\ 1.12 \\ 1.12 \\ 1.12 \\ 1.84 \\ 1.12 \\ 1.12 \\ 1.84 \\ 1.12 \\ 1.12 \\ 1.84 \\ 1.12 \\ 1.12 \\ 1.84 \\ 1.12 \\ 1.12 \\ 1.84 \\ 1.12 \\ 1.12 \\ 1.84 \\ 1.12 \\ 1.12 \\ 1.84 \\ 1.12 \\ 1.12 \\ 1.84 \\ 1.12 \\ 1.12 \\ 1.84 \\ 1.12 \\ 1.12 \\ 1.84 \\ 1.12 \\ 1.12 \\ 1.84 \\ 1.12 \\ $ | RSD
(%)
3.25
4.0
5.95
5.04
2.62
4.96
3.30
5.4
3.86
7.82
10.1
1.76
2.45
2.83
2.78
4.62
3.83
 | Sensitivity
(cps/ µg g ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30 | DL (µgg') 0.003 0.082 0.001 0.334 0.002 0.002 0.002 0.018 0.002 0.013 0.035 0.001 0.002 0.013 0.001 0.002 0.001 0.004 0.006
 | $\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.8 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 36,8 \\ 76,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 43,6 \\ \end{array}$
 | DIF
$(\mu g g^{-1})$
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5
0.9
0.2
2.2
6.2 | 10 μm μm DIF% (%) 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 11.0 10.4 4.3 17.25 1.9 2.3 0.5 5.7 16.5 | $\begin{array}{c} \text{SD} \left(1\sigma\right)\\
\left(\mu_{gg}^{-1}\right)\\ 2.35\\ 4.38\\ 2.10\\ 1.45\\ 4.60\\ 1.22\\ 2.37\\ 1.69\\ 4.57\\ 2.23\\ 5.32\\ 4.67\\ 1.72\\ 4.09\\ 1.05\\ 1.94\\ 1.05\\ 1.$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
13.95
5.43
13.95
5.43
13.35
12.55
4.67
5.32
2.81
5.09
2.63
6.26 | Sensitivity
(cps/ µ g g ⁻¹)
59
6
70
55
11
28
4
4
4
4
8
4
15
5
59
84
106
55
91
15 | $\begin{array}{c} DL \\ (\mugg^{-1}) \\ 0.004 \\ 0.005 \\ 0.078 \\ 0.003 \\ 0.005 \\ 0.008 \\ 0.008 \\ 0.133 \\ 0.004 \\ 0.033 \\ 0.114 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.002 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.002 \\ 0.004 \\ 0.002 \\ 0.014 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.001 \\ 0.002 \\ 0.0014 \\ 0.001 \\$ |
| Sc Ti V Crn Co Ni U Z G Ge As Br Y Zr Bb O d | RV
($\mu_g g^{-1}$)
39.9
44
38.8
36.4
38.7
35.7
38.8
37.8
39.1
36.9
36.1
35.7
31.4
78.4
38.9
37.4
38.9
37.9
38.9
37.4
28.1

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
0.0
2.5 | AV
(µgg ⁻¹)
38.1
42.6
42.7
36.6
35.5
43.8
39.9
37.2
8.9
41.0
34.3
8.9
41.0
34.3
32.8
76.9
39.4
40.3
38.9
38.9
40.3
38.9
27.1

 | $\begin{array}{c} \text{DIF} \\ (\mu g g^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \\ 1.0 \\ 1.0 \end{array}$
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
13.6
4.03
4.37
1.9
2.7
6.3
0.0
2.7
3.6 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu_{EE}^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.12\\ 1.88\\ 1.12\\ 1.80\\ 1.47\\ 1.80\\ 1.87\\ 1.80\\ 1.88\\ 1.88\\ 1.88\\ 1.80\\ 1.88\\ 1.80\\ 1.88\\ 1.80\\ 1.88\\ 1.80\\ 1.88\\ 1.80\\ 1.87\\ 1.80\\ 1.87\\ 1.80\\ 1.87\\ 1.80\\ 1.87\\ 1.80\\ 1.87\\ 1.80\\ 1.87\\ 1.87\\ 1.80\\ 1.87\\ 1.87\\ 1.80\\ 1.87\\$ | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
3.30
5.4
3.86
7.82
10.1
1.76
2.45
2.83
2.78
4.62
3.83
6.7
 | Sensitivity
(cps/ <u>µg</u> g ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7 | <u> (μgg⁻¹)</u> 0.003 0.082 0.004 0.002 0.004 0.002 0.018 0.005 0.005 0.002 0.018 0.005 0.002 0.013 0.035 0.001 0.002 0.001 0.004
 | $\begin{array}{c} AV \\ (\mu g g^{-1}) \\ 39.7 \\ 40.1 \\ 41.3 \\ 39.2 \\ 39.8 \\ 37.0 \\ 40.8 \\ 41.6 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 37.2 \\ 36.8 \\ 37.4 \\ 38.1 \\ 38.4 \\ 38.4 \\ 38.4 \\ 38.8 \\ \end{array}$
 | DIF
$(\mu g g^{-1})$ 0.2
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7 | 10 μm μm DIF% (%) 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 11.0 10.4 4.3 4.7.25 1.9 2.3 0.5 5.7 16.5 2.4 4 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mu_{\rm gg}
{\rm g}^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.72 \\ 4.67 \\ 1.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.08 \\ 1.08 \\ 2.73 \\ 1.08$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
4.05
13.95
5.43
12.55
4.67
5.32
2.81
5.09
2.63
6.26
2.14 | Sensitivity
$(cps/ \mu g g^{-1})$
59
6
70
55
11
28
4
48
15
5
59
84
106
55
91
15
3 | $\begin{array}{c} DL \\ (\mu g g^{-1}) \\ 0.004 \\ 0.180 \\ 0.005 \\ 0.078 \\ 0.003 \\ 0.005 \\ 0.048 \\ 0.008 \\ 0.133 \\ 0.114 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.002 \\ 0.0147 \\ 0.147 \end{array}$ |
| Sc
Ti
V
Cr
Mn
Co
Ni
Cu
Zn
Ge
Sr
Y
Zr
Nb
Mo
Cs | RV
(<u>µ g g⁻¹)</u>
3 g-9
44
38.8
36.4
38.7
35.5
38.8
37.8
39.1
35.7
31.4
78.4
38.3
37.9
38.9
37.4
28.6

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
40
247
14.7
76
1.3
2.7
4.0
0.0
0.0
2.5
33.2 | AV
(μgg ⁻¹)
38.1
42.6
42.7
36.7
36.6
35.5
43.8
39.9
41.0
34.3
32.8
76.9
41.0
34.3
32.8
76.9
41.0
34.3
32.8
76.9
41.0
34.3
32.8
76.9
39.4
40.3
38.4
27.1
11

 | $\begin{array}{c} \text{DIF} \\ (\mu_{\text{gg}}^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 2.5 \end{array}$
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
13.6
4.03
4.37
1.9
2.7
6.3
0.0
2.7
3.6
6 50 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu_{gg}^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 1.50\\ 3.47\\ 0.58\\ 1.88\\ 1.88\\ 1.12\\ 1.12\\ 1.12\\ 1.80\\ 1.47\\ 1.82\\ 1.97\\ 1.87\\ 1.97\\ $ | RSD
(%)
3.25
4.0
5.95
5.04
2.62
4.96
3.30
5.4
3.80
5.4
3.80
7.82
10.1
1.76
2.45
2.83
2.78
4.62
3.83
6.7
 | Sensitivity
(cps/ µg g ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55 | DL (µgg') 0.003 0.082 0.001 0.334 0.002 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.001 0.001 0.002 0.001 0.002 0.001 0.002
 | $\begin{array}{c} AV \\ (\mu \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.8 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,0 \\ 40.8 \\ 76,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 43,6 \\ 28,8 \\ 76,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 43,6 \\ 28,8 \\ 76,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 43,6 \\ 28,8 \\ 76,9 \\ 37,4 \\ 38,1 \\ 43,6 \\ 38,1 \\ 38,1 \\ 38,1 \\ 38,1 \\ 38,1 \\ 38,1 \\ 38,1 \\ 38,1 \\ 38,1 \\ 38,1 \\ 38,2 \\ 38,1 \\ 38,1 \\ 38,1 \\ 38,1 \\ 38,2 \\ 38,1 \\ 38,1 \\ 38,1 \\ 38,1 \\ 38,2 \\ 38,1 \\$
 | $\begin{array}{c} \text{DIF} \\ (\mu_{B}g^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 5.4 \\ 1.5 \\ 5.4 \\ 1.5 \\ 0.9 \\ 0.2 \\ 2.2 \\ 6.2 \\ 0.7 \\ 4.9 \end{array}$ | 10 μm μm DIF% (%) 0.5 9.0 0.6 7.6 2.8 4.1 5.1 10.15 16.3 11.0 10.4 4.3 17.25 1.9 2.3 0.5 5.7 16.5 2.4 1.2 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mugg^{-1}) \\ 2.35 \\ 4.38 \\
2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.72 \\ 4.09 \\ 1.05 \\ 1.94 \\ 1.05 \\ 1$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
13.95
5.43
13.33
13.33
12.55
4.67
5.32
2.81
12.55
4.67
5.32
2.63
6.26
21.4 | Sensitivity
(cps/ µ g g ⁻¹)
59
6
70
55
11
28
4
4
55
59
84
15
55
84
106
55
91
15
3
2° | DL
(μgg ⁻¹)
0.004
0.005
0.078
0.003
0.048
0.008
0.048
0.004
0.033
0.004
0.033
0.004
0.003
0.004
0.003
0.004
0.003
0.006
0.002
0.004
0.002 |
| Sc
TiV
Cr
Mn
Co
Niu
Ga
Ga
Sr
Y
Zr
Mo
Cd
Sn | RV
(μ_{gg}^{-1})
(μ_{gg}^{-1})
(μ_{gg}^{-1})
(μ_{gg}^{-1})
(μ_{gg}^{-1})
(μ_{gg}^{-1})
(μ_{gg}^{-1})
(μ_{gg}^{-1})
(μ_{gg}^{-1})
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(μ_{gg}^{-1})
(μ_{gg}^{-1})
(μ_{gg}^{-1})
(μ_{gg}^{-1})
(μ_{gg}^{-1})
(μ_{gg}^{-1})

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
0.0
2.5
33.3
3.0
0.0 | AV
(μgg ⁻¹)
38.1
42.6
35.5
43.8
35.5
43.8
39.9
41.0
34.3
32.8
76.9
39.4
40.3
38.9
38.4
40.3
38.9
38.4
40.3
38.9
38.4
40.7
38.9
38.4
40.7
38.1
40.7
38.1
40.7
38.1
40.7
38.1
40.7
34.1
40.7
40.7
40.7
40.7
40.7
40.7
40.7
40.7

 | DIF
(µgg ⁻¹)
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
2.0
4.9
1.4
1.4
1.5
1.1
2.4
0.0
1.0
2.5
 | 20 µm
DIF%
(%)
4.6
0.77
5.6
0.11
12.77
5.56
0.11
12.77
5.29
13.6
4.03
4.37
1.9
2.7
6.3
0.0
2.7
3.6
6.55 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu_{E}g^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.12\\ 1.88\\ 1.12\\ 1.80\\ 1.47\\ 1.80\\ 1.47\\ 1.82\\ 1.82\\ 1.82\\ 1.82\\ 1.82\\ 1.87\\ $ | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
3.30
5.4
3.86
7.82
10.1
1.76
2.83
2.78
4.62
3.83
6.7
4.56
 | Sensitivity
(cps/ <u>µg</u> g ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
1566
189
97
173
30
7
55 | DL (μgg ⁻¹) 0.003 0.082 0.001 0.034 0.002 0.018 0.002 0.013 0.035 0.002 0.013 0.035 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.004 0.0045 0.003
 | $\begin{array}{c} AV \\ (\mugg^{-1}) \\ 39.7 \\ 40.1 \\ 41.3 \\ 39.2 \\ 39.8 \\ 37.0 \\ 40.8 \\ 41.6 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 37.2 \\ 36.8 \\ 37.4 \\ 38.1 \\ 41.1 \\ 43.6 \\ 28.6 \\ 43.5 \\ 5.7 \\$
 | DIF
(μ_{gg}^{-1}) 0.2
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
4.1
3.8
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9 | 10 μ m DIF% (%) 0.5 9.0 6.6 7.6 7.15 16.3 10.15 16.3 11.0 10.4 10.25 1.9 2.3 0.5 5.7 16.5 2.4 12.6 | $\begin{array}{c} {\rm
SD}(1\sigma)\\(\mu_{Eg}{}^{-1})\\2.35\\4.38\\2.37\\1.45\\4.60\\1.22\\2.37\\1.69\\4.57\\2.23\\5.32\\4.67\\1.72\\2.33\\5.32\\4.67\\1.09\\1.05\\1.94\\1.08\\2.73\\6.17\\1.44\\1.64\\1.64\\1.64\\1.64\\1.64\\1.64\\1.64$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
13.95
5.43
13.33
12.55
4.67
5.32
2.81
5.09
2.63
6.26
21.4
3.31 | $\begin{array}{c} \text{Sensitivity} \\ (\text{cps} / \mu \text{g g}^{-1}) \\ 59 \\ 6 \\ 70 \\ 55 \\ 11 \\ 28 \\ 4 \\ 15 \\ 5 \\ 59 \\ 84 \\ 106 \\ 55 \\ 91 \\ 15 \\ 3 \\ 28 \\ 28 \\ \end{array}$ | $\begin{array}{c} DL \\ (\mugg^{-1}) \\ 0.004 \\ 0.180 \\ 0.007 \\ 0.003 \\ 0.005 \\ 0.004 \\ 0.008 \\ 0.004 \\ 0.003 \\ 0.0003 \\ 0.004 \\ 0.003 \\ 0.0003 \\ 0.004 \\ 0.003 \\ 0.0003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.004 \\ 0.003 \\ 0.001 \\ 0.001 \\ 0.003 \\ 0.001 \\ 0.001 \\ 0.003 \\ 0.001$ |
| Sc
TiV
Cr
Mn
Co
I
U
Zn
Ga
e
As
Rb
Sr
Y
Zr
Nb
Od
Cs
Sb | $\begin{array}{c} RV \\ (\mu_{B,g}^{-1}) \\ 39.9 \\ 44 \\ 38.8 \\ 36.4 \\ 35.5 \\ 38.8 \\ 35.5 \\ 38.8 \\ 35.7 \\ 39.1 \\ 35.7 \\ 39.1 \\ 36.1 \\ 35.7 \\ 36.1 \\ 35.7 \\ 31.4 \\ 78.4 \\ 38.3 \\ 37.9 \\ 38.9 \\ 37.4 \\ 28.1 \\ 38.6 \\ 34.7 \\ \end{array}$

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
40
247
14.7
76
1.3
2.7
4.0
0.0
0.0
2.5
33.3
8.0 | AV
(μgg ⁻¹)
38.1
42.6
42.7
36.7
36.6
35.5
43.8
39.9
41.0
34.3
32.8
9
41.0
34.3
32.8
9
41.0
34.3
32.8
9
41.0
34.3
32.8
9
41.0
34.3
32.8
9
41.0
34.1
40.6
9
38.4
40.5
38.1
40.6
1
38.1
40.6
1
38.1
40.6
1
35.5
40.6
1
35.5
40.6
1
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35.5
35.5
40.5
35.5
35.5
35.5
35.5
35.5
35.5
35.5
3

 | $\begin{array}{c} \text{DIF} \\ (\mu_{\text{E}\text{g}}^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 2.5 \\ 4.4 \end{array}$
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.29
13.6
4.03
4.37
1.9
2.7
6.3
0.0
2.7
3.6
6.50
12.7 | $\begin{array}{c} \text{SD} \ (1\sigma) \\ (\mu \ e \ e^{-1}) \\ 1.24 \\ 1.72 \\ 1.67 \\ 2.18 \\ 1.84 \\ 0.93 \\ 2.17 \\ 1.32 \\ 2.02 \\ 1.50 \\ 3.21 \\ 3.47 \\ 1.32 \\ 1.12 \\ 1.88 \\ 1.12 \\ 1.81 \\ 1.87 \\ 2.66 \end{array}$ | RSD
(%)
3.25
4.0
5.95
5.04
2.62
4.96
3.30
5.4
3.80
5.4
3.80
5.4
10.1
1.76
2.45
2.83
2.78
4.62
3.83
6.7
4.56
6.81
 | Sensitivity
(cps/ µg g ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
1889
97
173
30
7
55
60 | DL (µ g g '') 0.003 0.082 0.001 0.334 0.002 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.001 0.004 0.004 0.003 0.004
 | $\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,8 \\ 39,8 \\ 37,0 \\ 40.8 \\ 37,0 \\ 40.8 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 36,8 \\ 76,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 43,6 \\ 28,8 \\ 43,5 \\ 39,1 \\ \end{array}$
 | DIF
(µgg ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
6.4
4.1
3.5
5.4
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9
4.4 | 10 μm μm DIF% (%) 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 11.0 10.4 4.3 17.25 5.7 16.5 5.7 16.5 2.4 12.6 12.6 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1}
\right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.72 \\ 4.09 \\ 1.05 \\ 1.94 \\ 1.05 \\$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
5.43
13.95
5.43
13.95
5.43
13.95
5.43
13.95
5.43
13.52
2.81
4.67
5.32
2.83
6.26
21.4
5.91 | Sensitivity
(cps/ µ g g ⁻¹)
59
6
70
55
11
28
4
4
55
59
84
15
55
84
106
55
91
15
3
28
34 | DL
(μgg ⁻¹)
0.004
0.005
0.078
0.005
0.048
0.008
0.048
0.033
0.004
0.033
0.004
0.033
0.004
0.033
0.004
0.003
0.004
0.003
0.004
0.003
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0.003
0.004
0.003
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0.003
0.004
0.004
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0.00 |
| Sc
TiV
Cr
Mn
Co
NiU
Zn
Ga
Ge
Sr
Y
Zr
Mo
Cd
Sn
B
Sc
S | RV
$(\mu_{g}g^{-1})$
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$(\mu_{g}g^{-1})$
$(\mu_{g}g^{-1})$
$(\mu_{g}g^{-1})$
$(\mu_{g}g^{-1})$

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
0.0
2.5
33.3
8.0
203 | AV (μgg ⁻¹) 38.1 42.6 42.7 36.7 35.5 43.8 39.9 37.2 38.9 34.3 32.8 76.9 39.4.0 38.9 39.1 41.1 39.0

 | DIF
(µgg ⁻¹)
1.8
1.4
3.9
0.3
2.1
1.9
2.0
0.0
5.0
2.1
1.9
2.0
4.9
1.4
1.5
1.1
2.4
0.0
1.0
2.5
4.4
6.3
 | 20 µm
DIF%
(%)
4.6
0.11
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
13.6
4.03
4.37
1.9
2.7
6.3
0.0
2.7
3.6
6.50
12.7
14.84 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu {}_{E} {}_{E} {}_{C}^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.12\\ 1.88\\ 1.12\\ 1.80\\ 1.47\\ 1.80\\ 1.47\\ 1.87\\ 2.66\\ 1.89\\ \end{array}$ | RSD
(%)
3.25
5.04
4.0
3.30
5.95
5.04
4.96
3.30
5.4
3.36
7.82
10.1
1.76
2.45
2.45
2.45
2.83
4.62
3.83
6.7
4.56
6.81
3.86
 | Sensitivity
(cps/ <u>µgg⁻¹)</u>
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176 | DL (μ g, g ⁻¹) 0.003 0.082 0.001 0.034 0.002 0.018 0.005 0.005 0.005 0.005 0.002 0.018 0.002 0.013 0.035 0.001 0.002 0.001 0.002 0.001 0.004 0.003 0.004
 | $\begin{array}{c} \hline AV \\ (\mugg^{-1}) \\ 39.7 \\ 40.1 \\ 41.3 \\ 39.2 \\ 39.8 \\ 37.0 \\ 40.8 \\ 41.6 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 37.2 \\ 36.8 \\ 14.1 \\ 43.6 \\ 28.8 \\ 43.5 \\ 39.1 \\ 47.9 \\ \end{array}$
 | DIF
(µgg ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9
4.4
5.2 | 10 μ m DIF% (%) 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 11.0 10.4 4.3 17.25 1.9 2.3 0.5 5.7 16.5 2.4 12.6 12.27 12.7 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mu_{EE}^{-1} \right) \\ 2.35 \\ 4.38
\\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.72 \\ 4.67 \\ 1.75 \\ 1.99 \\ 1.06 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.44 \\ 2.31 \\ 1.44 \\ 2.31 \\ 3.09 \end{array}$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
5.43
13.33
12.55
5.43
13.33
12.55
5.43
2.81
5.92
2.63
6.26
2.1.4
3.31
5.91
6.26
2.1.4 | $\begin{array}{c} \text{Sensitivity} \\ (\text{cps} / \mu \text{g g}^{-1}) \\ 59 \\ 6 \\ 70 \\ 55 \\ 11 \\ 28 \\ 4 \\ 15 \\ 5 \\ 59 \\ 84 \\ 106 \\ 55 \\ 91 \\ 15 \\ 3 \\ 28 \\ 34 \\ 102 \\ \end{array}$ | $\begin{array}{c} {\color{black} DL} \\ (\mu {\color{black} g {\color {\color{black} g {\color {\color{black} g {\color {\color{black} g {\color {\colorblack} g {\color {\color {\color {\color{black} g {\color {\color{black} g {\color {\color {\color {\color{black} g {\color {\color{black} g {\color {\color {\color {\color {\color {\color {\color {black} g {\color $ |
| Sc
TiV
Cr
Mn
Co
N
Cu
Zn
Gae
As
Rb
Sr
Y
Zr
Nb
Mod
Sn
Sb
S
Ba | $\begin{array}{c} (\mu_{B}g^{-1}) \\ (\mu_{B}g^{-1}) \\ 39.9 \\ 44 \\ 38.8 \\ 36.4 \\ 38.7 \\ 35.5 \\ 38.8 \\ 35.5 \\ 38.8 \\ 35.7 \\ 38.7 \\ 36.1 \\ 35.7 \\ 36.1 \\ 36.1 \\ 35.7 \\ 36.1 \\ 37.9 \\ 38.9 \\ 37.4 \\ 28.1 \\ 38.6 \\ 34.7 \\ 42.7 \\ 39.3 \\ \end{array}$

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
0.0
2.5
33.3
8.0
203
0.0 | AV (μ g g g^{-1}) 38.1 42.6 42.7 36.7 36.6 35.5 43.8 39.9 37.2 38.9 41.0 34.3 76.9 39.4 40.3 38.4 27.1 41.1 39.1 49.0

 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \\ 1.0
\\ 1.0 \\$ | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.5
0.77
5.53
4.9
5.29
13.6
4.03
4.37
4.9
5.29
13.6
4.03
4.37
1.9
2.7
6.3
0.0
2.7
3.6
6.50
12.7
14.84
2.2 | $\begin{array}{c} \text{SD} \ (1\sigma)\\ (\muee^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.60\\ 3.21\\ 3.47\\ 1.82\\ 1.12\\ 1.80\\ 1.12\\ 1.82\\ 1.88\\ 0.60\\ \end{array}$ | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
3.30
5.4
3.86
7.82
2.78
4.62
3.83
4.62
3.83
4.62
3.83
4.62
6.81
3.86
6.81
3.86
 | Sensitivity
(cps/ µg g ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
89
27
10
114
156
189
97
173
30
7
55
60
176
25 | DL (µ g g '') 0.003 0.082 0.001 0.334 0.002 0.013 0.002 0.013 0.001 0.002 0.013 0.001 0.002 0.013 0.001 0.002 0.001 0.002 0.001 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004
 | $\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.8 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,0 \\ 40.8 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 36,8 \\ 76,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 43,6 \\ 28,8 \\ 43,5 \\ 39,1 \\ 47,9 \\ 39,8 \\ \end{array}$
 | $\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ \end{array}$ | 10 μm DIF% (%) 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 11.0.4 4.3 17.25 5.7 16.5 5.7 16.5 2.4 12.6 12.6 12.6 12.6 12.6 12.6 12.7 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\
\left(\mugg^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.72 \\ 4.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.04 \\ 1.05 \\ 1.94 \\ 1.05 \\ 1.94 \\ 1.05 \\ 1.23 \\ 1.23 \\ 6.17 \\ 1.44 \\ 2.31 \\ 3.09 \\ 2.62 \end{array}$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
4.05
5.43
13.35
5.43
13.35
5.43
13.35
5.467
5.281
5.09
2.63
6.263
6.263
6.263
6.263
6.264
6.59 | Sensitivity
(cps/ µ g g ⁻¹)
59
6
70
55
11
28
4
4
55
59
84
15
55
84
15
55
84
106
55
55
91
15
3
28
34
102
14 | DL (µ g g -1) 0.004 0.180 0.005 0.078 0.005 0.048 0.003 0.033 0.114 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.004 0.002 0.014 0.147 0.006 0.002 0.025 |
| Sc Ti
V Cr
Mno
Ni
Cu
Zn
Ga
Ge
Sr
Y
Zr
b
Mo
Cd
Sb
Sb
Sb
Ba | RV
(μgg ⁻¹)
39.9
44
38.8
36.4
38.7
35.5
38.8
37.8
39.1
36.1
35.7
31.4
38.9
37.4
38.9
37.4
38.9
37.4
38.9
37.4
38.9
37.4
38.9
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37.4
38.9
37.4
37.9
37.5
37.5
37.5
37.5
37.5
37.5
37.5
37.5

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
0.0
2.5
33.3
8.0
203
0.0
2.7 | AV (μgg ⁻¹) 38.1 42.6 42.7 36.7 35.5 43.8 39.9 37.2 38.9 32.8 76.9 39.4.0 38.9 34.3 39.1 40.2 34.3

 | DIF
(µgg ⁻¹)
1.8
1.4
3.9
0.3
2.1
1.9
2.0
2.0
1.9
2.0
2.1
1.9
2.0
1.4
1.5
1.1
2.4
0.0
1.0
2.5
4.4
6.3
0.9
1.6
 | 20 µm
DIF%
(%)
4.6
0.77
5.6
0.11
12.77
5.53
4.9
5.29
4.9
5.29
4.03
4.37
1.36
4.03
4.37
1.37
6.3
0.0
2.7
3.6
6.50
2.7
3.6
6.50
2.7
1.3.6
4.03
4.3
2.7
6.3
0.0
2.7
1.3.6
6.5
6.5
5.5
2.7
1.3.6
4.03
4.3
2.7
1.3.6
4.03
4.3
2.7
6.3
0.0
2.7
1.3.6
6.5
6.5
1.3.6
4.03
4.37
1.3.7
6.3
0.07
1.4.7
1.4.7
1.4.7
1.4.7
1.4.7
1.4.7
1.5.6
1.3.6
1.3.6
1.3.6
1.3.6
1.3.6
1.3.7
1.3.6
1.3.6
1.3.7
1.3.6
1.3.6
1.3.7
2.7
1.3.6
1.3.6
1.3.7
2.7
1.3.6
1.3.6
1.3.7
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1.3.6
1.3.6
1.3.7
2.7
1.3.6
1.3.7
2.7
1.3.6
1.3.7
2.7
1.4.8
2.7
2.7
2.7
2.7
2.7
2.7
2.7
2.7 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu \mbox{\tiny E} \mbox{\tiny g}^{-1})\\ 1.24\\ 1.72\\ 1.8\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.12\\ 1.88\\ 1.12\\ 1.12\\ 1.80\\ 1.47\\ 1.80\\ 1.47\\ 1.87\\ 2.66\\ 1.89\\ 0.60\\ 1.29\end{array}$ | RSD
(%)
3.25
5.04
4.0
3.30
5.95
5.04
4.96
3.30
5.4
3.30
5.4
3.86
7.82
10.1
1.76
2.45
2.83
2.78
4.62
3.83
6.81
3.86
6.81
3.86
 | Sensitivity
(cps/ <u>µgg⁻¹)</u>
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234 | DL (μ g, g ⁻¹) 0.003 0.082 0.001 0.034 0.002 0.018 0.005 0.003 0.004 0.005 0.005 0.005 0.005 0.005 0.0063 0.001 0.002 0.001 0.002 0.001 0.0045 0.003 0.001 0.001 0.0045 0.001 0.001 0.001 0.001
 | $\begin{array}{c} \hline AV \\ (\mugg^{-1}) \\ 39.7 \\ 40.1 \\ 41.3 \\ 39.2 \\ 39.8 \\ 37.0 \\ 40.8 \\ 41.6 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 37.2 \\ 36.8 \\ 14.1 \\ 43.6 \\ 28.8 \\ 43.5 \\ 39.1 \\ 47.9 \\ 37.2 \\ 36.8 \\ 147.9 \\ 37.2 \\ $
 | DIF
(µgg ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.7
4.9 | 10 μ m DJF% (%) (%) 0.6 0.7.6 2.8 4.1 10.15 16.3 11.0 10.4 4.3 17.25 1.9 2.3 0.5 5.7 16.6 12.27 1.2.6 12.27 1.2 3.5 5.5 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mu_{EE}^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.37 \\
1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.72 \\ 4.67 \\ 1.75 \\ 1.99 \\ 1.06 \\ 2.73 \\ 1.08 \\ 2.73 \\ 1.08 \\ 2.13 \\ 1.08 \\ 2.13 \\ 1.08 \\ 2.13 \\ 1.08 \\ 2.13 \\ 1.44 \\ 2.31 \\ 1.44 \\ 2.31 \\ 1.44 \\ 2.31 \\ 1.65 \\ 1.55$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
13.95
5.43
12.55
5.43
2.81
5.09
2.63
6.26
21.4
3.31
6.26
21.4
4.44 | Sensitivity
(cps/ µgg ⁻¹)
59
6
70
55
11
28
4
4
48
15
5
59
84
4
106
55
91
15
3
28
34
102
14
118 | DL
(μgg ⁻¹)
0.004
0.005
0.078
0.005
0.048
0.003
0.008
0.003
0.114
0.003
0.004
0.003
0.004
0.003
0.004
0.002
0.002
0.0147
0.010
0.002
0.002
0.002 |
| Sc Ti V
Cr M Co Ni U
Ga Ge s
Sr Y
Zr Nb M Cd Sn Sb s
La
C | RV (μ g g -1) 39.9 38.8 36.4 38.7 35.5 38.8 36.4 35.7 39.1 35.5 36.1 35.7 36.1 35.7 36.1 37.9 36.1 37.9 38.9 37.4 28.1 34.7 38.6 34.7 32.3 36.2 39.3 36.6

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
0.0
2.5
33.3
8.0
203
0.0
2.7
1.2 | AV (μ ε ε ⁻¹) 38.1 42.6 42.7 36.7 36.8 35.5 43.8 39.9 37.2 38.9 41.0 34.3 32.8 76.9 39.4 40.3 38.4 27.1 49.0 40.2 34.4 27.4

 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \\ 1.0 \\
1.0 \\ 1.0 \\$ | 20 µm
DIF%
(%)
4.6
3.1
10.2
5.6
0.11
12.77
5.53
4.9
5.29
5.29
5.29
5.29
13.6
4.03
4.37
1.9
2.7
3.6
6.50
12.77
14.84
2.2
4.6
3.7
2.7
3.6
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3.7
3.7 | SD (1σ)
$(\mu e e^{-1})$
1.24
1.72
1.67
2.18
1.84
0.93
2.17
1.32
2.02
1.50
3.21
3.47
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1.82
1.82
1 | RSD
(%)
3.25
4.0
3.90
5.95
5.95
5.04
2.62
4.96
3.30
5.4
3.80
7.82
10.1
1.76
2.43
2.83
2.83
2.83
4.62
4.82
3.86
6.7
4.56
6.81
3.86
1.49
3.75
 | Sensitivity
(cps/ µg g ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234 | DL (µ g g '') 0.003 0.082 0.001 0.334 0.002 0.002 0.018 0.002 0.013 0.001 0.002 0.013 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.004 0.004 0.004 0.004 0.001 0.002
 | $\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,8 \\ 39,8 \\ 37,0 \\ 40.8 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,0 \\ 40.8 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 36,8 \\ 76,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 43,8 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 43,9 \\ 39,1 \\ 47,9 \\ 39,1 \\ 47,9 \\ 39,1 \\ 47,9 \\ 37,2 \\ 20,2$
 | $\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.5 \\ 0.5 \\ 1.2 \\ 0.5$ | 10 μm DIF% (%) 0.5 9.0 6.6 2.8 4.1 10.15 16.3 11.0 1.3 10.4 4.3 0.5 5.7 16.5 2.4 12.6 12.6 12.6 12.7 1.2 3.5 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(
\mugg^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.72 \\ 4.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.04 \\ 1.94 \\ 1.04 \\ 1.94 \\ 1.04 \\ 1.94 \\ 1.05 \\ 1.94 \\ 1.94 \\ 1.05 \\ 1.94 \\ 1.94 \\ 1.05 \\ 1.94 \\$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
4.05
5.43
13.33
12.55
5.43
13.33
12.55
5.43
13.33
12.55
5.43
13.33
12.55
5.43
13.33
12.55
5.09
2.63
6.26
2.14
3.31
5.91
6.44
6.59
4.44
4.42 | Sensitivity
(ops/µgg ⁻¹)
59
6
70
55
11
28
4
4
55
59
84
15
55
84
15
55
84
15
55
91
15
3
28
34
102
14
118
119 | $\begin{array}{c} \begin{array}{c} \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$ |
| Sc Ti V
Cr M Co Ni Cu Zn Ge As b
Sr Y Zr Nb Mo Cd n
Sb Sc Sa La Ce | RV
$(\mu g g^{-1})$
39.9
44
38.8
36.4
35.5
38.8
37.8
39.1
36.1
35.7
31.4
78.4
38.9
37.4
38.9
37.4
38.9
37.4
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3.8
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3.8

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
0.0
2.5
33.3
8.0
203
0.0
2.7
1.3 | AV (μ g g ⁻¹) 38.1 42.6 42.7 36.7 35.5 43.8 39.9 37.2 38.9 34.3 32.8 76.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.4 39.1 41.1 39.1 41.2 34.3 38.9 38.9 34.4 37.4

 | DIF
(µgg ⁻¹)
1.8
1.4
3.9
0.3
2.1
1.9
2.0
5.0
2.1
1.9
2.0
4.9
1.4
1.5
1.1
2.4
0.0
1.0
2.5
4.4
6.3
0.9
1.6
1.0
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.111
12.77
5.53
4.9
2.7
6.3
0.0
2.7
13.6
6.5
0.2
7
12.7
12.7
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12.7 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu \mathrm{gg} \mathrm{g}^{-1})\\ 1.24\\ 1.72\\ 1.8\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.12\\ 1.12\\ 1.88\\ 1.12\\ 1.88\\ 1.12\\ 1.80\\ 1.48\\ 1.82\\ 1.87\\ 2.66\\ 1.89\\ 0.62\\ 0.62\\ 1.89\\ 0.89\\$ | RSD
(%)
3.25
4.0
3.90
5.95
5.04
2.62
4.96
3.30
5.4
3.80
5.4
3.80
4.62
2.45
2.45
2.45
2.45
2.45
2.45
2.45
2.4
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229 | DL (μ g, g ⁻¹) 0.003 0.082 0.001 0.034 0.002 0.018 0.005 0.003 0.004 0.005 0.005 0.005 0.005 0.005 0.0063 0.0013 0.002 0.001 0.002 0.001 0.001 0.002 0.001 0.001 0.001 0.001 0.001
 | $\begin{array}{c} \hline AV \\ (\mu_{\mbox{g}} e^{-1}) \\ \hline (\mu_{\mbox{g}} e^{-1}) \\ \hline 39.7 \\ 40.1 \\ 41.3 \\ 39.2 \\ 39.8 \\ 37.0 \\ 40.8 \\ 41.6 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 37.2 \\ 36.8 \\ 14.1 \\ 43.6 \\ 28.8 \\ 43.5 \\ 39.1 \\ 47.9 \\ 39.8 \\ 37.2 \\ 39.2 \\ 39.2 \\ 37.2 \\ 37$
 | DIF
(<u>µgg</u> ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.5
1.2
0.5 | 10 µm
DIF%
(%)
0.5
9.0
6.6
7.6
2.8
4.1
10.15
5.1
10.15
5.7
1.2
3.3
0.5
5.7
10.5
5.7
10.5
5.7
12.6
5.2,2
12.6
12.6
12.6
5.2
5.3
5.5
5.5
9.0
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9.5
9.5
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9.5
9.5
9 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mu_{EE}^{-1} \right) \\ 2.35 \\ 4.38
\\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 4.57 \\ 2.23 \\ 4.57 \\ 1.72 \\ 4.09 \\ 1.08 \\ 2.73 \\ 1.94 \\ 1.08 \\ 2.13 \\ 6.17 \\ 1.44 \\ 2.31 \\ 1.44 \\ 2.31 \\ 1.44 \\ 2.31 \\ 1.65$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
13.95
5.43
12.55
5.43
2.81
5.92
2.81
5.92
2.81
5.92
2.83
6.26
21.4
6.26
21.4
6.59
6.44
4.44
4.20 | Sensitivity
(cps/ µ g g ⁻¹)
59
6
70
55
11
28
4
4
48
15
5
59
84
106
55
91
15
3
28
34
102
14
118
119 | DL
(μgg ⁻¹)
0.004
0.005
0.078
0.005
0.048
0.003
0.008
0.133
0.004
0.033
0.114
0.003
0.004
0.003
0.004
0.002
0.002
0.002
0.002
0.002 |
| Sc Ti
V Cr M Co Ni U
Ga Ge S Y Zr Nb M Cd Sn b
B La C Pr | RV (μ g g -1) 39.9 38.8 36.4 38.7 35.5 38.8 36.7 35.7 39.1 36.1 36.1 35.7 31.4 78.4 38.3 37.9 37.9 38.9 37.4 28.1 34.7 34.7 38.6 38.4 37.9 37.9 37.9 36.3

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
0.0
2.5
33.3
8.0
203
0.0
2.7
1.3
1.3 | $\begin{array}{c} & {\sf AV} \\ & (\mu {\it g} {\it g} {\it g}^{-1}) \\ & 38.1 \\ & 42.6 \\ & 42.7 \\ & 36.6 \\ & 35.5 \\ & 33.5 \\ & 35.5 \\ & 35.5 \\ & 35.5 \\ & 35.5 \\ & 35.5 \\ & 35.5 \\ & 35.5 \\ & 35.5 \\ & 35.5 \\ & 35.5 \\ & 39.9 \\ & 35.8 \\ & 40.3 \\ & 32.8 \\ & 76.9 \\ & 39.4 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 37.4 \\ & 33.8 \\ & 33.8 \\ \end{array}$

 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \\ 1.0
\\ 1.0 \\$ | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
13.6
4.03
4.37
1.9
2.7
6.50
0.0
2.7
3.6
6.50
0.12.7
14.84
2.2
4.6
2.7
10.8 | $\begin{array}{c} \text{SD} \ (1\sigma)\\ (\muee^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.60\\ 3.21\\ 3.47\\ 1.82\\ 1.12\\ 1.81\\ 1.12\\ 1.82\\ 1.87\\ 1.82\\ 1.89\\ 0.60\\ 1.29\\ 0.60\\ 1.29\\ 0.62\\ 1.10\\ \end{array}$ | RSD
(%)
3.25
4.0
3.30
5.5,95
5.04
2.62
2.45
2.45
2.45
2.78
4.62
3.83
4.62
3.83
6.7
4.56
6.81
3.37
5.16
3.325
 | Sensitivity
(cps/ µg g ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293 | DL
(µgg(')
0.003
0.082
0.001
0.034
0.002
0.018
0.002
0.013
0.002
0.013
0.002
0.013
0.002
0.001
0.001
0.001
0.004
0.004
0.004
0.001
0.001
0.001
0.001
 | $\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,8 \\ 39,8 \\ 37,0 \\ 40.8 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,0 \\ 40.8 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.6 \\ 28,8 \\ 43,5 \\ 39,1 \\ 47,9 \\ 39,1 \\ 47,9 \\ 39,2 \\ 37,2 \\ 39,2 \\ 38,0 \\ \end{array}$
 | $\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 5.4 \\ 1.5 \\ 0.9 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ \end{array}$ | $\begin{array}{c} 10 \ \mu m \\ DIF\% \\ (\%) \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 10.1 \\ 10.15 \\ 10.1 \\ 10.1 \\ 10.4 \\ 4.3 \\ 17.25 \\ 1.9 \\ 2.3 \\ 0.5 \\ 7.1 \\ 16.5 \\ 2.2 \\ 1.2 \\ 3.5 \\ 2.2 \\ 0.$ | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\
\left(\mugg^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.72 \\ 4.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.04 \\ 1.03 \\ 1.94 \\ 1.04 \\ 1.04 \\ 1.05 \\ 1.55 \\ 1.65 \\$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
4.05
5.43
13.33
12.55
5.43
13.33
12.55
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5.61
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5.55
14.40
5.55
14.40
5.55
14.40
5.55
5.55 | Sensitivity
(cps/ µ g g ⁻¹)
59
6
70
55
11
28
4
4
55
59
84
15
55
84
15
55
84
106
55
91
15
3
28
34
102
14
118
119
144 | $\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$ |
| Sc Ti V Cr Mn Co Ni Cu Zn Ga e As Kb Sr Y Zr b Mo Cd n Sb Ss Ba La Ce Pr Nd | RV
$(\mu g g^{-1})$
39.9
44
38.4
36.4
35.5
38.8
37.8
39.1
36.1
35.7
31.4
78.4
38.9
37.4
38.9
37.4
38.9
37.4
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 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
0.0
2.5
33.3
8.0
203
0.0
2.7
1.3
1.3
1.3
0.0 | AV (μ g g ⁻¹) 38.1 42.6 42.7 36.7 35.5 43.8 39.9 37.2 38.9 34.3 32.8 76.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 34.1.1 39.1 41.1 39.1 41.1 39.1 41.1 34.3 32.3

 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \\ 1.0 \\ 2.5 \\ 4.4 \\ 6.3 \\ 0.9 \\ 1.6 \\ 1.0 \\ 4.1 \\ 1.6 \\ 1.0 \\ 4.1 \\ 3.2 \\ \end{array}$
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.111
12.77
5.53
4.9
13.6
4.03
4.37
1.9
2.7
6.3
0.0
2.7
3.6
6.50
12.77
14.84
2.2
4.6
2.7
12.77
14.84
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10.277777777777777777777777777777777 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mu\kappas^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.12\\ 1.32\\ 1.88\\ 1.12\\ 1.88\\ 1.12\\ 1.80\\ 1.47\\ 1.80\\ 1.48\\ 1.89\\ 0.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ \end{array}$ | RSD
(%)
3.25
5.95
5.95
5.04
2.62
4.96
3.30
5.4
4.96
3.30
5.4
4.96
3.83
6.7
6.81
3.86
6.7
4.62
3.83
6.7
4.62
3.83
6.7
1.49
3.25
5.40
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50 | DL (μ g, g ⁻¹) 0.003 0.082 0.001 0.034 0.002 0.118 0.003 0.063 0.003 0.003 0.004 0.005 0.063 0.002 0.013 0.035 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.0045 0.003 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
 | $\begin{array}{c} \hline AV \\ (\mu_{g}e^{-1}) \\ 39.7 \\ 40.1 \\ 41.3 \\ 39.2 \\ 39.8 \\ 37.0 \\ 40.8 \\ 41.6 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 37.2 \\ 36.8 \\ 14.1 \\ 43.6 \\ 43.5 \\ 39.1 \\ 47.9 \\ 39.8 \\ 37.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 38.0 \\ 35.2 \\ \end{array}$
 | DIF
(<u>µgg</u> ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.7
4.9
4.4
5.2
0.3 | $\begin{array}{c} 10 \ \mu m \\ DIF\% \\ (\%) \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 7.6 \\ 10.15 \\ 10.15 \\ 11.0 \\ 1.9 \\ 2.3 \\ 0.5 \\ 5.7 \\ 16.5 \\ 7.16 \\ 1.9 \\ 2.4 \\ 12.6 \\ 12.27 \\ 1.2 \\ 0.5 \\ 2.4 \\ 12.2 \\ 0.2 \\ 0.9 \\ 0.9 \\ 0.9 \\ 0.9 \\ 0.0 \\ $ | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mu_{EE}^{-1} \right) \\
2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 4.57 \\ 2.23 \\ 4.57 \\ 1.72 \\ 4.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 2.73 \\ 1.94 \\ 1.08 \\ 2.13 \\ 6.17 \\ 1.44 \\ 2.31 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.29 \end{array}$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
5.81
4.05
5.81
4.05
5.81
4.67
5.281
5.43
13.95
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13.95
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13.95
5.43
4.67
5.02
2.63
6.26
2.1.4
3.31
6.26
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5.05
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1.5 | Sensitivity
(cps/ <u>µ g g⁻¹)</u>
59
6
70
55
11
28
4
4
48
15
5
59
84
15
5
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106
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102
14
118
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144
26 | DL
(μ g g g ⁻¹)
0.004
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0.005
0.048
0.003
0.008
0.133
0.004
0.033
0.114
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| ScTiV
CrM CoNiu
Gaas ARb SrY
ZrNb M Cd Sn b Ss Baace
Prd Sm | RV (μ g g -1) 39.9 38.3 36.4 38.7 35.5 38.8 36.4 35.7 38.7 39.1 36.1 35.7 36.1 37.9 36.1 37.9 38.3 37.9 38.3 37.4 28.1 34.7 38.6 38.4 37.9 38.4 37.9 35.5 38.4 37.9 35.7

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
2.5
33.3
8.0
203
0.0
2.7
1.3
1.3
0.0
0.0 | $\begin{array}{c} & {\sf AV} \\ & (\mu {\it g} {\it g} {\it g}^{-1}) \\ & 38.1 \\ & 42.6 \\ & 42.7 \\ & 36.6 \\ & 35.5 \\ & 33.8 \\ & 39.9 \\ & 37.2 \\ & 38.9 \\ & 41.0 \\ & 34.4 \\ & 76.9 \\ & 39.4 \\ & 40.3 \\ & 38.9 \\ & 40.3 \\ & 32.8 \\ & 76.9 \\ & 39.4 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 40.3 \\ & 38.4 \\ & 27.1 \\ & 38.4 \\ & 37.4 \\ & 33.8 \\ & 32.3 \\ & 32.5 \\ & 35.0 \\ & 50.0 \\ & $

 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 2.7 \\ 1.0
\\ 1.0 \\$ | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
13.6
4.03
4.37
1.9
5.29
13.6
6.50
12.7
3.6
6.50
12.7
14.8
8.9
2.7
10.8
8.9
7.0 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mueg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.50\\ 3.21\\ 3.47\\ 1.82\\ 1.88\\ 1.12\\ 1.12\\ 1.82\\ 1.87\\ 1.82\\ 1.87\\ 1.82\\ 1.89\\ 0.60\\ 1.29\\ 0.60\\ 0.20\\ 0.$ | RSD
(%)
3.25
5.95
5.5.95
5.5.94
2.62
2.45
2.83
3.86
7.82
10.1
1.76
2.45
2.83
4.62
3.83
6.81
6.81
6.81
6.81
1.66
3.25
5.40
4.04
 | Sensitivity
(cps/ µg g ⁻¹)
114
6
101
11
132
99
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
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234
229
293
50
44 | DL
(µ g g '')
(µ g g '')
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0.0007
 | $\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ (\mu \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,8 \\ 39,8 \\ 37,0 \\ 40.8 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,0 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 42.8 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 43.8 \\ 38,1 \\ 43.5 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 37,2 \\ 39,2 \\ 38,0 \\ 35,2 \\ 39,3 \\ 39,3 \\ \end{array}$
 | $\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \end{array}$ | $\begin{array}{c} 10 \ \mu m \\ DIF\% \\ (\%) \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 0.5 \\ 0.5 \\ 0.6 \\ 10.4 \\ 4.3 \\ 17.25 \\ 1.9 \\ 0.5 \\ 7.1 \\ 16.5 \\ 2.2 \\ 0.5 \\ 7.1 \\ 16.5 \\ 2.2 \\ 1.2 \\ 3.5 \\ 2.2 \\ 0.2 \\ $ | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\
\left(\mugg^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.72 \\ 4.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.95 \\$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
13.95
5.43
13.33
12.55
5.43
13.33
12.55
5.43
2.63
6.26
4.67
5.32
2.81
3.31
5.91
4.64
4.65
5.65
3.65
3.65
3.65
3.65
3.65 | Sensitivity
(cps/ µ g g ⁻¹)
59
6
70
55
11
28
4
15
5
59
84
15
55
84
15
55
84
106
55
55
91
15
3
28
34
102
14
118
119
144
26
22 | DL (µ g g e^{-1}) 0.004 0.180 0.005 0.078 0.005 0.048 0.003 0.033 0.114 0.003 0.006 0.003 0.004 0.003 0.004 0.005 0.006 0.002 0.014 0.147 0.006 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.003 |
| Sci V Cr Mn Coi Lung Gae As Br Y Zr bhodd Sb Sca Baace Proderson Sci Sb Sca Baace Proderson Sci Sb Sca Baace Proderson Sci Sca | RV
(μgg ⁻¹)
39.9
44
38.8
36.4
35.5
38.8
37.8
39.1
36.1
35.7
31.4
78.4
38.9
37.4
38.9
37.4
38.9
37.4
38.9
37.4
38.9
37.4
38.9
37.4
38.9
37.4
38.9
37.4
38.9
37.4
38.9
37.5
37.7
35.5
38.4
38.9
37.5
37.7
37.5
37.7
37.5
37.7
37.5
37.5

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
0.0
2.5
33.3
8.0
203
0.0
2.7
1.3
1.3
1.3
0.0
0.0
0.0 | AV (μ g g ⁻¹) 38.1 42.6 42.7 36.7 35.5 43.8 39.9 37.2 38.9 34.3 32.8 76.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 34.1 39.1 49.0 40.3 37.4 32.8 32.8 32.3 32.4 37.4 32.8 32.7

 | DIF
(µgg ⁻¹)
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
2.0
0.0
5.0
2.1
1.9
2.0
4.9
1.4
1.5
1.1
2.4
0.0
1.0
2.5
4.4
6.3
0.9
1.6
1.0
4.1
1.0
2.5
4.4
3.2
2.7
2.7
3.0
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
4.9
5.29
4.9
5.29
4.9
5.29
4.9
2.7
6.3
0.0
2.7
14.84
2.2
7
10.8
9
7.0
8.9
7.0
8.4 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mu\kappas^{-1})\\ 1.24\\ 1.72\\ 1.8\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.12\\ 1.32\\ 1.88\\ 1.12\\ 1.88\\ 1.12\\ 1.88\\ 1.12\\ 1.80\\ 1.48\\ 1.89\\ 0.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.62\\ 1.09\\ 0.62\\ 1.10\\ 0.62\\ 1.09\\ 0.62\\ 0.09\\ 0$ | RSD
(%)
3.25
4.0
3.90
5.04
2.62
4.96
3.30
5.4
3.86
7.82
2.45
2.45
2.45
2.45
2.83
2.78
4.62
2.83
2.78
4.62
6.81
3.85
6.7
4.56
6.81
3.85
5.40
4.04
4.96
3.25
5.40
4.04
4.96
3.25
5.40
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3.25
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4.96
3.25
5.40
4.96
3.25
5.40
4.96
3.25
5.40
4.96
3.26
5.45
5.45
5.45
5.45
5.45
5.45
5.45
5.4
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44 | DL (μ g, g ⁻¹) 0.003 0.082 0.001 0.034 0.002 0.118 0.003 0.063 0.003 0.003 0.005 0.063 0.002 0.013 0.035 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.0045 0.003 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
 | $\begin{array}{c} AV \\ (\mu_{R} e^{-1}) \\ 39.7 \\ 40.1 \\ 41.3 \\ 39.2 \\ 39.8 \\ 37.0 \\ 40.8 \\ 41.6 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 37.2 \\ 36.8 \\ 14.1 \\ 43.6 \\ 43.5 \\ 39.1 \\ 47.9 \\ 39.8 \\ 37.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 39.2 \\ 39.2 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 39.1 \\ 47.9 \\ 4$
 | DIF
(<u>µgg</u> ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.7
4.9
4.4
5.2
0.7
0.2
5.5
2.0
0.2
0.2
0.2
0.2
5.5
0.2
0.2
0.2
0.2
0.2
0.2
0.2
0.2
0.2
0.2 | 10 μm DIF% (%) 0.5 9.0 0.5 9.0 6.6 7.6 7.10 10.15 11.0 11.0 2.3 0.5 5.7 16.5 12.6 12.27 1.2 2.3 2.2 0.9 4.2 0.9 4.2 1.4 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mu_{EE}^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69
\\ 4.57 \\ 2.23 \\ 4.57 \\ 2.23 \\ 4.57 \\ 1.22 \\ 4.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 2.13 \\ 6.17 \\ 1.44 \\ 2.31 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.29 \\ 3.47 \\ 1.44 \\ 1.41 \\ 1.44 \\ 1.65 \\ 1.29 \\ 3.47 \\ 1.44 \\ 1.165 \\ 1.29 \\ 3.47 \\ 1.44 \\ 1.165 \\ 1.29 \\ 3.47 \\ 1.44 \\ 1.165 \\ 1.29 \\ 3.47 \\ 1.44 \\ 1.165 \\ 1.29 \\ 3.47 \\ 1.44 \\ 1.165 \\ 1.29 \\ 3.47 \\ 1.44 \\ 1.165 \\ 1.29 \\ 3.47 \\ 1.44 \\ 1.165 \\ 1.29 \\ 3.47 \\ 1.44 \\ 1.165 \\ 1.29 \\ 3.47 \\ 1.44 \\ 1.165 \\ 1.29 \\ 3.47 \\ 1.44 \\ 1.165 \\ 1.29 \\ 3.47 \\ 1.44 \\ 1.165 \\ 1.29 \\ 1.165 \\ 1.165 \\ 1.29 \\ 1.165 \\ 1.29 \\ 1.165 \\ 1.29 \\ 1.165 \\ 1.165 \\ 1.29 \\ 1.165 \\ 1.29 \\ 1.165 \\ 1.29 \\ 1.165 \\ 1.165 \\ 1.29 \\ 1.165 \\ 1.29 \\ 1.165 \\ 1$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
5.81
4.05
5.81
4.05
5.81
4.67
5.32
4.67
5.32
4.67
5.32
4.67
5.32
4.67
5.32
5.43
3.31
5.91
6.44
4.20
5.65
5.65
5.65
5.65
5.65
5.65
5.65
5.6 | Sensitivity
(cps/ µ g g ⁻¹)
59
6
70
55
11
28
4
4
48
15
5
59
84
106
55
91
15
3
28
34
106
55
91
15
3
28
34
102
14
118
119
144
26
22
81 | DL
(μεg ⁻¹)
0.004
0.005
0.078
0.005
0.048
0.003
0.008
0.133
0.004
0.033
0.114
0.003
0.004
0.003
0.004
0.002
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0.002
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0.002
0.002 |
| Sci V Cr Mn Colin Con Barrier Con Sci V Cr Mn Colin Con Barrier Con Sci Con Barrier Con Sci Con Barrier Con Sci Con Sc | RV (μg g ⁻¹) 39.9 44 38.7 38.8 36.4 35.5 38.8 37.7 36.1 37.9 37.4 28.1 36.1 37.9 37.4 28.1 38.6 34.7 34.7 38.6 38.4 37.9 38.6 38.4 37.9 38.4 37.9 35.5 37.7 35.6 37.7

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
2.5
33.3
8.0
203
0.0
2.7
1.3
1.3
0.0
0.0
2.7
1.3
1.3
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0 | AV (μ ε ε ⁻¹) 38.1 42.6 42.7 36.7 36.8 35.5 43.8 39.9 37.2 38.9 41.0 34.3 76.9 39.4 40.3 38.4 27.1 49.0 38.4 27.1 49.1 33.8 32.3 35.5 33.8 32.5 35.0 32.5 32.6

 | DIF
(µgg ⁻¹)
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
2.0
4.9
1.4
1.5
1.4
1.5
1.4
1.5
1.1
2.4
0.0
1.0
1.2
4.9
1.4
1.5
1.4
3.9
1.4
1.5
1.4
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1.5
1.4
1.5
1.7
1.7
1.7
1.7
1.7
1.7
1.7
1.7 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.0.11
12.77
5.53
4.9
5.29
13.6
4.03
2.7
6.3
0.0
2.7
3.6
6.30
0.2,7
3.6
6.30
0.2,7
3.6
0.3,7
12,7
4.8
4.37
12,7
6.3
0.0,7
3.6
6.3
0.0,7
12,7
14,8
4.9
2.7
8,6
12,7
12,7
14,8
4.9
2.7
8,6
12,7
14,9
14,6
14,6
14,6
14,6
14,6
14,6
14,6
14,6
 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mueg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.32\\ 1.32\\ 1.50\\ 3.21\\ 3.47\\ 1.82\\ 1.12\\ 1.82\\ 1.88\\ 1.12\\ 1.87\\ 1.82\\ 1.87\\ 1.82\\ 1.89\\ 0.60\\ 1.29\\ 0.60\\ 0.60\\ 1.29\\ 0.60\\ 0.$ | RSD
(%)
3.25
4.0
5.95
5.04
4.96
3.30
5.4
3.86
7.82
1.76
2.45
2.45
2.45
2.45
2.45
4.62
3.83
6.7
4.62
3.83
6.7
4.62
3.83
6.7
4.56
6.81
3.84
3.55
4.05
5.44
5.44
5.45
5.44
1.76
2.45
5.45
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5.44
5.44
5.44
5.440
7.44
5.44
5.44
5.44
5.44
5.44
5.44
5.44 | Sensitivity
(cps/ µg g ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44
160
 | DL
(µ g g (1)
(µ g (1))
(µ g (1)
(µ g (1))
(µ g (1))
(
 | AV (μgg') 39,7 40.1 41.3 39,2 39,8 37,0 40.6 32,7 41.6 32,7 41.6 32,7 41.6 32,7 41.1 43.8 76.9 37.4 38.1 41.1 43.5 39.1 47.9 39.1 47.9 39.1 47.9 39.2 38.0 35.2 39.3 35.1 35.2 39.3 35.1
 | $\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 5.4 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 1.6 \\ 0.5 \\ 0.1 \\ 0.5$ | 10 μm DIF% (%) 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 11.0 10.4 4.3 0.5 5.7 1.6.5 2.4 12.6 12.2 3.5 2.2 0.2 0.2 0.2 0.2 0.4 2.3 0.5 5.7 2.4 12.6 12.2 3.5 2.2 0.2 0.2 0.2 0.2 0.4 4.2 | $\begin{array}{c} \text{SD} (1\sigma) \\ (\mugg^{-1}) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.72 \\ 4.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
5.81
4.05
13.33
13.95
5.43
13.33
13.35
5.43
2.81
5.91
6.26
21.4
4.20
5.65
3.65
3.65
3.65
3.65
3.65
3.65
3.65
 | Sensitivity
(cps/ µg g ⁻¹)
59
6
70
55
11
28
4
4
55
59
84
15
55
84
15
55
84
15
55
91
15
3
28
34
102
14
118
119
144
26
22
81
27 | DL (µ g g e^{-1}) 0.004 0.180 0.005 0.078 0.005 0.048 0.003 0.033 0.114 0.003 0.004 0.003 0.004 0.003 0.004 0.005 0.006 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.003 |
| Sc Ti V Cr Mn Co Ni Cu n Ga e s Rb Sr Y Zr Nb do G Sn b Sc Ba a ce r Nd Sn b Sc Ba a Ce r Nd Sn E Gd | RV
(μgg ⁻¹)
39.9
44
38.8
36.4
35.5
38.8
37.8
39.1
36.1
35.7
31.4
78.4
38.9
37.4
38.9
37.4
38.9
37.4
38.9
37.4
38.9
37.4
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37.4
38.9
37.4
38.9
37.4
38.9
37.5
5
38.4
38.9
37.5
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37.5
37.7
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37.7
35.5
37.7
35.5
37.7
35.5
37.7
35.7
37.7
35.7
37.7
37

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
0.0
2.5
33.3
8.0
203
0.0
2.7
1.3
1.3
1.3
0.0
0.0
0.0
4.4 | AV (μ g g ⁻¹) 38.1 42.6 35.5 36.67 35.5 33.8 39.9 37.2 38.9 34.3 32.8 76.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 34.1 39.1 49.0 40.3 37.4 32.8 32.4 37.4 32.3 32.6 35.8

 | DIF
(µgg ⁻¹)
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
2.0
0.0
5.0
2.1
1.9
2.0
4.9
1.4
1.5
1.1
2.4
0.0
1.0
2.5
4.4
6.3
0.9
1.6
1.0
4.1
3.2
2.7
3.0
1.5
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
4.9
5.29
5.29
1.3.6
4.03
1.9
2.7
1.8
4.3
4.37
1.9
2.7
1.8
4.8
4.2,7
1.8
8.9
7.0
8.8
4.0
8.4 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mu\kappas^{-1})\\ 1.24\\ 1.72\\ 1.8\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.12\\ 1.32\\ 1.88\\ 1.12\\ 1.88\\ 1.12\\ 1.88\\ 1.12\\ 1.80\\ 1.42\\ 1.87\\ 2.66\\ 1.89\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.62\\ 0.47\\ \end{array}$ | RSD
(%)
3.25
4.0
3.90
5.05
5.04
4.96
3.30
5.4
3.86
7.82
2.45
2.45
2.45
2.45
2.83
2.78
4.62
4.62
4.62
1.49
3.25
5.40
4.04
2.25
5.40
4.04
2.25
2.62
2.83
2.78
4.66
3.25
5.40
4.04
2.62
2.83
2.78
4.05
5.40
4.05
5.40
4.05
5.40
5.41
4.05
5.41
5.41
4.05
5.41
5.42
5.42
5.42
5.42
5.43
5.45
5.45
5.45
5.45
5.45
5.45
5.45
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44
160
47 | DL (µ g, g ⁻¹) 0.003 0.082 0.001 0.034 0.002 0.118 0.003 0.063 0.003 0.003 0.005 0.063 0.002 0.013 0.035 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.001 0.001 0.0045 0.003 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.007 0.007 0.008
 | $\begin{array}{c} \hline AV \\ \hline (\mu_{g}e^{-1}) \\ 39.7 \\ 40.1 \\ 41.3 \\ 39.2 \\ 39.8 \\ 37.0 \\ 40.8 \\ 41.6 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 37.2 \\ 36.8 \\ 37.2 \\ 37.2 \\ 36.8 \\ 39.1 \\ 47.9 \\ 39.8 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.3 \\ 35.2 \\ 39.3 \\ 35.1 \\ 35.2 \\ 35.2 \\ \end{array}$
 | DIF
(<u>µgg</u> ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.7
4.9
4.4
5.2
0.7
0.2
2.2
6.2
0.7
0.2
5.2
2.2
6.2
0.2
0.2
5.5
2.1
1.5
0.2
0.2
5.5
2.5
2.5
2.5
2.5
2.5
2.5
2.5
2.5
2 | 10 μm DIF% (%) 0.5 9.0 0.5 9.0 6.6 7.6 7.10 10.15 11.0 11.0 2.3 0.5 5.7 16.5 12.6 12.27 1.2 2.3 2.2 0.9 4.2 0.9 4.2 1.4 5.8 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mu_{EE}^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.10 \\
1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 4.57 \\ 2.23 \\ 4.57 \\ 1.22 \\ 4.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 2.13 \\ 6.17 \\ 1.44 \\ 2.31 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.87 \\ \end{array}$ | RSD
(%)
5.91
10.9
3.70
11.57
3.31
13.95
5.43
12.55
4.67
5.32
2.81
5.91
6.26
6.26
6.21.4
3.31
5.91
6.26
6.21.4
4.59
5.91
6.44
6.59
5.61
8.83
3.65
8.83
4.01
5.31 | $\begin{array}{c} \text{Sensitivity} \\ (\text{cps} / \mu g g^{-1}) \\ 59 \\ 6 \\ 70 \\ 55 \\ 11 \\ 28 \\ 4 \\ 48 \\ 15 \\ 5 \\ 59 \\ 84 \\ 106 \\ 55 \\ 91 \\ 15 \\ 3 \\ 28 \\ 34 \\ 102 \\ 14 \\ 118 \\ 119 \\ 144 \\ 26 \\ 22 \\ 81 \\ 25 \\ \end{array}$ | DL
(μ g g g ⁻¹)
0.004
0.005
0.078
0.005
0.048
0.003
0.008
0.133
0.004
0.033
0.114
0.003
0.004
0.004
0.002
0.002
0.002
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0.005
0.005
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0.0 |
| Sci V Cr Mn Colin Con Barlow Cr Mn Colin Con Barlow Cr Mn Colin Con Barlow Cr Mn Con Barlow | RV (μgg ⁻¹) 39.9 44 36.4 35.5 38.8 36.1 35.7.8 39.1 36.1 35.7.8 36.1 37.9 38.3 37.9 38.6 34.7 34.7 38.6 38.4 37.9 35.5 37.7 35.6 37.7 37.6

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
2.5
33.3
8.0
203
0.0
2.7
1.3
1.3
0.0
0.0
2.7
1.3
1.3
0.0
0.0
0.0
2.7
1.3
1.3
1.3
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0 | $\begin{array}{c} & {\sf AV} \\ & (\mu \ {\sf g} \ {\sf g}^{-1}) \\ 38.1 \\ 42.6 \\ 42.7 \\ 36.6 \\ 35.5 \\ 35.5 \\ 43.8 \\ 9.9 \\ 37.2 \\ 38.9 \\ 41.0 \\ 34.4 \\ 76.9 \\ 39.4 \\ 40.3 \\ 32.8 \\ 76.9 \\ 39.4 \\ 40.3 \\ 38.9 \\ 40.3 \\ 38.9 \\ 40.3 \\ 38.4 \\ 27.1 \\ 41.1 \\ 39.1 \\ 49.0 \\ 38.4 \\ 27.1 \\ 41.1 \\ 39.1 \\ 49.0 \\ 38.4 \\ 27.1 \\ 31.8 \\ 32.3 \\ 35.0 \\ 32.6 \\ 35.8 \\ 36.0 \\ \end{array}$

 | DIF
(μgg ⁻¹)
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
2.0
4.9
1.4
1.5
1.4
1.5
1.4
1.5
1.4
1.5
1.4
1.5
1.4
1.0
1.0
2.5
4.4
3.0,9
1.6
1.0
1.0
2.5
1.6 | 20
µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.0.11
12.77
5.53
4.9
5.29
13.6
4.03
2.7
6.3
0.0
2.7
3.6
6.3
0.0,27
3.6
0.2,7
3.6
0.3,00
2.7
3.6
0.3,00
2.7
3.6
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3.6
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3.6
0.7
1,00
2.7
7
5.6
0.3
1,00
2.7
7
5.6
0.7
1,00
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7
5.6
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7
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5.6
0.3
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2.7
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7
7
7
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7
7
7
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7
7
7
7
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7
7 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mueg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.32\\ 1.50\\ 3.21\\ 3.47\\ 1.82\\ 1.88\\ 1.12\\ 1.12\\ 1.82\\ 1.87\\ 1.82\\ 1.87\\ 1.82\\ 1.87\\ 1.82\\ 1.89\\ 0.60\\ 1.29\\ 0.60\\ 1.29\\ 0.60\\ 1.29\\ 0.60\\ 1.29\\ 0.60\\ 1.29\\ 0.60\\ 1.29\\ 0.60\\ 1.29\\ 0.60\\ 1.29\\ 0.60\\ 1.29\\ 0.60\\ 1.29\\ 0.60\\ 1.29\\ 0.60\\ 1.38\\ 1.88\\ 1.12\\ 1.88\\ 1.12\\ 1.88\\ 1.12\\ 1.88\\ 1.12\\ 1.18\\ 1.$ | RSD
(%)
3.25
4.0
5.95
5.04
4.96
3.30
5.4
3.86
7.82
2.45
2.45
2.45
2.45
4.62
3.83
6.7
4.56
6.81
3.67
4.56
6.81
1.66
3.25
5.40
1.16
3.25
5.40
1.16
3.25
 | Sensitivity
(cps/ µg g ⁻¹)
114
6
101
11
132
99
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44
160
47
312 | DL (µ g g (1)) (0.003) 0.082 0.001 0.034 0.002 0.018 0.002 0.018 0.002 0.013 0.002 0.013 0.001 0.004 0.001 0.004 0.001 0.004 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001
 | $\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ (\mu \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.6 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,0 \\ 40.6 \\ 39,9 \\ 37,0 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 43.8 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 43.8 \\ 38,1 \\ 43.5 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 37,2 \\ 39,2 \\ 38,0 \\ 35,2 \\ 39,3 \\ 35,1 \\ 35,2 \\ 35,7 \\ \end{array}$
 | $\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 1.9 \end{array}$ | 10 μm DIF% (%) 0.5 9.0 0.5 9.0 10.5 10.6 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 12.6 5.7 2.4 12.6 12.2 3.5 2.2 0.9 4.2 3.5 2.4 12.6 12.2 3.5 2.2 0.9 4.2 3.5 2.2 0.2 0.4 5.0 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1} \right) \\ \left(2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.22 \\ 4.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.21 \\ 1.41 \\ 1.85 \\ 1.65 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.87 \\ 0.77 \\ 0.77 \end{array}$
 | RSD
(%)
5.91
10.9
5.08
3.70
11.57
5.81
4.05
5.43
13.33
13.35
5.43
13.33
13.35
5.43
2.81
5.91
6.26
21.4
6.59
4.44
6.59
4.44
4.20
5.65
3.65
3.65
3.65
3.65
3.65
3.65
3.65 | Sensitivity
(cps/ µ g g ⁻¹)
59
6
70
55
11
28
4
15
5
59
84
15
55
84
15
55
91
15
3
28
34
102
14
118
119
144
26
22
81
225
168 | DL (µ g g e^{-1}) 0.004 0.180 0.005 0.078 0.005 0.033 0.004 0.033 0.004 0.033 0.004 0.003 0.004 0.003 0.004 0.005 0.006 0.002 0.014 0.147 0.006 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.013 0.005 0.002 0.013 0.005 0.002 |
| Sc Ti V Cr M Co Ni Cu La Ge s A B Sr Y Zr M Ko d Sn Sb Ss a La Ce Pr Nd M St G Th V Sn E G d Th V | RV
(<u>µgg⁻¹)</u>
39.9
44
38.8
36.4
35.5
38.8
37.8
39.1
36.1
35.7
31.4
78.4
38.9
37.4
38.9
37.4
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37.4
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37.4
38.9
37.5
37.5
38.4
38.5
37.7
35.5
37.7
35.5
37.7
35.5
37.3
37.6
35.5
37.3
37.6
35.5
37.7
35.5
37.7
37.3
37.6
35.5
37.7
37.3
37.6
35.5
37.7
37.5
37.7
37.5
37.7
37.5
37.7
37.5
37.7
37.5
37.7
37.7

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
0.0
2.5
33.3
8.0
203
0.0
2.7
1.3
1.3
1.3
0.0
0.0
0.0
4.4
1.3
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0 | AV (μ g g ⁻¹) 38.1 42.6 35.5 36.7 35.5 33.8 37.2 38.9 37.2 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 34.3 37.1 41.1 39.1 49.0 40.3 35.0 32.4 37.4 35.6 35.8 35.8 36.0

 | DIF
(µgg ⁻¹)
1.8
1.4
3.9
0.3
2.1
0.0
5.0
2.1
1.9
2.0
0.0
5.0
2.1
1.9
2.0
4.9
1.4
1.5
1.1
2.4
0.0
1.0
2.5
4.4
6.3
0.9
1.6
1.0
4.1
3.2
2.7
3.0
1.5
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
4.9
5.29
4.9
5.29
4.9
2.7
6.3
0.0
2.7
14.84
2.2
6
6.50
0.2
7.1
0.8
9
7.0
8.9
7.0
8.4
4.0
4.4
4.0
2.7
10.8
10.2
10.2
10.2
10.2
10.2
10.2
10.2
10.2 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mu\kappas^{-1})\\ 1.24\\ 1.72\\ 1.8\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.89\\ 0.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.68\\ 0.47\\ 0.68\\ 0$ | RSD
(%)
3.25
4.0
5.95
5.04
2.62
4.96
3.30
5.4
3.86
3.30
5.4
3.86
4.62
3.83
4.62
3.83
6.7
4.56
6.81
3.25
6.81
3.25
5.40
4.04
4.21
7.82
2.78
4.62
3.83
5.45
5.40
4.55
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5.40
5.85
5.40
5.85
5.85
5.85
5.85
5.85
5.85
5.85
5.8
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44
160
47
312
74 | DL (µ g g '') 0.003 0.082 0.001 0.034 0.002 0.118 0.003 0.063 0.003 0.003 0.005 0.063 0.002 0.013 0.035 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002
 | $\begin{array}{c} \hline AV \\ (\mu_{g}e^{-1}) \\ 39.7 \\ 40.1 \\ 41.3 \\ 39.2 \\ 39.8 \\ 37.0 \\ 40.8 \\ 41.6 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 37.2 \\ 36.8 \\ 37.2 \\ 37.2 \\ 37.2 \\ 36.8 \\ 141.1 \\ 43.6 \\ 43.5 \\ 39.1 \\ 47.9 \\ 39.8 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.3 \\ 35.2 \\ 39.3 \\ 35.2 \\ 35$
 | DIF
(<u>µgg</u> ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.7
4.9
4.4
5.2
0.7
4.9
5.2
2.0
0.2
0.2
0.2
0.2
5.5
2.1
1.5
0.2
0.2
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0.2
5.5
2.8
1.1
1.5
0.2
0.2
0.2
5.5
2.8
1.1
1.5
0.2
0.2
5.5
2.8
1.1
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1.5
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0.2
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1.5
1.5
2.0
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0.2
5.5
2.8
1.1
1.5
2.0
0.2
5.5
2.8
1.1
1.5
2.0
0.2
0.2
5.5
2.8
1.5
1.5
0.9
0.2
5.5
2.2
0.9
0.2
5.5
2.8
1.5
1.5
1.5
0.9
0.2
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1.5
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0.2
2.2
0.0
0.2
0.2
0.2
0.2
0.2
0.0
0.2
0.2 | $\begin{array}{c} 10 \ \mu m \\ DIF\% \\ (\%) \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 10.4 \\ 10.15 \\ 10.4 \\ 4.3 \\ 17.25 \\ 1.9 \\ 2.3 \\ 0.5 \\ 5.7 \\ 16.5 \\ 12.6 \\ 12.27 \\ 1.2 \\ 0.2 \\ 0.2 \\ 0.9 \\ 4.2 \\ 0.9 \\ 4.2 \\ 0.9 \\ 1.4 \\ 5.8 \\ 5.0 \\ 0.9 \end{array}$ | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mu_{EE}^{-1} \right) \\ 2.35 \\ 4.38
\\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 4.57 \\ 2.23 \\ 4.57 \\ 1.22 \\ 4.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 2.13 \\ 1.08 \\ 2.13 \\ 1.08 \\ 2.13 \\ 1.08 \\ 2.13 \\ 1.08 \\ 2.13 \\ 1.08 \\ 2.13 \\ 1.08 \\ 2.13 \\ 1.08 \\ 2.15 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.87 \\ 0.77 \\ 1.31 \\ 1.31 \\ \end{array}$ | RSD
(%)
5.91
10.9
3.70
11.57
3.31
13.95
5.43
12.55
4.67
5.32
2.81
6.26
6.26
6.21.4
3.31
5.91
6.26
6.26
6.21.4
4.33
1.57
5.91
6.26
8.83
3.65
8.83
4.01
5.31
2.17
5.31
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5.51
5.51
5.51
5 | Sensitivity
(cps/ <u>µ g g⁻¹)</u>
59
6
70
55
11
28
4
4
4
4
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4
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4
4
4
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4
5
5
59
84
106
55
91
15
3
28
34
106
55
91
15
3
28
34
102
14
118
119
144
22
81
25
168
39
9 | DL
(μεg ⁻¹)
0.004
0.005
0.078
0.005
0.048
0.003
0.008
0.133
0.004
0.033
0.114
0.003
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0.005
0.005 |
| Sc Ti V Cr Mn Co Ni Cu n Ga Ga Sb Sr Y Zr bhod Ch Sb Sa a ce Pr Nd m Li Gh bhod Sh Sb Sa a ce Pr Nd m Li Gh bhod bhod sh | RV (μ g g ⁻¹) 39.9 44 36.4 35.5 38.8 36.1 35.7 36.1 37.7 37.4 28.1 38.6 37.9 37.4 28.1 38.6 34.7 38.6 38.7 38.6 38.7 38.6 38.7 36.1 37.9 35.5 37.7 35.6 37.7 35.5 37.7 37.6 37.6 38.3

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
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2.5
33.3
8.0
203
0.0
2.7
1.3
1.3
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1.3
0.0
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1.3
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2.7
1.3
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0.0
0 | AV (μ ε ε ⁻¹) 38.1 42.6 42.7 35.5 38.8 35.5 43.8 36.6 35.5 43.8 39.9 37.2 38.9 41.0 34.3 76.9 39.4 40.3 38.4 27.1 49.0 34.4 37.4 33.8 32.3 35.0 32.6 355.0 32.6 35.0 32.6 36.0 34.7

 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.6 \\ 1.0 \\ 1.0 \\ 1.5 \\ 1.6 \\ 1.5 \\ 1.5 \\ 1.6 \\ 1.5 \\ 1.6 \\ 1.5 \\ 1.6 \\ 1.5 \\
1.5 \\ 1.5 \\$ | 20 µm
DIF%
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18.84 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mueg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.60\\ 1.29\\ 1.12\\ 1.12\\ 1.82\\ 1.$ | RSD
(%)
3.25
5.04
2.62
4.96
5.04
3.30
5.4
4.96
2.45
2.83
2.78
4.62
2.83
2.78
4.62
2.83
3.27
8.46
6.81
3.25
5.40
4.04
2.10
1.31
3.25
5.40
2.25
2.40
4.04
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3.25
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4.05
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5.54
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5.54
5.54
5
 | Sensitivity
(cps/ µg g ⁻¹)
114
6
101
11
132
99
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44
160
47
312
74
308 | DL (µ g g (1)) (µ g (1)) 0.003 0.002 0.001 0.002 0.002 0.002 0.002 0.018 0.002 0.013 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.004 0.001 0.004 0.001
 | $\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.6 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,0 \\ 40.6 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 41.1 \\ 43,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 42,8 \\ 43,5 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 35,1 \\ 35,2 \\ 35,7 \\ 35,2 \\ 35,7 \\ 35,2 \\ 35,7 \\ 35,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 35,3 \\ 35,1 \\ 35,2 \\ 35,7 \\ 35,2 \\ 36,2 \\ 36,2 \\ 35,7 \\ 35,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 35,7 \\ 35,2 \\ 35,7 \\ 35,2 \\ 36,2 \\ 36,2 \\ 35,7 \\ 35,2 \\ 36,2 \\ 36,2 \\ 35,7 \\ 35,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 35,7 \\ 35,2 \\ 35,7 \\ 35,2 \\ 36,2 \\ 35,7 \\ 35,2 \\ 36,2 \\ 35,7 \\ 35,2 \\ 36,2 \\ 35,7 \\ 35,2 \\ 35,2 \\ 35,2 \\ 35,2 \\ 35,2 \\ 35,2 \\ 35,2 \\ 35,2 \\ 35,2 \\ 35,2$
 | $\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 1.9 \\ 0.3 \\ 2.1 \\ \end{array}$ | 10 μm DIF% (%) 0.5 9.0 0.5 9.0 6.6 7.6 2.8 4.1 5.1 16.3 110.4 4.3 1.9 2.3 0.5 5.7 1.6.5 2.4 12.6 12.2 3.5 2.2 0.9 4.2 1.5 1.6.5 2.4 12.6 12.2 3.5 2.2 0.9 4.2 1.8 5.0 0.9 5.6 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1} \right) \\ \left(2.35 \\ 4.38 \\ 2.10 \\
1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 2.31 \\ 3.09 \\ 2.62 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.41 \\ 1.87 \\ 0.77 \\ 1.31 \\ 2.44 \\ \end{array}$ | RSD
(%)
5.91
10.9
5.08
3.70
5.81
3.33
12.55
5.43
13.95
5.43
13.95
5.43
13.33
12.55
5.43
13.33
5.81
4.67
5.22
2.81
5.09
2.63
6.26
2.14
3.31
6.44
4.20
6.59
4.44
4.20
5.65
5.65
5.65
3.65
9.444
4.20
5.65
9.444
4.20
5.65
9.65
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8.83
4.01
5.31
5.65
8.83
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8.65
8.65
8 | Sensitivity
(ops/ µg g ⁻¹)
59
6
70
55
11
28
4
15
5
59
84
15
55
84
15
55
84
15
55
91
15
3
28
34
102
14
118
119
144
26
22
81
22
81
25
168
39
160 | DL
(µ g g -1)
0.004
0.180
0.005
0.078
0.003
0.004
0.003
0.004
0.033
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| Sc Ti V Cr M no Ni u C n a c A Rb Sr Y Zr Nb o d Sn b s sa a c e rr d m su d b b y Hor | RV
(<u>µgg⁻¹)</u>
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38.8
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 | BG
(cps)
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11.1
22.2
47.8
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141
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0 | AV (μ ε ε ⁻¹) 38.1 42.6 35.5 36.7 35.5 37.2 38.9 37.2 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 34.3 37.1 41.1 39.1 49.0 40.3 35.0 32.8 35.0 32.8 35.8 35.8 36.0 34.4 35.8 35.8 36.0 34.4 35.8 36.0 34.4 35.8 36.0 34.0 34.0 34.0 34.0 34.0

 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \\ 1.0 \\ 2.5 \\ 4.4 \\ 6.3 \\ 0.9 \\ 1.6 \\ 1.0 \\ 2.5 \\ 4.4 \\ 6.3 \\ 0.9 \\ 1.6 \\ 1.0 \\ 2.5 \\ 1.6 \\ 1.5 \\ 3.6
\\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 1.5 \\ 3.6 \\ 1.5 \\ 1.$ | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.9
5.29
4.9
5.29
4.9
3.6
4.03
1.9
2.7
6.3
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7.0
7.0
7 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mu\kappas^{-1})\\ 1.24\\ 1.72\\ 1.8\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.12\\ 1.88\\ 1.12\\ 1.88\\ 1.12\\ 1.88\\ 1.12\\ 1.80\\ 1.42\\ 1.80\\ 1.42\\ 1.80\\ 1.42\\ 1.87\\ 2.66\\ 1.89\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.47\\ 0.68\\ 0.48\\ 0.47\\ 0.68\\ 0.48\\ 0.47\\ 0.68\\ 0.48\\ 0.48\\ 0.47\\ 0.68\\ 0.48\\ 0$ | RSD
(%)
3.25
4.0
5.95
5.04
2.62
4.96
3.30
5.4
3.86
3.54
3.86
4.62
3.83
4.62
3.83
6.7
4.56
6.81
3.25
5.40
4.62
3.83
6.7
4.56
6.81
3.25
5.40
4.04
2.10
1.31
3.29
2.02
2.02
2.02
2.02
2.02
2.02
2.02
2
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44
160
47
312
74
308 | DL (µ g g '') 0.003 0.082 0.001 0.034 0.002 0.118 0.005 0.663 0.001 0.035 0.063 0.002 0.013 0.035 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.003 0.003 0.005
 | $\begin{array}{c} \hline AV \\ (\mu_{g}e^{-1}) \\ 39.7 \\ 40.1 \\ 41.3 \\ 39.2 \\ 39.8 \\ 37.0 \\ 40.8 \\ 41.6 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 37.2 \\ 36.8 \\ 37.2 \\ 37.2 \\ 36.8 \\ 141.1 \\ 43.6 \\ 43.5 \\ 39.1 \\ 47.9 \\ 39.8 \\ 39.1 \\ 47.9 \\ 39.8 \\ 39.1 \\ 47.9 \\ 39.2 \\ 39.3 \\ 35.2 \\ 39.3 \\ 35.2 \\ 35$
 | DIF
(<u>µgg</u> ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.7
4.9
4.4
5.2
0.7
4.9
4.4
5.2
0.2
2.2
6.2
0.7
1.2
0.2
0.2
5.5
2.2
8
1.1
1.5
0.2
0.2
5.5
2.5
2.5
2.5
2.5
2.5
2.5
2.5
2.5
2 | 10 μm DIF% (%) 0.5 9.0 0.5 9.0 0.5 9.0 6.6 7.6 10.15 11.0 1.3 17.25 5.7 16.5 12.6 12.27 1.2 2.3 2.2 0.9 4.2 5.8 5.0 5.8 5.0 5.8 5.0 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu_{EE}^{-1})\\ 2.35\\ 4.38\\ 2.10\\ 1.45\\
4.60\\ 1.22\\ 2.37\\ 1.69\\ 4.57\\ 2.23\\ 4.57\\ 2.23\\ 4.57\\ 1.72\\ 4.57\\ 1.72\\ 4.09\\ 1.05\\ 1.94\\ 1.08\\ 2.73\\ 1.65\\ 1.94\\ 1.08\\ 2.13\\ 1.65\\ 1.65\\ 1.65\\ 1.65\\ 1.65\\ 1.29\\ 3.47\\ 1.41\\ 1.87\\ 0.77\\ 1.31\\ 2.44\\ 4.57\\ 0.73\\ 1.31\\ 2.44\\ 4.57\\ 0.73\\ 1.31\\ 2.44\\ 4.57\\ 0.75\\ 0.73\\ 1.31\\ 2.45\\ 1.55\\ 0.75\\ $ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
13.95
5.43
12.55
5.43
12.55
5.43
2.81
4.67
5.32
2.81
5.91
6.26
6.26
6.26
6.21
4.44
4.20
5.65
8.83
3.65
8.83
4.01
5.31
2.17
6.36
5.31
2.17
6.36
5.31
5.31
5.31
5.31
5.32
2.81
6.26
6.30
6.26
6.30
6.30
6.30
6.30
6.30
6.30
6.30
6.3 | Sensitivity
(cps/ µgg')
59
6
70
55
55
11
28
4
8
4
8
15
5
59
84
106
55
91
15
3
8
4
102
15
3
3
8
4
102
14
118
119
144
22
81
25
5
168
39
160
5; | DL
(μεg ⁻¹)
0.004
0.005
0.078
0.005
0.048
0.003
0.008
0.133
0.004
0.033
0.114
0.003
0.004
0.004
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0.002 |
| Sc Ti V Cr M c Ni U n a g G s Kb r Y Zr b M c d n Sb s a a c Pr N m U d f b y h c r | RV (μgg ⁻¹) 39.9 44 36.4 35.5 38.8 36.1 35.7 36.1 37.7 37.4 28.1 38.6 37.9 37.4 28.1 38.6 34.7 38.7 38.8 37.9 38.6 38.7 38.6 38.7 36.1 37.9 35.5 37.7 35.6 37.7 35.6 37.7 35.6 37.7 35.6 37.6 38.3 38.3

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
2.5
33.3
8.0
203
0.0
2.7
1.3
1.3
2.7
1.3
0.0
0.0
2.7
1.3
1.3
0.0
0.0
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2.7
1.3
0.0
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0.0
0 | $\begin{array}{c} {\color{black} {\color{blacl} {\color{blacl} {\color{blacl} {\color{blacl} {\color{blacl} {\color{blacl} {\color{blacl}$

 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.6 \\ 1.0 $ | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.0.11
12.77
5.53
4.9
5.29
13.6
4.03
2.7
6.3
0.0
2.7
3.6
6.3
0.0,27
3.6
6.3
0.0,27
3.6
0.12,7
14.84
4.27
4.6
8.9
10.2
8.4
4.6
4.37
1.27
8.4
4.6
4.37
1.27
8.4
8.9
7.0
8.4
8.4
8.4
8.4
8.4
8.4
8.4
8.4
8.4
8.4
 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mueg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.60\\ 1.32\\ 1.88\\ 1.12\\ 1.12\\ 1.82\\ 1.$ | RSD
(%)
3.25
4.0
5.95
5.04
2.62
4.96
5.4
4.96
2.43
2.83
2.78
4.62
2.83
2.78
4.62
2.83
2.78
4.62
2.83
2.78
4.62
4.96
2.83
3.75
5.40
4.96
2.83
3.75
5.40
4.96
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3.70
4.96
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3.75
5.74
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2.78
4.96
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3.25
5.74
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3.25
4.27
4.56
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3.25
5.74
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4.25
2.83
3.25
2.78
4.25
2.78
2.78
2.78
2.78
2.78
2.78
2.78
2.78 | Sensitivity
(cps/ µg g ⁻¹)
114
6
101
11
132
99
48
7
8
9
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44
160
47
312
74
308
102 | DL (µ g g '') 0.003 0.082 0.001 0.334 0.002 0.018 0.002 0.018 0.002 0.013 0.002 0.013 0.002 0.001 0.002 0.001 0.002 0.001 0.004 0.001 0.004 0.001 0.003 0.001

 | $\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ (\mu \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.6 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 42,8 \\ 43,5 \\ 39,1 \\ 47,9 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 35,2 \\ 35,7 \\ 35,2 \\ 35,7 \\ 35,2 \\ 35,7 \\ 35,2 \\ 35,7 \\ 35,2 \\ 36,2 \\$
 | $\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 0.3 \\ 2.1 \\ 0.0 \\ r \end{array}$ | 10 μm DIF% 0.5 9.0 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 1.9 2.3 0.5 5.7 1.4 2.3 0.5 2.4 12.6 12.27 1.2 2.3 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 5.6 0.0 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.57 \\ 2.23 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.99 \\ 1.05 \\ 1.99 \\ 1.05 \\ 1.94 \\ 1.08 \\ 2.31 \\ 3.09 \\ 2.62 \\ 1.65 \\$ | RSD
(%)
5.91
10.9
5.08
3.700
5.81
3.331
5.81
13.95
5.43
13.95
5.43
13.33
5.43
12.55
5.43
13.33
5.43
12.55
5.43
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13.33
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12.55
5.43
13.33
5.44
4.67
5.32
4.67
5.44
4.44
4.20
5.65
5.65
5.65
5.65
5.65
5.65
5.65
5.6
 | Sensitivity
(ops/ µg g ⁻¹)
59
6
70
55
11
28
4
15
5
59
84
15
55
84
15
55
84
15
55
84
15
55
91
15
3
28
34
102
14
118
119
144
26
22
81
25
168
39
160
51 | DL
(µ g g -1)
0.004
0.180
0.005
0.078
0.003
0.005
0.048
0.003
0.004
0.033
0.004
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| Sc Ti V Cr M no Ni Cu n a ce A kb Sr Y Zr Nb o cd Sn b s sa a ce Pr bd Sm Li dd Tb y he r m | RV
(<u>µgg⁻¹)</u>
39.9
44
38.8
36.4
35.5
38.8
37.8
39.1
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35.7
31.4
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 | BG
(cps)
227
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22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
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0.0
2.5
33.3
8.0
203
0.0
2.7
1.3
1.3
2.7
1.3
1.3
0.0
0.0
0.2
5
33.3
8.0
203
0.0
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2.7 | AV (μ ε g ⁻¹) 38.1 42.6 35.5 33.8 35.5 33.8 37.2 38.9 37.2 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 38.9 35.0 32.6 355.8 36.0 34.7 36.4 36.7

 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \\ 1.0 \\ 1.5 \\ 1.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ \end{array}$
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.0
3.4
3.4
3.4
3.4
3.7
6.3
0.2
7
14.84
2.2
6.50
0.7
14.84
2.2
6.50
8.9
7.0
8.8
9
7.0
8.8
9
7.0
8.4
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7 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mu\kappas^{-1})\\ 1.24\\ 1.72\\ 1.8\\ 1.84\\ 0.93\\ 2.17\\ 2.18\\ 1.82\\ 1.2\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.12\\ 1.88\\ 1.12\\ 1.88\\ 1.12\\ 1.80\\ 1.47\\ 1.88\\ 1.12\\ 1.87\\ 2.66\\ 1.89\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.88\\ 0.77\\ 1.18\\ \end{array}$ | RSD
(%)
3.25
4.0
5.95
5.04
2.62
4.96
5.04
2.62
4.96
5.4
3.30
5.4
3.30
5.4
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5.4
4.62
3.83
4.62
4.83
4.62
3.83
6.7
4.56
6.81
3.25
5.40
4.04
4.04
4.05
5.55
5.40
4.05
4.05
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44
160
47
312
74
308
102
306 | DL (µ g g '') 0.003 0.082 0.001 0.034 0.002 0.118 0.005 0.663 0.002 0.113 0.035 0.002 0.013 0.035 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.003 0.001 0.001 0.001
 | $\begin{array}{c} \hline AV \\ (\mu_{g}e^{-1}) \\ 39.7 \\ 40.1 \\ 41.3 \\ 39.2 \\ 39.8 \\ 37.0 \\ 40.8 \\ 41.6 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 41.0 \\ 32.7 \\ 31.2 \\ 32.7 \\ 37.2 \\ 36.1 \\ 37.2 \\ 37.2 \\ 38.1 \\ 41.1 \\ 43.6 \\ 38.1 \\ 41.1 \\ 43.6 \\ 38.1 \\ 37.2 \\ 39.3 \\ 37.2 \\ 39.2 \\ 39.3 \\ 35.2 \\ 39.3 \\ 35.2 \\ 39.3 \\ 35.2 \\ 35.$
 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 1.5 \\ 5.4 \\ 1.5 \\ 5.4 \\ 1.5 \\ 5.4 \\ 1.5 \\ 0.9 \\ 0.2 \\ 2.2 \\ 6.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 1.2 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 1.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 0.6 \\ \end{array}$ | $\begin{array}{c} 10 \ \mu m \\ DIF\% \\ (\%) \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 9.0 \\ 0.5 \\ 10.1 \\ 10.15 \\ 10.4 \\ 4.3 \\ 17.25 \\ 1.9 \\ 2.3 \\ 10.4 \\ 4.3 \\ 17.25 \\ 1.9 \\ 2.3 \\ 5.7 \\ 12.6 \\ 12.27 \\ 1.2 \\ 0.2 \\ 0.9 \\ 4.2 \\ 0.9 \\ 4.2 \\ 0.9 \\ 4.5 \\ 0.9 \\ 5.6 \\ 0.0 \\ 1.6 \\ \end{array}$ | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mu_{EE}^{-1}
\right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 4.57 \\ 2.23 \\ 4.57 \\ 1.22 \\ 4.67 \\ 1.72 \\ 4.09 \\ 1.08 \\ 2.73 \\ 1.87 \\ 1.08 \\ 2.73 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.29 \\ 3.47 \\ 1.44 \\ 2.31 \\ 1.87 \\ 0.77 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ \end{array}$ | RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
13.95
5.43
12.55
4.67
5.32
2.81
6.26
6.26
6.26
6.26
6.21.4
3.31
5.91
6.26
5.91
6.26
6.26
6.21.4
4.20
5.63
1.2.55
8.83
3.65
8.83
3.65
8.83
3.71
6.75
4.83
3.71 | $\begin{array}{c} \text{Sensitivity} \\ (\text{cps} / \mu g g^{-1}) \\ 59 \\ 59 \\ 59 \\ 6 \\ 70 \\ 55 \\ 11 \\ 28 \\ 4 \\ 15 \\ 55 \\ 91 \\ 15 \\ 55 \\ 91 \\ 15 \\ 32 \\ 34 \\ 102 \\ 14 \\ 118 \\ 119 \\ 144 \\ 26 \\ 22 \\ 81 \\ 125 \\ 168 \\ 39 \\ 160 \\ 51 \\ 163 \\ \end{array}$ | $\begin{array}{c} {\color{black} {\color{blacl} {\color{blacl} {\color{blacl} {\color{blacl} {\color{blacl} {\color{blacl} {\color{blacl}$ |
| Sc Ti V Cr M Co Ni Cu Zn a de s b Sr Y Zr Nb to Cd Sn bb Sc sa a ce Pr Nd m Li Gd bb Yo Fr Tyb | RV (μgg ⁻¹) 39.9 44 36.4 35.5 38.8 36.1 35.7.8 39.1 36.1 35.7.8 36.1 35.7.8 36.1 37.9 37.4 28.1 38.6 34.7 38.6 38.7 38.6 38.7 38.6 38.7 36.1 37.9 35.5 37.7 36.3 37.9 35.5 37.7 35.6 37.7 35.5 38.3 38.3 38.3 38.3 38.3 38.3 38.3 38.3 38.3 38.3 38.3 39.2 <td>BG
(cps)
227
11.1
22.2
47.8
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141
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33.3
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14.7
76
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0</td> <td>$\begin{array}{c} {\color{black} {\color{blacl} {\color{blacl} {\color{blacl} {\color{blacl} {\color{blacl} {\color{blacl} {\color{blacl}$</td> <td>$\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.6 \\ 1.0 \\$</td> <td>20 µm
DIF%
(%)
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0.0.11
12.77
5.53
4.9
5.29
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7
7</td> <td>$\begin{array}{c} \text{SD} (1\sigma)\\ (\mueg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.66\\ 1.88\\ 1.12\\ 1.12\\ 1.82\\
1.82\\ 1.$</td> <td>RSD
(%)
3.25
4.0
5.95
5.04
2.62
4.96
5.4
4.96
2.43
2.83
2.78
4.62
2.83
2.78
4.62
2.83
3.27
8.46
2.43
3.75
1.66
6.81
3.25
5.40
4.04
2.10
1.31
3.25
5.40
2.02
4.04
4.04
2.10
2.55
5.40
2.51
2.51
2.51
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2.51
2.51
2.51
2.51</td> <td>Sensitivity
(cps/ µg g⁻¹)
114
6
101
11
132
99
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44
160
47
312
74
308
102
306
67</td> <td>DL (µ g g (1)) (µ g g (1)) 0.003 0.082 0.001 0.334 0.002 0.018 0.002 0.018 0.002 0.013 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.004 0.001 0.004 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.003 0.002 0.001</td> <td>$\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ (\eta \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.6 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 43.1 \\ 41.1 \\ 41.1 \\ 42.8 \\ 43.5 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 35,2 \\ 35,3 \\ 35,1 \\ 35,2 \\ 35,7 \\ 35,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\$</td> <td>$\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.4 \\ 5.2 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 0.3 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \end{array}$</td> <td>10 μm DIF% 0.5 9.0 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 1.9 2.3 0.5 5.7 1.6.5 2.4 12.6 12.27 3.5 2.2 0.9 4.2 1.5.0 0.2 0.9 4.2 1.4.4 5.0 0.2 0.2 0.2 0.2 0.2 0.2 5.6 0.0 1.6 5.6 0.7 5.6 0.6 6.6</td> <td>$\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 2.31 \\ 3.09 \\ 2.62 \\ 1.65 \\ 1.61 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \end{array}$</td> <td>RSD
(%)
5.91
10.9
5.08
3.70
5.81
3.33
11.55
5.43
13.95
5.43
12.55
5.43
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118
119
144
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168
39
163
36</td> <td>DL
(µ g g
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 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.6 \\ 1.0 \\$ | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.0.11
12.77
5.53
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5.29
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7 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mueg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.66\\ 1.88\\ 1.12\\ 1.12\\ 1.82\\
1.82\\ 1.$ | RSD
(%)
3.25
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2.62
4.96
5.4
4.96
2.43
2.83
2.78
4.62
2.83
2.78
4.62
2.83
3.27
8.46
2.43
3.75
1.66
6.81
3.25
5.40
4.04
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(cps/ µg g ⁻¹)
114
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101
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189
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234
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293
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44
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74
308
102
306
67 | DL (µ g g (1)) (µ g g (1)) 0.003 0.082 0.001 0.334 0.002 0.018 0.002 0.018 0.002 0.013 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.004 0.001 0.004 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.003 0.002 0.001

 | $\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ (\eta \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.6 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 43.1 \\ 41.1 \\ 41.1 \\ 42.8 \\ 43.5 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 39,1 \\ 35,2 \\ 35,3 \\ 35,1 \\ 35,2 \\ 35,7 \\ 35,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\ 35,2 \\ 36,2 \\ 36,2 \\$ | $\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.4 \\ 5.2 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 0.3 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \end{array}$
 | 10 μm DIF% 0.5 9.0 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 1.9 2.3 0.5 5.7 1.6.5 2.4 12.6 12.27 3.5 2.2 0.9 4.2 1.5.0 0.2 0.9 4.2 1.4.4 5.0 0.2 0.2 0.2 0.2 0.2 0.2 5.6 0.0 1.6 5.6 0.7 5.6 0.6 6.6 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 2.31 \\ 3.09 \\ 2.62 \\ 1.65 \\ 1.61 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \end{array}$ | RSD
(%)
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17 | Sensitivity
(ops/ µg g ⁻¹
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28
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106
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91
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102
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118
119
144
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81
22
51
168
39
163
36 | DL
(µ g g -1)
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0.180
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0.078
0.003
0.005
0.048
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0.002 |
| Sc Ti V Cr M co Ni u C n a e s k Sr Y Zr b o d n b s s a a ce rr d m u d b y o r rm b u | RV
(<u>µgg⁻¹)</u>
39.9
44
38.8
36.4
35.5
38.8
37.8
39.1
36.1
35.7
31.4
78.4
38.9
37.4
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37.3

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
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2.7 | AV (μ ε g ⁻¹) 38.1 42.6 35.5 33.8 37.2 38.9 37.2 38.9 37.2 38.9 37.2 38.9 37.1 41.1 39.1 49.0 40.3 38.9 38.4 37.4 35.0 32.6 355.8 36.4 36.7 38.4.0 34.7 36.4 36.7 38.3

 | $\begin{array}{c} \text{DJF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \\ 1.0 \\ 1.5 \\ 1.6 \\ 1.0 \\ 4.1 \\ 3.2 \\ 2.7 \\ 3.0 \\ 1.5 \\ 1.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.7
\\ 1.7 \\$ | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.53
4.0
3.4
3.4
3.4
3.7
5.29
13.6
4.03
2.7
3.6
6.50
0.2.7
14.84
2.2
6.3
0.0
2.7
14.84
2.2
6.3
0.0
2.7
14.84
2.2
0.8,9
7.0
8.9
7.0
8.4
4.4
2.2
0.8
8.9
7.0
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12.7
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12.7 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mu\kappa\sigma^{-1})\\ 1.24\\ 1.72\\ 1.8\\ 1.84\\ 0.93\\ 2.17\\ 2.18\\ 1.82\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.12\\ 1.80\\ 1.42\\ 1.80\\ 1.42\\ 1.80\\ 1.42\\ 1.87\\ 2.66\\ 1.89\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.88\\ 0.77\\ 1.18\\ 2.00\\ 1.28\\ 0.68\\ 0.88\\ 0.71\\ 1.18\\ 2.00\\ 1.28\\ 0.68\\ 0.88\\ 0.71\\ 1.18\\ 2.00\\ 0.28\\ 0.128\\ 0.88\\ 0.71\\ 1.18\\ 2.00\\ 0.28\\ 0.1$ | RSD
(%)
3.25
4.0
5.95
5.04
2.62
4.96
5.04
3.30
5.4
4.62
3.30
5.4
4.62
3.83
4.62
3.83
4.62
4.62
4.63
1.375
1.66
3.25
5.40
4.04
4.04
4.04
4.05
4.05
4.05
4.0
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44
160
47
312
74
308
102
306
67
314 | DL (µ g g '') 0.003 0.082 0.001 0.034 0.002 0.118 0.005 0.663 0.001 0.035 0.663 0.002 0.113 0.035 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.003 0.001 0.001 0.002 0.003 0.001 0.002
 | $\begin{array}{c} \hline {\bf AV} \\ \hline (\mu_{g}e^{-1}) \\ \hline 39.7 \\ \hline 40.1 \\ \hline 41.3 \\ \hline 39.2 \\ \hline 39.8 \\ \hline 37.0 \\ \hline 40.6 \\ \hline 41.6 \\ \hline 39.7 \\ \hline 41.0 \\ \hline 39.2 \\ \hline 37.2 \\ \hline 36.9 \\ \hline 37.2 \\ \hline 39.9 \\ \hline 37.2 \\ \hline 39.3 \\ \hline 37.2 \\ \hline 39.2 \\$
 | DIF
(<u>µgg</u> ⁻¹)
0.2
3.9
2.5
2.8
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2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5
5.4
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.7
4.9
4.4
5.2
0.7
4.9
2.1
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0.2
0.2 | 10 μm DIF% (%) 0.5 9.0 0.5 9.0 10.15 11.0 11.0 12.8 11.0 2.3 0.5 5.7 2.4 12.6 12.27 1.2 2.2 0.9 4.2 0.9 4.2 0.9 5.8 0.0 1.6 8.6 0.0 1.6 8.6 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mu_{EE}^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.45 \\ 4.57 \\ 2.23 \\ 4.57 \\ 2.23 \\ 4.57 \\ 1.22 \\ 4.57 \\ 1.22 \\ 4.99 \\ 1.08 \\ 2.73 \\ 1.44 \\ 2.31 \\ 3.09 \\ 2.62 \\ 1.65 \\ 1.65 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.87 \\ 0.77 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.54 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.24 \\ 1.34 \\ 3.24 \\ 1.34 \\ 3.26 \\ 1.55 \\ 1.29 \\ 3.47 \\ 1.31 \\ 1.34 \\ 3.24 \\ 1.34 \\ 3.26 \\ 1.54 \\ 1.34 \\ 3.26 \\ 1.55 \\ 1.29 \\ 3.47 \\ 1.31 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 1.34 \\ 3.26 \\ 1.34 \\ 3.26 \\ 1.34 \\ 1.34 \\ 3.26 \\ 1.34 \\ 1.34 \\ 3.26 \\ 1.34 \\ 1.34 \\ 3.26 \\ 1.34 \\ 1.34 \\ 3.26 \\ 1.34 \\ 1.34 \\ 3.26 \\ 1.34 \\ 1.34 \\ 3.26 \\ 1.34 \\ 1.34 \\ 3.26 \\ 1.34 \\ 1.34 \\ 3.26 \\ 1.34 \\ 1.34 \\ 1.34 \\ 3.26 \\ 1.34 \\ 1.34 \\ 1.34 \\ 3.26 \\ 1.34 \\ 1.34 \\ 1.34 \\ 3.26 \\ 1.34 \\ 1.3$ |
RSD
(%)
5.91
10.9
5.08
3.70
11.57
3.31
5.81
13.95
5.43
12.55
5.43
12.55
5.09
2.63
6.26
2.81
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5.5 | $\begin{array}{c} \text{Sensitivity} \\ (\text{cps} / \mu g g^{-1}) \\ 59 \\ 59 \\ 59 \\ 6 \\ 70 \\ 55 \\ 11 \\ 28 \\ 4 \\ 15 \\ 55 \\ 91 \\ 15 \\ 55 \\ 91 \\ 15 \\ 32 \\ 34 \\ 102 \\ 14 \\ 118 \\ 119 \\ 144 \\ 26 \\ 22 \\ 81 \\ 144 \\ 26 \\ 22 \\ 81 \\ 155 \\ 168 \\ 39 \\ 160 \\ 51 \\ 163 \\ 36 \\ 36 \\ 173 \\ \end{array}$ | DL (μ ε ε ε ⁻¹) 0.004 0.180 0.005 0.078 0.005 0.033 0.114 0.003 0.004 0.033 0.114 0.004 0.004 0.004 0.005 0.004 0.004 0.004 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.003 0.013 0.018 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 |
| Sc Ti V Cr M Co Ni Cu Zn a ce s b Sr Y Zr Nb o Cd Sn bb Sc sa a ce Pr Nd Sn u dd b y o Fr Th bb Luff | RV (μgg ⁻¹) 39.9 44 36.4 35.5 38.8 36.1 35.7 36.1 37.7 37.4 28.1 38.4 37.9 37.4 28.1 38.6 34.7 37.9 35.5 37.4 28.1 38.6 34.7 36.3 37.9 35.5 37.7 35.6 37.7 35.5 38.3 38.4 37.6 35.5 38.3 38.8 36.8 38.3 38.3 38.3 38.3 38.3 38.3 38.3 38.3 38.3 38.3 38.9

 | BG
(cps)
227
11.1
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2.7 | AV (μ ε ε ⁻¹) 38.1 42.6 42.7 35.5 38.9 37.2 38.9 31.0 34.3 76.9 39.4 40.3 38.9 40.3 38.9 40.3 38.9 40.3 38.9 40.3 38.9 40.3 38.9 40.3 38.9 40.3 38.4 27.1 49.0 34.4 37.1 39.1 49.0 34.4 35.0 32.6 35.0 32.6 35.0 32.6 36.4 36.4 36.4 36.4 36.4 36.4 36.4 36.4 <td>$\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.6 \\ 1.0 \\ 1.0 \\ 1.5 \\ 3.6 \\ 1.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.5
\\ 1.5 \\ 1.5$</td> <td>20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
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12.77
5.53
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5.29
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7
14.84
4.27
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14.84
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5</td> <td>$\begin{array}{c} \text{SD} (1\sigma)\\ (\mueg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.66\\ 1.88\\ 1.12\\ 1.12\\ 1.82\\ 1.$</td> <td>RSD
(%)
3.25
4.0
5.95
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2.62
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2.43
2.83
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4.96
2.83
3.75
1.66
6.81
3.25
5.40
4.04
2.10
1.31
3.25
5.54
2.02
4.96
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2.0</td> <td>Sensitivity
(cps/ µg g⁻¹)
114
6
101
11
132
99
48
7
8
9
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44
160
47
312
74
306
67
314
96</td> <td>DL (µ g g (1)) (µ g g (1)) 0.003 0.082 0.001 0.334 0.002 0.018 0.002 0.018 0.002 0.013 0.002 0.001 0.002 0.001 0.001 0.002 0.001 0.004 0.001 0.004 0.001 0.002 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.001 0.002 0.001 0.002 <t< td=""><td>$\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.6 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 43.8 \\ 43.5 \\ 39,1 \\ 47.9 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 37.2 \\ 39,2 \\ 39,1 \\ 35.2 \\ 35.7 \\ 35.2 \\ 36.0 \\ 35.7 \\ 35.2 \\ 36.2 \\ 36.2 \\ 36.2 \\ 37.9$</td><td>$\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 0.3 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \\ 3.4 \\ 0.5 \end{array}$</td><td>10 μm DIF% 0.5 9.0 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 1.9 2.3 0.5 5.7 12.6 12.27 1.2 2.3 0.5 2.4 12.6 12.6 12.27 1.2 1.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.4 1.4 5.8 0.0 1.6 0.3 0.4 1.4 5.8 0.9 1.5 </td><td>$\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1} \right) \\ \left(2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.57 \\ 2.23 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.22 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.99 \\ 1.05 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.85 \\ 1.29 \\ 3.47 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.14 \\ 2.9 \\ 2.9 \\ 2.9 \\ 1.5 \\ 1.29 \\ 3.47 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.14 \\ 2.9 \\ 2.9 \\ 1.9
\\ 1.9 \\ 1.9$</td><td>RSD
(%)
5.91
10.9
5.08
3.700
5.81
3.331
5.81
11.57
3.331
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15.71
15.715</td><td>Sensitivity
(ops/ µg g⁻¹)
59
6
70
55
11
28
4
15
5
59
84
15
55
84
15
55
84
15
55
91
15
3
28
34
102
14
118
119
144
26
22
81
25
168
39
163
36
51
163
36
51
51</td><td>DL (µ g g e^{-1}) 0.004 0.180 0.005 0.078 0.005 0.043 0.003 0.033 0.044 0.033 0.044 0.033 0.004 0.003 0.004 0.005 0.006 0.002 0.014 0.147 0.006 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.003 0.004 0.005 0.002 0.003 0.004 0.005 0.002 0.003 0.004 0.005 0.002 0.008 0.002 0.002 0.003 0.004 </td></t<></td> | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.6 \\ 1.0 \\ 1.0 \\ 1.5 \\ 3.6 \\ 1.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.5 \\
3.6 \\ 1.5 \\ 1.5 \\ 1.5 $ | 20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.0.11
12.77
5.53
4.9
5.29
13.6
4.03
7.9
6.3
0.0
2.7
3.6
6.3
0.0
2.7
3.6
6.3
0.0,2
7
14.84
4.27
4.6
8.9
7.0
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5 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mueg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.66\\ 1.88\\ 1.12\\ 1.12\\ 1.82\\ 1.$ | RSD
(%)
3.25
4.0
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5.54
2.02
4.96
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 | Sensitivity
(cps/ µg g ⁻¹)
114
6
101
11
132
99
48
7
8
9
27
10
114
156
189
97
173
30
7
55
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229
293
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44
160
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312
74
306
67
314
96 | DL (µ g g (1)) (µ g g (1)) 0.003 0.082 0.001 0.334 0.002 0.018 0.002 0.018 0.002 0.013 0.002 0.001 0.002 0.001 0.001 0.002 0.001 0.004 0.001 0.004 0.001 0.002 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.001 0.002 0.001 0.002 <t< td=""><td>$\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.6 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 43.8 \\ 43.5 \\ 39,1 \\ 47.9 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 37.2 \\ 39,2 \\ 39,1 \\ 35.2 \\ 35.7 \\ 35.2 \\ 36.0 \\ 35.7 \\ 35.2 \\ 36.2 \\ 36.2 \\ 36.2 \\ 37.9$</td><td>$\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 0.3 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \\ 3.4 \\ 0.5 \end{array}$</td><td>10 μm DIF% 0.5 9.0 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 1.9 2.3 0.5 5.7 12.6 12.27 1.2 2.3 0.5 2.4 12.6 12.6 12.27 1.2 1.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.4 1.4 5.8 0.0 1.6 0.3 0.4 1.4 5.8 0.9 1.5 </td><td>$\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1} \right) \\ \left(2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.57 \\ 2.23 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.22 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.99 \\ 1.05 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.85 \\ 1.29 \\ 3.47 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.14 \\ 2.9 \\ 2.9 \\ 2.9 \\ 1.5 \\ 1.29 \\ 3.47 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.14 \\ 2.9 \\ 2.9 \\ 1.9 \\
1.9$</td><td>RSD
(%)
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15.715</td><td>Sensitivity
(ops/ µg g⁻¹)
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102
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118
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168
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163
36
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36
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51</td><td>DL (µ g g e^{-1}) 0.004 0.180 0.005 0.078 0.005 0.043 0.003 0.033 0.044 0.033 0.044 0.033 0.004 0.003 0.004 0.005 0.006 0.002 0.014 0.147 0.006 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.003 0.004 0.005 0.002 0.003 0.004 0.005 0.002 0.003 0.004 0.005 0.002 0.008 0.002 0.002 0.003 0.004 </td></t<> | $\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.6 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 43.8 \\ 43.5 \\ 39,1 \\ 47.9 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 47.9 \\ 39,2 \\ 39,1 \\ 37.2 \\ 39,2 \\ 39,1 \\ 35.2 \\ 35.7 \\ 35.2 \\ 36.0 \\ 35.7 \\ 35.2 \\ 36.2 \\ 36.2 \\ 36.2 \\ 37.9$
 | $\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 0.3 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \\ 3.4 \\ 0.5 \end{array}$ | 10 μm DIF% 0.5 9.0 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 1.9 2.3 0.5 5.7 12.6 12.27 1.2 2.3 0.5 2.4 12.6 12.6 12.27 1.2 1.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.4 1.4 5.8 0.0 1.6 0.3 0.4 1.4 5.8 0.9 1.5
 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1} \right) \\ \left(2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.57 \\ 2.23 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.22 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.99 \\ 1.05 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.85 \\ 1.29 \\ 3.47 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.14 \\ 2.9 \\ 2.9 \\ 2.9 \\ 1.5 \\ 1.29 \\ 3.47 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.14 \\ 2.9 \\ 2.9 \\ 1.9$ | RSD
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51 | DL (µ g g e^{-1}) 0.004 0.180 0.005 0.078 0.005 0.043 0.003 0.033 0.044 0.033 0.044 0.033 0.004 0.003 0.004 0.005 0.006 0.002 0.014 0.147 0.006 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.003 0.004 0.005 0.002 0.003 0.004 0.005 0.002 0.003 0.004 0.005 0.002 0.008 0.002 0.002 0.003 0.004
 |
| Sc Ti V Cr M co Ni u n a a c A Rb Sr Y Z Nb o d Sn b s a a c Pr b M S E d Tb y b o r m b u H r | RV
(<u>µgg⁻¹)</u>
39.9
44
38.8
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141
113
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2.7 | AV (μ ε ε ⁻¹) 38.1 42.6 35.5 35.7 35.7 38.9 37.2 38.9 37.2 38.9 37.2 38.9 37.1 41.1 39.1 49.0 40.3 38.9 38.4 37.4 35.0 32.6 355.8 36.4 36.7 38.4.0 34.7 35.3 34.6

 | $\begin{array}{c} \text{DJF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \\ 1.0 \\ 2.5 \\ 4.4 \\ 1.6 \\ 1.0 \\ 1.0 \\ 2.5 \\ 4.4 \\ 1.5 \\ 1.6 \\ 1.6 \\ 1.5 \\ 3.6
\\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 1.5 \\ 3.6 \\ 1.5 \\ 1.5 \\ 1.5 \\ 3.6 \\ 1.5 \\$ | 20 µm
DIF%
(%)
4.6
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4.03
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2.2
6.50
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14.84
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8 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mu\kappa\sigma^{-1})\\ 1.24\\ 1.72\\ 1.8\\ 1.84\\ 0.93\\ 2.17\\ 2.18\\ 1.82\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.12\\ 1.80\\ 1.42\\ 1.80\\ 1.42\\ 1.80\\ 1.42\\ 1.80\\ 1.42\\ 1.80\\ 1.42\\ 1.89\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.88\\ 0.77\\ 1.18\\ 2.00\\ 1.12\\ 1$ | RSD
(%)
3.25
4.0
5.95
5.04
2.62
4.966
5.04
3.30
5.4
4.62
3.30
5.4
4.62
3.33
4.62
4.62
3.83
4.62
4.62
4.63
1.386
3.25
5.40
4.04
4.64
3.25
5.40
4.04
4.05
4.05
4.05
4.05
4.05
4.0
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44
160
47
312
74
308
102
306
67
314
96 | DL (µ g g '') 0.003 0.082 0.001 0.034 0.002 0.118 0.002 0.118 0.002 0.113 0.035 0.001 0.002 0.013 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.003 0.001 0.002 0.001 0.002 0.001 0.002
 | $\begin{array}{c} {\color{black} {\bf AV}}\\ \hline (\mu_{gg^{-1}})\\ 39.7\\ 40.1\\ 39.2\\ 39.8\\ 37.0\\ 40.8\\ 37.0\\ 40.8\\ 41.6\\ 32.7\\ 41.0\\ 39.9\\ 37.2\\ 36.8\\ 1.3\\ 41.1\\ 43.6\\ 8.8\\ 43.5\\ 39.9\\ 37.2\\ 39.3\\ 35.2\\ 39.3\\ 35.2\\ 39.3\\ 35.2\\ 39.3\\ 35.2\\ 39.3\\ 35.2\\ 39.3\\ 35.2\\ 39.3\\ 35.2\\ 39.3\\ 35.2\\ 39.3\\ 35.2\\ 35.2\\ 35.2\\ 36.2\\ 35.2\\ 36.2\\ 35.2\\ 36.2\\ 35.6\\ 36.2\\ 35.6\\ 35.6\\ 37.2\\ 35.6\\ 35.6\\ 37.2\\ 35.6\\ 35.6\\ 37.2\\ 35.6\\ 35.6\\ 37.2\\ 35.6\\ 35.6\\ 37.2\\ 35.6\\ 35.6\\ 37.2\\ 35.6\\ 35.6\\ 37.2\\ 37.2\\ 37.$
 | DIF
(<u>µgg</u> ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
1.5
5.4
1.5
5.4
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.7
4.9
4.4
5.2
0.7
4.9
4.4
5.2
0.7
0.3
1.6
0.2
2.2
0.7
4.9
2.5
5.4
1.5
1.5
0.2
2.2
6.2
0.2
0.2
5.5
2.6
0.2
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2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.45 \\ 4.57 \\ 2.23 \\ 4.57 \\ 2.23 \\ 4.57 \\ 1.22 \\ 4.57 \\ 1.22 \\ 4.09 \\ 1.08 \\ 2.73 \\ 1.44 \\ 2.31 \\ 3.09 \\ 2.62 \\ 1.65 \\ 1.65 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.87 \\ 0.77 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.54 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.55 \\ 1.29 \\ 3.47 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.57 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.57 \\ 1.31 \\ 1.34 \\ 3.26 \\ 1.57 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.57 \\ 1.31 \\ 1.34 \\ 3.26 \\ 1.57 \\ 1.31 \\ 1.34 \\ 3.26 \\ 1.57 \\ 1.31 \\ 1.34 \\ 3.26 \\ 1.57 \\ 1.31 \\ 1.34 \\ 3.26 \\ 1.57 \\ 1.31 \\ 1.34 \\ 3.26 \\ 1.57 \\ 1.31 \\ 1.34 \\ 3.26 \\ 1.57 \\ 1.31 \\ 1.34 \\ 3.26 \\ 1.57 \\ 1.5$ | RSD
(%)
5.91
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(cps/ µgg')
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144
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173
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55 | DL (μ ε ε ε -1) 0.004 0.180 0.005 0.078 0.005 0.033 0.114 0.003 0.004 0.033 0.114 0.004 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.003 0.018 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 |
| Sc Ti V Cr M Co Ni Cu Zn a de s b Sr Y Zr Nb o Cd Sn b Sc sa a ce Pr Nd Sn u dd b Yo Her Tm b Luff Ta | RV (μgg ⁻¹) 39.9 44 36.4 35.5 38.8 36.1 35.7 36.1 37.7 37.4 28.1 38.3 37.4 28.1 38.6 37.7 36.3 37.7 36.3 37.7 35.6 37.7 35.6 37.7 36.3 37.6 37.6 38.3 38.4 37.9 35.5 37.6 37.6 38.3 38.8 36.8 36.7 37.6 37.6 37.6 37.6 37.6

 | BG
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0 | $\begin{array}{c} {\bf AV}\\ (\mu \ {\bf g} \ {\bf g} \ {\bf g}^{-1})\\ 38.1\\ 42.6\\ 42.7\\ 36.6\\ 35.5\\ 43.8\\ 9.9\\ 37.2\\ 38.9\\ 41.0\\ 34.3\\ 76.9\\ 39.4\\ 40.3\\ 34.8\\ 76.9\\ 39.4\\ 40.3\\ 38.9\\ 40.3\\ 38.9\\ 40.3\\ 38.9\\ 40.3\\ 38.9\\ 40.3\\ 38.9\\ 40.3\\ 38.9\\ 40.3\\ 38.9\\ 40.3\\ 38.9\\ 40.3\\ 38.9\\ 40.3\\ 38.9\\ 40.3\\ 38.9\\ 40.3\\ 38.9\\ 40.3\\ 38.9\\ 40.3\\ 38.9\\ 40.3\\ 38.9\\ 38.4\\ 40.3\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 32.6\\ 35.0\\ 34.0\\ 34.0\\ 35.3\\ 34.6\\ 35.0\\ 34.0\\ 35.0\\ 34.0\\ 34.0\\ 35.0\\ 34.0\\ 34.0\\ 34.0\\ 35.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 34.0\\ 35.0\\ 34.0\\ 34.0\\ 34.0\\ 35.0\\ 34.0\\ 34.0\\ 34.0\\ 35.0\\ 34.0\\ 34.0\\ 34.0\\ 35.0\\ 34.0\\ 34.0\\ 34.0\\ 35.0\\ 34.0\\ 34.0\\ 34.0\\ 35.0\\ 34.0\\ $

 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.6 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.6 \\
1.6 \\ 1.6 $ | 20 µm
DIF%
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7,0000000000 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mueg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.47\\ 1.82\\ 1.87\\ 1.82\\ 1.89\\ 0.60\\ 1.29\\ 0.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.44\\ 0.68\\ 0.80\\ 0.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.48\\ 0.68\\ 0.88\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 0.88\\ 0.77\\ 1.13\\ 1.00\\ 1.20\\ 1.31\\ 1.00\\ 1.00\\ 1.20\\ 1.31\\ 1.00\\ 1.$ |
RSD
(%)
3.25
4.0
5.95
5.04
2.62
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2.83
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5.44
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2.83
3.27
5.40
4.94
4.62
2.83
3.27
5.40
2.10
1.149
3.75
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3.25
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3.219 | Sensitivity
(cps/ µg g ⁻¹)
114
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189
97
173
30
7
55
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234
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293
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312
74
306
67
314
96
332 | DL (µ g g (1)) (µ g g (1)) 0.003 0.082 0.001 0.334 0.002 0.018 0.002 0.018 0.002 0.013 0.002 0.001 0.002 0.003 0.001 0.002 0.001 0.002 0.001 0.004 0.001 0.004 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 <t< td=""><td>$\begin{array}{c} \hline {\sf AV} \\ \hline (\mu \ g \ g^{-1}) \\ (\eta \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.6 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 42.8 \\ 43.5 \\ 39,1 \\ 47.9 \\ 39,1 \\ 37,2 \\ 39,1 \\ 37,2 \\ 39,1 \\ 37,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 35,7 \\ 35,2 \\ 36,0 \\ 35,7 \\ 35,2 \\ 36,0 \\ 35,7 \\ 35,2 \\ 36,0 \\ 35,8 \\ 35,6 \\ 37,2 \\ 39,0 \\ \end{array}$</td><td>$\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \\ 3.4 \\ 0.5 \\ 1.4 \\ 0.5$</td><td>10 μm DIF% 0.5 9.0 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 1.2.3 0.5 5.7 2.4 12.6 12.27 3.5 2.2 0.9 4.2 1.5.0 0.2 0.9 4.2 1.4 5.0 0.9 4.2 1.4 5.0 0.9 5.6 0.0 1.6 5.0 0.9 5.6 0.0 1.6 3.7</td><td>$\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1} \right) \\ \left(2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.57 \\ 2.23 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.22 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 2.31 \\ 3.09 \\ 2.62 \\ 2.15 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.87 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 1.83 \\ 1.34 \\ 2.86 \\ 1.14 \\ 2.88 \\ 1.71 \\ 1.41 \\ 2.81 \\ 3.26 \\ 1.14 \\ 2.88 \\ 1.71 \\ 1.57 \\
1.57 \\ 1.5$</td><td>RSD
(%)
5.91
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5.08
3.700
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 | $\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \\ 3.4 \\ 0.5 \\ 1.4 \\ 0.5$ | 10 μm DIF% 0.5 9.0 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 1.2.3 0.5 5.7 2.4 12.6 12.27 3.5 2.2 0.9 4.2 1.5.0 0.2 0.9 4.2 1.4 5.0 0.9 4.2 1.4 5.0 0.9 5.6 0.0 1.6 5.0 0.9 5.6 0.0 1.6 3.7
 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1} \right) \\ \left(2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.57 \\ 2.23 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.22 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 2.31 \\ 3.09 \\ 2.62 \\ 2.15 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.87 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 1.83 \\ 1.34 \\ 2.86 \\ 1.14 \\ 2.88 \\ 1.71 \\ 1.41 \\ 2.81 \\ 3.26 \\ 1.14 \\ 2.88 \\ 1.71 \\ 1.57 \\ 1.5$ | RSD
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183 | DL
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| Sc Ti V Cr M co Ni cu n a ce s b Sr Y Z Nb o cd Sn b s sa a ce Pr b Se cd Tb y he r m b u Hf a W | RV (μ g g ⁻¹) 39.9 44 38.4 35.5 38.8 37.8 39.1 36.4 37.7 36.1 35.7 31.4 78.4 38.9 37.4 38.9 37.4 38.9 37.4 38.9 37.4 38.9 37.4 38.9 37.4 38.9 37.4 38.9 37.7 35.5 37.3 35.5 37.3 36.8 39.2 37.3 36.8 39.2 37.3 36.8 39.2 37.3 36.8 39.2 37.3 36.76 38

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22.2
47.8
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 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.0 \\ 1.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \\ 1.0 \\ 2.5 \\ 4.4 \\ 1.6 \\ 1.0 \\ 1.6 \\ 1.6 \\ 1.6 \\ 1.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.7 \\ 2.1 \\ 3.6 \\ 3.2 \\ \end{array}$
 | 20 µm
DIF%
(%)
4.6
3.1
10.2
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14.84
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7.0
8.8
9.31
10.2
2.0
8.4
4.0
2.7
10.8
8.9
7.0
8.4
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2.7
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7.0
8.4
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2.0
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10.7 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mu\kappa\sigma^{-1})\\ 1.24\\ 1.72\\ 1.8\\ 1.84\\ 0.93\\ 2.17\\ 2.18\\ 1.82\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 0.58\\ 1.12\\ 1.32\\ 1.32\\ 1.88\\ 1.12\\ 1.80\\ 1.47\\ 1.88\\ 1.12\\ 1.80\\ 1.47\\ 1.82\\ 1.89\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.62\\ 0.62\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 2.00\\ 1.28\\ 1.13\\ 1.00\\ 1.28\\ 1.13\\ 1.00\\ 1.28\\ 1.13\\ 1.00\\ 1.29\\ 0.62\\ 0.83\\ 0.77\\ 1.18\\ 2.00\\ 0.83\\ 0.77\\ 1.18\\ 2.00\\ 1.28\\ 1.13\\ 1.00\\ 1.28\\ 1.13\\ 1.00\\ 1.28\\ 1.33\\ 1.00\\ 1.29\\ 0.62\\ 0.83\\ 0.77\\ 1.18\\ 0.68\\ 0.83\\ 0.77\\ 1.18\\ 0.68\\ 0.83\\ 0.77\\ 1.18\\ 0.68\\ 0.83\\ 0.77\\ 1.18\\ 0.68\\ 0.83\\ 0.77\\ 1.18\\ 0.68\\ 0.83\\ 0.77\\ 1.18\\ 0.68\\ 0.83\\ 0.77\\ 1.18\\ 0.68\\ 0.83\\ 0.77\\ 1.18\\ 0.68\\ 0.83\\ 0.77\\ 1.18\\ 0.08\\ 0.83\\ 0.77\\ 1.18\\ 0.08\\ 0.83\\ 0.77\\ 1.18\\ 0.00\\ 0.28\\ 0.39\\ 0.00\\ 0.39\\ 0.00\\ 0$ | RSD
(%)
3.25
4.0
5.95
5.04
2.62
4.96
5.04
2.62
4.96
5.04
3.30
5.4
4.62
2.83
4.62
2.83
4.62
2.83
4.62
4.64
3.85
6.7
4.56
6.81
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6.81
3.85
5.40
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4.04
4.04
2.12
3.21
5.40
4.04
4.05
4.05
4.05
4.05
4.05
4.05
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44
160
176
25
234
229
293
50
44
160
176
25
234
229
300
67
312
74
308
67
314
96
332
266 | DL (µ g g '') 0.003 0.082 0.001 0.034 0.002 0.118 0.005 0.663 0.001 0.035 0.663 0.002 0.113 0.035 0.001 0.002 0.001 0.002 0.001 0.004 0.001 0.004 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.001 0.001 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001
 | $\begin{array}{c} \hline {\bf AV} \\ \hline (\mu_{gg^{-1}}) \\ \hline 39.7 \\ \hline 40.1 \\ \hline 39.7 \\ \hline 40.1 \\ \hline 39.2 \\ \hline 39.8 \\ \hline 37.0 \\ \hline 41.3 \\ \hline 39.7 \\ \hline 39.2 \\ \hline 37.2 \\ \hline 39.9 \\ \hline 37.2 \\ \hline 39.3 \\ \hline 35.2 \\ \hline 39.3 \\ \hline 35.2 \\ \hline 39.3 \\ \hline 35.2 \\$
 | DIF
(µgg ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
3.8
1.5
5.4
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.7
4.9
4.4
5.2
0.2
0.2
0.2
0.2
5.4
1.5
0.9
0.2
0.2
0.2
0.2
0.2
0.2
0.2
0.2 | 10 μm DIF% (%) 0.5 9.0 0.5 9.0 0.6 6.6 7.6 2.8 4.1 5.1 10.15 11.0 1.9 2.3 0.5 5.7 12.6 12.27 1.2 2.2 0.9 4.2 9.9 4.2 0.9 4.2 5.8 5.0 0.9 5.6 0.16 8.6 8.6 0.0 1.6 8.6 9.2 3.7 19.26 19.26 | $\begin{array}{c} {\rm SD}(1\sigma)\\(\mu{\rm gg}{\rm g}^{-1})\\ 2.35\\ 4.38\\ 2.10\\ 1.45\\ 4.60\\ 1.22\\ 2.37\\ 1.69\\ 4.57\\ 2.23\\ 4.67\\ 1.72\\ 4.57\\ 1.22\\ 4.57\\ 1.69\\ 1.69\\ 1.69\\ 1.69\\ 1.69\\ 1.08\\ 2.73\\ 1.44\\ 1.08\\ 2.73\\ 1.09\\ 2.62\\ 1.65\\ 1.65\\ 1.65\\ 1.29\\ 3.47\\ 1.41\\ 1.87\\ 0.77\\ 1.31\\ 2.44\\ 1.83\\ 1.34\\ 3.26\\ 1.71\\ 1.41\\ 1.82\\ 1.72\\ 1.82\\ 1.72\\ 1.82\\ 1.72\\ 1.82\\ 1.72\\ 1.82\\ 1.72\\ 1.82\\ 1.72\\ 1.82\\ 1.72\\ 1.82\\ 1.72\\ 1.82\\ 1.72\\ 1.82\\ 1.82\\ 1.72\\ 1.82\\ 1.82\\ 1.72\\ 1.82\\ 1.82\\ 1.72\\ 1.82\\ 1.82\\ 1.72\\ 1.82\\ 1.82\\ 1.72\\ 1.82\\$ | RSD
(%)
5.91
10.9
5.08
3.700
11.57
3.31
5.81
3.95
5.43
12.55
5.43
12.55
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7.91
7.91
 | $\begin{array}{c} \text{Sensitivity} \\ (\text{cps} / \mu \ g \ g^{-1}) \\ 59 \\ 59 \\ 59 \\ 6 \\ 70 \\ 55 \\ 55 \\ 11 \\ 28 \\ 4 \\ 15 \\ 55 \\ 91 \\ 15 \\ 3 \\ 84 \\ 106 \\ 55 \\ 91 \\ 15 \\ 3 \\ 34 \\ 102 \\ 14 \\ 118 \\ 119 \\ 144 \\ 26 \\ 22 \\ 81 \\ 144 \\ 118 \\ 119 \\ 144 \\ 26 \\ 22 \\ 81 \\ 15 \\ 163 \\ 39 \\ 160 \\ 51 \\ 163 \\ 36 \\ 173 \\ 50 \\ 163 \\ 34 \\ \end{array}$ | DL (μ ε ε ε -1) 0.004 0.180 0.005 0.078 0.005 0.033 0.114 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.004 0.002 0. |
| Sc Ti V Cr M Co Ni Cu Z G a s b Sr Y Zr Nb 00 d Sn b S s a a ce Pr Nd Sn E G d b H Er Th b Luff Ta W Ti | RV (μ g g - 1) 39.9 44 36.4 35.5 38.8 36.1 35.7 36.1 35.7 36.1 37.7 37.4 28.1 38.6 34.7 28.1 38.6 34.7 37.9 38.6 34.7 32.7 36.1 37.9 35.5 37.7 36.3 37.7 35.5 37.7 35.5 38.3 38.3 38.3 38.3 38.3 38.3 38.3 38.3 38.3 38.3 38.3 38.3 38.3 39.2 37 36.7 37.6

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
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33.3
8.0
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3 | AV (μ ε ε ⁻¹) 38.1 42.6 42.7 35.5 38.8 35.5 43.8 76.9 39.4 40.3 38.9 40.3 38.9 40.3 38.9 40.3 38.9 40.3 38.9 40.3 38.9 40.3 38.9 40.3 38.9 40.3 38.9 40.3 38.4 27.1 39.1 49.0 30.4 32.6 35.0 32.6 35.0 32.6 35.0 32.6 36.4 36.4 35.6 34.6 34.0 41.2 34.6 34.0 <td>$\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.6 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.6 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.2 \\ 2.4 \\ \end{array}$</td> <td>20
µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.0.11
12.77
5.53
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8.5</td> <td>$\begin{array}{c} \text{SD} (1\sigma)\\ (\mueg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.60\\ 1.32\\ 1.12\\ 1.12\\ 1.80\\ 1.68\\ 1.88\\ 1.12\\ 1.12\\ 1.82\\ 1.82\\ 1.82\\ 1.82\\ 1.66\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.68\\ 0.80\\ 0.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.68\\ 0.86\\ 0.88\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 1.13\\ 1.00\\ 1.29\\ 0.62\\ 1.13\\ 1.00\\ 1.29\\ 0.62\\ 0.68\\ 0.88\\ 0.88\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 0.$</td> <td>RSD
(%)
3.25
4.0
5.95
5.04
2.62
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5.4
4.96
2.43
2.83
2.78
4.62
2.83
2.78
4.62
2.83
6.7
4.56
6.81
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2.02
2.02
2.02
2.0</td> <td>Sensitivity
(cps/ µg g⁻¹)
114
6
101
11
132
99
48
7
89
27
10
114
156
189
97
173
30
7
55
60
176
25
234
229
293
50
44
160
47
312
74
306
67
314
96
332
66
67
52</td> <td>DL (µ g g (1)) (µ g g (1)) 0.003 0.082 0.001 0.334 0.002 0.018 0.002 0.018 0.002 0.013 0.002 0.013 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.004 0.001 0.004 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 <t< td=""><td>$\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ (\eta \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.6 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 42,8 \\ 43,5 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 35,2 \\$</td><td>$\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \\ 3.4 \\ 0.5 \\ 1.4 \\ 7.3 \\ 1.9 \\ \end{array}$</td><td>10 μm DIF% 0.5 9.0 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 1.9 2.3 0.5 5.7 1.4 2.3 0.5 2.4 12.6 12.27 1.2 2.3 0.5 2.4 12.6 12.6 12.6 12.7 1.4 5.8 0.9 4.2 1.4 5.8 0.9 1.6 3.7 19.26 0.5 1.5 3.7 19.26</td><td>$\begin{array}{c} {\rm SD} \left(1\sigma\right)\\ \left(\mugg^{-1}\right)\\ 2.35\\ 4.38\\ 2.10\\ 1.45\\ 4.57\\ 2.23\\ 1.69\\ 4.57\\ 2.23\\ 5.32\\ 4.67\\ 1.22\\ 4.57\\ 1.22\\ 4.69\\ 1.09\\
1.09\\ 1.0$</td><td>RSD
(%)
5.91
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82</td><td>DL (µ = g = -1) 0.004 0.180 0.005 0.078 0.005 0.043 0.003 0.033 0.044 0.033 0.044 0.033 0.044 0.033 0.004 0.005 0.006 0.002 0.014 0.147 0.006 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.003 0.004 0.005 0.002 0.003 0.004 0.002 0.003 0.004</td></t<></td>
 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.6 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.6 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.6 \\ 0.1 \\ 1.5 \\ 3.6 \\ 1.2 \\ 2.4 \\ \end{array}$ | 20 µm
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8.5 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mueg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.60\\ 1.32\\ 1.12\\ 1.12\\ 1.80\\ 1.68\\ 1.88\\ 1.12\\ 1.12\\ 1.82\\ 1.82\\ 1.82\\ 1.82\\ 1.66\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.68\\ 0.80\\ 0.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.68\\ 0.86\\ 0.88\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 1.13\\ 1.00\\ 1.29\\ 0.62\\ 1.13\\ 1.00\\ 1.29\\ 0.62\\ 0.68\\ 0.88\\ 0.88\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 0.$ | RSD
(%)
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 | Sensitivity
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306
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314
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332
66
67
52 | DL (µ g g (1)) (µ g g (1)) 0.003 0.082 0.001 0.334 0.002 0.018 0.002 0.018 0.002 0.013 0.002 0.013 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.004 0.001 0.004 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 <t< td=""><td>$\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ (\eta \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.6 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 42,8 \\ 43,5 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 35,2 \\$</td><td>$\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \\ 3.4 \\ 0.5 \\ 1.4 \\ 7.3 \\ 1.9 \\ \end{array}$</td><td>10 μm DIF% 0.5 9.0 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 1.9 2.3 0.5 5.7 1.4 2.3 0.5 2.4 12.6 12.27 1.2 2.3 0.5 2.4 12.6 12.6 12.6 12.7 1.4 5.8 0.9 4.2 1.4 5.8 0.9 1.6 3.7 19.26 0.5 1.5 3.7 19.26</td><td>$\begin{array}{c} {\rm SD} \left(1\sigma\right)\\ \left(\mugg^{-1}\right)\\ 2.35\\ 4.38\\ 2.10\\ 1.45\\ 4.57\\ 2.23\\ 1.69\\ 4.57\\ 2.23\\ 5.32\\ 4.67\\ 1.22\\ 4.57\\ 1.22\\ 4.69\\ 1.09\\
1.0$</td><td>RSD
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82</td><td>DL (µ = g = -1) 0.004 0.180 0.005 0.078 0.005 0.043 0.003 0.033 0.044 0.033 0.044 0.033 0.044 0.033 0.004 0.005 0.006 0.002 0.014 0.147 0.006 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.003 0.004 0.005 0.002 0.003 0.004 0.002 0.003 0.004</td></t<> | $\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ (\eta \ g \ g^{-1}) \\ 39,7 \\ 40.1 \\ 39,2 \\ 39,8 \\ 37,0 \\ 40.6 \\ 41.6 \\ 32,7 \\ 41.0 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,2 \\ 39,9 \\ 37,4 \\ 38,1 \\ 41.1 \\ 41.1 \\ 41.1 \\ 42,8 \\ 43,5 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 47,9 \\ 39,2 \\ 39,1 \\ 37,2 \\ 39,2 \\ 35,2 \\$
 | $\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \\ 3.4 \\ 0.5 \\ 1.4 \\ 7.3 \\ 1.9 \\ \end{array}$ | 10 μm DIF% 0.5 9.0 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 1.9 2.3 0.5 5.7 1.4 2.3 0.5 2.4 12.6 12.27 1.2 2.3 0.5 2.4 12.6 12.6 12.6 12.7 1.4 5.8 0.9 4.2 1.4 5.8 0.9 1.6 3.7 19.26 0.5 1.5 3.7 19.26
 | $\begin{array}{c} {\rm SD} \left(1\sigma\right)\\ \left(\mugg^{-1}\right)\\ 2.35\\ 4.38\\ 2.10\\ 1.45\\ 4.57\\ 2.23\\ 1.69\\ 4.57\\ 2.23\\ 5.32\\ 4.67\\ 1.22\\ 4.57\\ 1.22\\ 4.69\\ 1.0$ | RSD
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173
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163
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82 | DL (µ = g = -1) 0.004 0.180 0.005 0.078 0.005 0.043 0.003 0.033 0.044 0.033 0.044 0.033 0.044 0.033 0.004 0.005 0.006 0.002 0.014 0.147 0.006 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.003 0.004 0.005 0.002 0.003 0.004 0.002 0.003 0.004
 |
| Sc Ti V Cr M co Ni cu n a ce s th Sr Y Zr bh o cd sn bh ss a la ce Pr bh Sm Li dh bh y bh ar m bh u hf a W Ti bh | RV
(µgg ⁻¹)
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14.7
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2.7 | AV (μ ε g ⁻¹) 38.1 42.6 35.5 35.7 35.7 38.9 37.2 38.9 37.2 38.9 37.2 38.9 37.2 38.9 37.2 38.9 37.1 41.1 39.1 49.0 40.3 38.9 27.1 41.1 39.1 49.0 40.2 34.4 37.4 35.8 35.8 36.6 34.0 34.7 36.4 36.7 38.4 34.6 34.0 34.0 34.0 34.0 34.0 34.0 34.0 34.0 34.0 34.0 <td>$\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.5 \\ 1.6 \\ 1.6 \\ 1.6 \\ 1.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 1.5 \\ 3.6 \\ 1.5
\\ 1.5 \\$</td> <td>20 µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.77
5.5
9
5.29
13.6
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4.37
1.9
2.7
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0.2.7
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7</td> <td>$\begin{array}{c} \text{SD} (1\sigma)\\ (\mugg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 2.05\\ 3.21\\ 1.32\\ 1.50\\ 3.21\\ 1.3\\ 1.6\\ 0.58\\ 1.82\\ 1.12\\ 1.12\\ 1.80\\ 1.47\\ 1.80\\ 1.47\\ 1.80\\ 1.47\\ 1.68\\ 0.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.66\\ 0.47\\ 1.18\\ 0.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.88\\ 0.77\\ 1.18\\ 1.00\\ 1.28\\ 1.13\\ 1.00\\ 1.28\\ 1.13\\ 1.09\\ 0.89\\ 0.88\\ 0.75\\ 1.18\\ 1.09\\ 1.28\\ 1.13\\ 1.00\\ 1.28\\ 1.13\\ 1.09\\ 0.89\\ 0.68\\ 0.75\\ 1.18\\ 1.09\\ 1.28\\ 1.13\\ 1.00\\ 1.28\\ 1.13\\ 1.09\\ 0.89\\ 0.68\\ 0.75\\ 1.18\\ 1.09\\ 1.28\\ 1.13\\ 1.00\\ 1.28\\ 1.13\\ 1.09\\ 0.89\\ 0.68\\ 0.75\\ 1.18\\ 1.08$</td> <td>RSD
(%)
3.25
4.0
3.90
5.95
5.04
4.262
4.96
3.30
5.4
4.96
3.30
7.82
2.83
4.62
3.88
6.7
8.2.83
6.7
8.462
3.83
6.7
8.462
3.83
6.7
8.462
4.56
6.81
3.166
3.25
5.40
4.04
2.101
1.16
3.26
3.26
3.27
2.93
3.27
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3.27
2.95
3.27
2.95
3.99</td> <td>Sensitivity
(cps/µgg⁻¹)
114
6
101
11
132
99
99
19
48
7
89
27
10
114
156
189
97
173
30
7
55
60
114
155
234
229
293
50
60
176
25
234
229
293
50
44
160
47
312
74
308
102
306
67
314
96
332
66
152
162</td> <td>DL
() () () () () () () () () () () () () (</td> <td>AV (µ g g '') 39,7 40,1 39,8 37,0 40,1 39,8 37,0 40,1 39,2 39,8 37,0 40,1 39,9 37,2 36,8 76,9 37,2 36,8 76,9 37,4 38,1 43,6 28,8 39,8 37,9,2 39,8 37,9,2 39,3 35,1 35,2 35,2 35,2 35,2 35,2 35,2 35,2 35,2 35,2 35,2 36,2 36,2 36,2 36,2 35,8 37,2 39,0 36,2 35,8<!--</td--><td>$\begin{array}{c} \text{DIF} \\ (\mu {\rm g g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 5.4 \\ 1.5 \\ 5.4 \\ 1.5 \\ 0.9 \\ 0.2 \\ 2.2 \\ 6.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 1.2 \\ 0.3 \\ 1.6 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 1.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \\ 0.5 \\ 1.4 \\ 7.3 \\ 1.9 \\ 4.6 \\ \end{array}$</td><td>10 μm DIF% (%) 0.5 9.0 0.5 9.0 10.15 11.0 11.0 11.0 12.8 11.0 1.9 2.3 0.5 5.7 12.6 12.27 1.2 0.2 2.4 12.6 0.9 4.2 0.9 4.2 0.9 4.2 0.9 4.2 0.9 5.8 0.0 1.6 8.6 0.0 1.6 8.6 0.7 19.26 12.7</td><td>$\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mu_{EE}^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.45 \\ 4.57 \\ 2.23 \\ 4.57 \\ 2.23 \\ 4.57 \\ 1.22 \\ 4.57 \\ 1.22 \\ 4.99 \\ 1.08 \\ 2.73 \\ 1.46 \\ 1.08 \\ 2.73 \\ 1.46 \\ 1.08 \\ 2.73 \\ 1.41 \\ 1.85 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.87 \\ 0.77 \\ 1.41 \\ 1.87 \\ 0.77 \\ 1.41 \\ 1.87 \\ 0.71 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.71 \\ 1.42 \\ 88 \\ 1.71 \\ 1.82 \\ 0.43 \\ 1.79 \\
1.79$</td><td>RSD
(%)
5.91
5.08
3.70
5.81
13.95
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14.45</td><td>$\begin{array}{c} \text{Sensitivity} \\ (\text{cps} / \mu g g^{-1}) \\ 59 \\ 59 \\ 59 \\ 6 \\ 70 \\ 55 \\ 11 \\ 28 \\ 4 \\ 15 \\ 55 \\ 84 \\ 106 \\ 55 \\ 91 \\ 15 \\ 3 \\ 84 \\ 106 \\ 55 \\ 91 \\ 15 \\ 3 \\ 34 \\ 102 \\ 14 \\ 118 \\ 119 \\ 144 \\ 26 \\ 22 \\ 81 \\ 144 \\ 118 \\ 119 \\ 144 \\ 26 \\ 22 \\ 81 \\ 15 \\ 163 \\ 39 \\ 160 \\ 51 \\ 163 \\ 36 \\ 173 \\ 50 \\ 163 \\ 34 \\ 82 \\ 56 \end{array}$</td><td>DL (µ g g -1) 0.004 0.180 0.005 0.078 0.005 0.08 0.003 0.003 0.004 0.333 0.114 0.003 0.004 0.033 0.014 0.003 0.004 0.002 0.014 0.147 0.002 0.002 0.002 0.002 0.002 0.002 0.012 0.002 0.012 0.002 0.002 0.002 0.003 0.002 0.004 0.002 0.005 0.002 0.006 0.002 0.007 0.001 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.005 0.004 0.005<!--</td--></td></td> | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.0 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.9 \\ 2.1 \\ 1.5 \\ 1.6 \\ 1.6 \\ 1.6 \\ 1.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\
1.5 \\ 3.6 \\ 1.5 \\ 1.5 \\ 3.6 \\ 1.5 \\$ | 20 µm
DIF%
(%)
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7 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mugg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 2.05\\ 3.21\\ 1.32\\ 1.50\\ 3.21\\ 1.3\\ 1.6\\ 0.58\\ 1.82\\ 1.12\\ 1.12\\ 1.80\\ 1.47\\ 1.80\\ 1.47\\ 1.80\\ 1.47\\ 1.68\\ 0.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.66\\ 0.47\\ 1.18\\ 0.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 0.68\\ 0.47\\ 1.18\\ 0.68\\ 0.47\\ 1.18\\ 0.88\\ 0.77\\ 1.18\\ 1.00\\ 1.28\\ 1.13\\ 1.00\\ 1.28\\ 1.13\\ 1.09\\ 0.89\\ 0.88\\ 0.75\\ 1.18\\ 1.09\\ 1.28\\ 1.13\\ 1.00\\ 1.28\\ 1.13\\ 1.09\\ 0.89\\ 0.68\\ 0.75\\ 1.18\\ 1.09\\ 1.28\\ 1.13\\ 1.00\\ 1.28\\ 1.13\\ 1.09\\ 0.89\\ 0.68\\ 0.75\\ 1.18\\ 1.09\\ 1.28\\ 1.13\\ 1.00\\ 1.28\\ 1.13\\ 1.09\\ 0.89\\ 0.68\\ 0.75\\ 1.18\\ 1.08$ | RSD
(%)
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7.82
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 | Sensitivity
(cps/µgg ⁻¹)
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99
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152
162 | DL
() () () () () () () () () () () () () (
 | AV (µ g g '') 39,7 40,1 39,8 37,0 40,1 39,8 37,0 40,1 39,2 39,8 37,0 40,1 39,9 37,2 36,8 76,9 37,2 36,8 76,9 37,4 38,1 43,6 28,8 39,8 37,9,2 39,8 37,9,2 39,3 35,1 35,2 35,2 35,2 35,2 35,2 35,2 35,2 35,2 35,2 35,2 36,2 36,2 36,2 36,2 35,8 37,2 39,0 36,2 35,8 </td <td>$\begin{array}{c} \text{DIF} \\ (\mu {\rm g g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 5.4 \\ 1.5 \\ 5.4 \\ 1.5 \\ 0.9 \\ 0.2 \\ 2.2 \\ 6.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 1.2 \\ 0.3 \\ 1.6 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 1.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \\ 0.5 \\ 1.4 \\ 7.3 \\ 1.9 \\ 4.6 \\ \end{array}$</td> <td>10 μm DIF% (%) 0.5 9.0 0.5 9.0 10.15 11.0 11.0 11.0 12.8 11.0 1.9 2.3 0.5 5.7 12.6 12.27 1.2 0.2 2.4 12.6 0.9 4.2 0.9 4.2 0.9 4.2 0.9 4.2 0.9 5.8 0.0 1.6 8.6 0.0 1.6 8.6 0.7 19.26 12.7</td> <td>$\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mu_{EE}^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.45 \\ 4.57 \\ 2.23 \\ 4.57 \\ 2.23 \\ 4.57 \\ 1.22 \\ 4.57 \\ 1.22 \\ 4.99 \\ 1.08 \\ 2.73 \\ 1.46 \\ 1.08 \\ 2.73 \\ 1.46 \\ 1.08 \\ 2.73 \\ 1.41 \\ 1.85 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.87 \\ 0.77 \\ 1.41 \\ 1.87 \\ 0.77 \\ 1.41 \\ 1.87 \\ 0.71 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.71 \\ 1.42 \\ 88 \\ 1.71 \\ 1.82 \\ 0.43 \\ 1.79
\\ 1.79 \\ 1.79$</td> <td>RSD
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 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mu_{EE}^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.60 \\ 1.22 \\ 2.37 \\ 1.45 \\ 4.57 \\ 2.23 \\ 4.57 \\ 2.23 \\ 4.57 \\ 1.22 \\ 4.57 \\ 1.22 \\ 4.99 \\ 1.08 \\ 2.73 \\ 1.46 \\ 1.08 \\ 2.73 \\ 1.46 \\ 1.08 \\ 2.73 \\ 1.41 \\ 1.85 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.65 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.87 \\ 0.77 \\ 1.41 \\ 1.87 \\ 0.77 \\ 1.41 \\ 1.87 \\ 0.71 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 3.26 \\ 1.71 \\ 1.42 \\ 88 \\ 1.71 \\ 1.82 \\ 0.43 \\ 1.79 $ | RSD
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14.45 | $\begin{array}{c} \text{Sensitivity} \\ (\text{cps} / \mu g g^{-1}) \\ 59 \\ 59 \\ 59 \\ 6 \\ 70 \\ 55 \\ 11 \\ 28 \\ 4 \\ 15 \\ 55 \\ 84 \\ 106 \\ 55 \\ 91 \\ 15 \\ 3 \\ 84 \\ 106 \\ 55 \\ 91 \\ 15 \\ 3 \\ 34 \\ 102 \\ 14 \\ 118 \\ 119 \\ 144 \\ 26 \\ 22 \\ 81 \\ 144 \\ 118 \\ 119 \\ 144 \\ 26 \\ 22 \\ 81 \\ 15 \\ 163 \\ 39 \\ 160 \\ 51 \\ 163 \\ 36 \\ 173 \\ 50 \\ 163 \\ 34 \\ 82 \\ 56 \end{array}$ | DL (µ g g -1) 0.004 0.180 0.005 0.078 0.005 0.08 0.003 0.003 0.004 0.333 0.114 0.003 0.004 0.033 0.014 0.003 0.004 0.002 0.014 0.147 0.002 0.002 0.002 0.002 0.002 0.002 0.012 0.002 0.012 0.002 0.002 0.002 0.003 0.002 0.004 0.002 0.005 0.002 0.006 0.002 0.007 0.001 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.005 0.004 0.005 </td
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| Sc Ti V Cr M Co Ni Cu Z G a s b Sr Y Zr Nb 00 d Sn b S s a a ce Pr Nd Si Lu G d b V O H Er Tr Y Lu Hf Ta W Ti Pb B | RV (μ g g - 1) 39.9 44 36.4 36.7 35.5 38.8 36.1 35.7 36.1 37.7 37.4 28.1 38.6 34.7 28.1 37.9 37.4 28.1 38.6 34.7 32.7 36.3 37.9 35.5 37.7 36.3 37.7 35.6 37.7 35.6 37.7 36.3 38.8 36.8 36.3 37.6 37.6 38.7 37.6 38.8 38.8 38.8 38.8 38.8 38.8 37.6 38.7 <tr td=""></tr>

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(cps/ µg g⁻¹)
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\\ 1.9 \\ 1.9$</td><td>10 μm DIF% 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 1.9 2.3 0.5 5.7 1.4 2.3 0.5 2.4 12.6 12.27 1.2 3.5 2.2 0.9 4.2 1.4 5.0 0.9 4.2 1.4 5.0 0.9 5.6 0.0 1.6 3.7 19.26 0.7 1.5 3.7 19.26 0.22.2</td><td>$\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.35 \\ 4.38 \\ 2.35 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.22 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.99 \\ 1.05 \\ 1.99 \\ 1.05 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 2.33 \\ 6.17 \\ 1.44 \\ 2.31 \\ 3.09 \\ 2.62 \\ 2.15 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.85 \\ 1.65 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.83 \\ 1.34 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 1.14 \\ 2.98 \\ 1.71 \\ 1.83 \\ 1.34 \\ 1.71 \\ 1.83 \\ 1.71 \\ 1.83 \\ 1.71 \\ 1.83 \\ 1.71 \\ 1.83 \\ 1.71 \\ 1.97 \\$</td><td>RSD
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\\ 1.6 \\$ | 20 µm
DIF%
(%)
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12.77
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8.5 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mueg^{-1})\\ 1.24\\ 1.72\\ 1.67\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 1.32\\ 2.02\\ 1.50\\ 3.21\\ 3.47\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.32\\ 1.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.47\\ 1.82\\ 1.88\\ 1.88\\ 0.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.47\\ 1.82\\ 1.87\\ 1.82\\ 1.88\\ 0.66\\ 0.60\\ 1.29\\ 0.62\\ 1.10\\ 1.75\\ 1.48\\ 0.68\\ 0.88\\ 0.68\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 0.88\\ 0.77\\ 1.18\\ 0.68\\ 0.88\\ 0.88\\ 0.88\\ 0.88\\ 0.88\\ 0.88\\ 0.89\\ 1.60\\ 0.89\\ 1.60\\ 0.89\\ 1.60\\ 0.89\\ 1.60\\ 0.89\\ 0.84\\ 0.84\\ 0.84\\ 0.88\\ 0.$ | RSD
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50 | DL (µ g g (1)) (µ g g (1)) 0.003 0.082 0.001 0.334 0.002 0.018 0.002 0.018 0.002 0.013 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.004 0.001 0.004 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 <t< td=""><td></td><td>$\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 2.1 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 0.3 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \\ 3.4 \\ 0.5 \\ 1.4 \\ 7.3 \\ 1.9 \\ 4.6 \\ 7.7 \\ 1.9 \\ 4.6 \\ 7.7 \\ 1.9$</td><td>10 μm DIF% 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 1.9 2.3 0.5 5.7 1.4 2.3 0.5 2.4 12.6 12.27 1.2 3.5 2.2 0.9 4.2 1.4 5.0 0.9 4.2 1.4 5.0 0.9 5.6 0.0 1.6 3.7 19.26 0.7 1.5 3.7 19.26 0.22.2</td><td>$\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.35 \\ 4.38 \\ 2.35 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.22 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.99 \\ 1.05 \\ 1.99 \\ 1.05 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 2.33 \\ 6.17 \\ 1.44 \\ 2.31 \\ 3.09 \\ 2.62 \\ 2.15 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.85 \\ 1.65 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.83 \\ 1.34 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 1.14 \\ 2.98 \\ 1.71 \\ 1.83 \\ 1.34 \\ 1.71 \\ 1.83 \\ 1.71 \\ 1.83 \\ 1.71 \\ 1.83 \\ 1.71 \\ 1.83 \\ 1.71 \\ 1.97
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 | $\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 2.1 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.5 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 1.6 \\ 0.5 \\ 2.1 \\ 0.3 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \\ 3.4 \\ 0.5 \\ 1.4 \\ 7.3 \\ 1.9 \\ 4.6 \\ 7.7 \\ 1.9 \\ 4.6 \\ 7.7 \\ 1.9$ | 10 μm DIF% 0.5 9.0 6.6 7.6 2.8 4.1 5.1 10.15 16.3 110.4 4.3 1.9 2.3 0.5 5.7 1.4 2.3 0.5 2.4 12.6 12.27 1.2 3.5 2.2 0.9 4.2 1.4 5.0 0.9 4.2 1.4 5.0 0.9 5.6 0.0 1.6 3.7 19.26 0.7 1.5 3.7 19.26 0.22.2
 | $\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1} \right) \\ 2.35 \\ 4.38 \\ 2.35 \\ 4.38 \\ 2.35 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.22 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.99 \\ 1.05 \\ 1.99 \\ 1.05 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 2.33 \\ 6.17 \\ 1.44 \\ 2.31 \\ 3.09 \\ 2.62 \\ 2.15 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.85 \\ 1.65 \\ 1.29 \\ 3.47 \\ 1.41 \\ 1.83 \\ 1.34 \\ 1.31 \\ 2.44 \\ 1.83 \\ 1.34 \\ 1.14 \\ 2.98 \\ 1.71 \\ 1.83 \\ 1.34 \\ 1.71 \\ 1.83 \\ 1.71 \\ 1.83 \\ 1.71 \\ 1.83 \\ 1.71 \\ 1.83 \\ 1.71 \\ 1.97 \\$ | RSD
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| Sc Ti V Cr M co Ni cu n a a ce Ar b co No do No do So So a a ce Prodom U do Br Ti V Cr M co Ni cu n a a ce Ar b M co No do No do So So So Ba a ce Prodom U do Br Ti V b u Hf a W Ti Po Bi Ti Po | RV
(µgg ⁻¹)
39.9
44
36.4
35.5
38.8
37.8
37.8
37.8
37.8
37.8
37.7
31.4
78.4
38.9
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37.0
37.0

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
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2.5
33.3
8.0
203
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0.0
0.0
2.7
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1.3
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0.2
5
33.3
8.0
203
0.0
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2.7 | AV (μ ε g ⁻¹) 38.1 42.6 38.1 42.7 36.6 35.5 43.8 39.9 37.2 38.9 31.1 32.8 76.9 39.4.0 38.9 38.9 32.8 76.9 39.4 40.3 38.9 38.4 27.1 41.1 39.1 49.0 40.2 34.4 37.4 33.8 32.3 35.6 35.8 36.7 38.4 32.3 35.8 36.7 38.4 36.7 38.4 37.3 36.4 36.7 38.4 37.7 36.4 36.2<

 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 1.5 \\ 1.1 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.1 \\ 1.5 \\ 1.6 \\ 1.0 \\ 4.1 \\ 3.2 \\ 2.7 \\ 1.6 \\ 1.6 \\ 1.0 \\ 4.1 \\ 3.2 \\ 2.7 \\ 1.6 \\ 1.5 \\ 3.6 \\ 1.5 \\ 3.6 \\ 1.6 \\ 1.5 \\ 3.6 \\ 1.6 \\ 1.7 \\ 2.1 \\ 3.6 \\ 3.2 \\ 2.4 \\ 4.4 \\ 6.0 \\ 0.1 \\$ | 20
µm
DIF%
(%)
4.6
3.1
10.2
0.77
5.6
0.11
12.75
5.29
4.9
3.4
9.529
1.3.6
4.03
4.37
1.9
2.7
3.6
6.50
0.7
14.84
2.2
0.8,89
7.0
8.4
4.0
8.9
7.0
8.4
4.2
9.31
4.2
9.31
4.2
9.55
5.29
7.0
8.4
4.2
9.7
1.2,7
5.5
5.29
7.0
8.9
7.0
8.4
4.0
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8.5
5.29
7.0
8.4
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7.5
7 | $\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mu\kappa\sigma^{-1})\\ 1.24\\ 1.72\\ 1.84\\ 0.93\\ 2.17\\ 2.18\\ 1.84\\ 0.93\\ 2.17\\ 2.18\\ 1.82\\ 1.02\\ 1.52\\ 1.32\\ 1.20\\ 3.21\\ 3.47\\ 0.58\\ 1.12\\ 1.80\\ 1.47\\ 1.88\\ 1.12\\ 1.80\\ 1.47\\ 1.82\\ 1.89\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 1.89\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 1.89\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 1.89\\ 0.62\\ 1.10\\ 1.75\\ 1.42\\ 1.13\\ 1.00\\ 1.28\\ 1.13\\ 1.00\\ 1.13\\ 1.00\\ $ | RSD
(%)
3.25
4.0
5.95
5.04
2.62
4.96
5.04
2.62
4.96
5.04
4.96
5.04
2.83
3.30
5.44
4.62
2.83
4.62
2.83
4.62
4.96
6.81
3.86
6.7
4.96
6.81
3.86
6.7
4.96
6.81
3.85
5.40
4.94
4.95
5.55
4.96
4.96
4.96
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4.96
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7.92
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7.95
7.92
7.95
7.92
7.95
7.95
7.95
7.95
7.95
7.95
7.95
7.95
 | Sensitivity
(cps/µgg ⁻¹)
114
6
101
11
132
99
19
48
7
7
89
27
10
114
156
189
97
173
30
7
7
55
60
176
25
234
229
293
50
44
4229
293
50
44
160
47
312
74
308
102
306
67
314
96
332
66
152
106
166
166 | DL (µ g g '') 0.003 0.082 0.001 0.334 0.002 0.0118 0.002 0.018 0.002 0.013 0.035 0.663 0.002 0.013 0.035 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 </td <td>$\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ 39.7 \\ 40.1 \\ 41.3 \\ 39.2 \\ 39.8 \\ 37.0 \\ 40.6 \\ 41.6 \\ 41.6 \\ 42.7 \\ 41.0 \\ 39.9 \\ 37.2 \\ 36.9 \\ 37.2 \\ 39.9 \\ 37.2 \\ 38.1 \\ 41.1 \\ 43.6 \\ 43.5 \\ 39.9 \\ 37.2 \\ 39.2 \\ 38.1 \\ 41.1 \\ 43.6 \\ 38.1 \\ 39.9 \\ 37.2 \\ 39.2 \\ 38.1 \\ 37.2 \\ 39.2 \\ 39.2 \\ 39.2 \\ 35.2$</td> <td>DIF
(µgg⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
1.5
5.4
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.3
1.6
1.5
1.5
1.5
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.3
1.6
1.5
1.5
1.5
1.5
1.5
1.5
1.5
1.5</td> <td>10 μm DIF% (%) 0.5 9.0 0.5 9.0 1.1 0.5 9.0 1.1 1.1 1.1 1.1 1.1 1.2 1.2 1.2.7 1.2.5 2.2 0.2 0.2 1.2.7 1.2.6 0.9 4.2 0.9 4.2 0.9 5.0 0.01 1.4 5.8 0.0 1.4 5.8 0.0 1.6 8.6 0.0 1.6 8.6 9.2 3.7 11.9 2.4 1.5 1.6 1.6 1.7 1.2.6</td> <td>$\begin{array}{c} {\rm SD}(1\sigma)\\(\mu{\rm gg}{\rm gr}^{-1})\\ 2.35\\ 4.38\\ 2.10\\ 1.45\\ 4.60\\ 1.22\\ 2.37\\ 1.69\\ 4.57\\ 2.23\\ 4.67\\ 1.72\\ 4.57\\ 2.532\\ 4.67\\ 1.72\\ 4.09\\ 1.08\\ 2.73\\ 1.49\\ 1.08\\ 2.73\\ 1.65\\ 1.65\\ 1.65\\ 1.65\\ 1.65\\ 1.65\\ 1.29\\ 3.47\\ 1.44\\ 1.83\\ 1.65\\ 1.65\\ 1.65\\ 1.29\\ 3.47\\ 1.41\\ 1.87\\ 0.77\\ 1.31\\ 2.44\\ 1.83\\ 1.34\\ 3.26\\ 1.71\\ 1.31\\ 2.44\\ 1.83\\ 1.34\\ 3.26\\ 1.71\\ 1.31\\ 2.44\\ 1.83\\ 1.34\\ 3.26\\ 1.71\\ 1.41\\ 1.82\\ 0.43\\ 1.79\\ 1.27\\ 1.2$</td> <td>RSD
(%)
5.91
10.9
3.700
11.57
3.31
5.81
3.945
13.395
5.43
3.71
5.32
2.81
4.67
5.32
2.81
4.67
5.32
2.81
6.26
2.63
6.26
6.26
6.26
6.26
6.26
6.26</td> <td>Sensitivity
(cps/ µ g g⁻¹)
59
6
70
55
55
11
28
4
8
4
8
15
5
59
84
106
55
59
84
106
55
55
91
15
3
3
4
102
14
118
119
144
228
34
102
14
118
119
144
228
81
25
168
39
160
51
163
34
25
56
86
102</td> <td>DL (µ = g e^{-1}) 0.004 0.180 0.005 0.078 0.005 0.033 0.133 0.004 0.033 0.114 0.004 0.002 0.002 0.014 0.002 0.014 0.002 0.014 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.003 0.004 0.003 0.003</td>
 | $\begin{array}{c} \hline AV \\ (\mu \ g \ g^{-1}) \\ 39.7 \\ 40.1 \\ 41.3 \\ 39.2 \\ 39.8 \\ 37.0 \\ 40.6 \\ 41.6 \\ 41.6 \\ 42.7 \\ 41.0 \\ 39.9 \\ 37.2 \\ 36.9 \\ 37.2 \\ 39.9 \\ 37.2 \\ 38.1 \\ 41.1 \\ 43.6 \\ 43.5 \\ 39.9 \\ 37.2 \\ 39.2 \\ 38.1 \\ 41.1 \\ 43.6 \\ 38.1 \\ 39.9 \\ 37.2 \\ 39.2 \\ 38.1 \\ 37.2 \\ 39.2 \\ 39.2 \\ 39.2 \\ 35.2$
 | DIF
(µgg ⁻¹)
0.2
3.9
2.5
2.8
1.1
1.5
2.0
3.8
6.4
4.1
1.5
5.4
1.5
5.4
1.5
0.9
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.3
1.6
1.5
1.5
1.5
0.2
2.2
6.2
0.7
4.9
4.4
5.2
0.3
1.6
1.5
1.5
1.5
1.5
1.5
1.5
1.5
1.5 | 10 μm DIF% (%) 0.5 9.0 0.5 9.0 1.1 0.5 9.0 1.1 1.1 1.1 1.1 1.1 1.2 1.2 1.2.7 1.2.5 2.2 0.2 0.2 1.2.7 1.2.6 0.9 4.2 0.9 4.2 0.9 5.0 0.01 1.4 5.8 0.0 1.4 5.8 0.0 1.6 8.6 0.0 1.6 8.6 9.2 3.7 11.9 2.4 1.5 1.6 1.6 1.7 1.2.6 | $\begin{array}{c} {\rm SD}(1\sigma)\\(\mu{\rm gg}{\rm gr}^{-1})\\ 2.35\\ 4.38\\ 2.10\\ 1.45\\ 4.60\\ 1.22\\ 2.37\\ 1.69\\ 4.57\\ 2.23\\ 4.67\\ 1.72\\ 4.57\\ 2.532\\ 4.67\\ 1.72\\ 4.09\\ 1.08\\ 2.73\\ 1.49\\ 1.08\\ 2.73\\ 1.65\\ 1.65\\ 1.65\\ 1.65\\ 1.65\\ 1.65\\ 1.29\\ 3.47\\ 1.44\\ 1.83\\ 1.65\\ 1.65\\ 1.65\\ 1.29\\ 3.47\\ 1.41\\ 1.87\\ 0.77\\ 1.31\\ 2.44\\ 1.83\\ 1.34\\ 3.26\\ 1.71\\ 1.31\\ 2.44\\ 1.83\\ 1.34\\ 3.26\\ 1.71\\ 1.31\\ 2.44\\ 1.83\\ 1.34\\ 3.26\\ 1.71\\ 1.41\\ 1.82\\ 0.43\\ 1.79\\ 1.27\\
1.27\\ 1.2$ | RSD
(%)
5.91
10.9
3.700
11.57
3.31
5.81
3.945
13.395
5.43
3.71
5.32
2.81
4.67
5.32
2.81
4.67
5.32
2.81
6.26
2.63
6.26
6.26
6.26
6.26
6.26
6.26 | Sensitivity
(cps/ µ g g ⁻¹)
59
6
70
55
55
11
28
4
8
4
8
15
5
59
84
106
55
59
84
106
55
55
91
15
3
3
4
102
14
118
119
144
228
34
102
14
118
119
144
228
81
25
168
39
160
51
163
34
25
56
86
102 | DL (µ = g e^{-1}) 0.004 0.180 0.005 0.078 0.005 0.033 0.133 0.004 0.033 0.114 0.004 0.002 0.002 0.014 0.002 0.014 0.002 0.014 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.003 0.004 0.003 0.003 |
| Sc Ti V Cr M Co Ni Cu Z G a s b Sr Y Zr Nb M Cd Sn b S s a a ce Pr Nd M L Gd b V M Fr M b L Hf Ta W Ti Pb Bi Th | RV (μ g g - 1) 39.9 44 38.3 36.4 35.5 38.8 36.1 35.7 36.1 37.7 37.4 28.1 38.6 34.7 28.7 36.1 37.9 38.3 37.9 38.6 38.7 38.6 38.7 36.1 37.9 35.5 37.7 36.3 37.79 35.5 38.4 37.7 35.5 38.3 38.4 37.7 37.6 38.3 38.3 38.3 38.3 38.4 37.76 38.7 37.78 314.9 38.57 30.2<

 | BG
(cps)
227
11.1
22.2
47.8
1103
10.7
141
113
33.3
4.0
247
14.7
76
1.3
2.7
4.0
0.0
2.5
33.3
8.0
203
0.0
2.7
1.3
1.3
2.0
2.7
1.3
0.0
0.0
2.7
1.3
1.3
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1.3
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1.3
1.3
2.7
1.3
0.0
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2.7
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 | $\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 1.8 \\ 1.4 \\ 3.9 \\ 0.3 \\ 2.1 \\ 0.0 \\ 5.0 \\ 2.1 \\ 1.9 \\ 2.0 \\ 4.9 \\ 1.4 \\ 1.5 \\ 1.1 \\ 2.4 \\ 0.0 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.4 \\ 1.5 \\ 1.6 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.6 \\ 1.0 \\ 1.0 \\ 1.5 \\ 3.6 \\ 3.2 \\ 2.4 \\ 4.4 \\
6.0 \\ 0.1 \\ 1.5 $ | 20 µm
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RSD
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6240 | DL (µ g g (1)) (µ g g (1)) 0.003 0.082 0.001 0.334 0.002 0.013 0.002 0.018 0.002 0.013 0.002 0.013 0.002 0.001 0.002 0.001 0.002 0.001 0.004 0.001 0.004 0.001 0.004 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 <t< td=""><td></td><td>$\begin{array}{c} \text{DIF} \\ (\mu_{B~g}^{-1}) \\ 0.2 \\ 3.9 \\ 2.5 \\ 2.8 \\ 1.1 \\ 1.5 \\ 2.0 \\ 3.8 \\ 6.4 \\ 4.1 \\ 3.8 \\ 1.5 \\ 2.0 \\ 2.2 \\ 0.7 \\ 4.4 \\ 5.2 \\ 0.2 \\ 2.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 4.9 \\ 4.4 \\ 5.2 \\ 0.7 \\ 1.2 \\ 0.8 \\ 0.1 \\ 0.3 \\ 2.1 \\ 0.0 \\ 0.6 \\ 3.4 \\ 3.4 \\ 0.5 \\ 1.4 \\ 7.3 \\ 1.9 \\ 4.6 \\ 6.7 \\ 1.4$</td><td>10 μm DIF% 0.5 9.0 0.5 9.0 10.15 16.3 110.4 4.3 12.6 5.7 2.3 0.5 5.7 12.6 12.27 12.6 12.27 3.5 2.2 0.9 4.2 5.0 0.2 0.4 1.4 5.5 2.4 12.6 12.7 1.5 3.7 19.26 3.7 19.27 1.5 3.7 19.26 3.8</td><td>$\begin{array}{c} {\rm SD} \left(1\sigma \right) \\ \left(\mugg^{-1} \right) \\ \left(2.35 \\ 4.38 \\ 2.10 \\ 1.45 \\ 4.57 \\ 2.23 \\ 1.69 \\ 4.57 \\ 2.23 \\ 5.32 \\ 4.67 \\ 2.23 \\ 5.32 \\ 4.67 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.94 \\ 1.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 2.31 \\ 3.09 \\ 1.05 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.94 \\ 1.08 \\ 1.71 \\ 1.41 \\ 1.83 \\ 1.34 \\ 1.83 \\ 1.34 \\ 1.71 \\ 1.83 \\ 1.34 \\ 2.86 \\ 1.14 \\ 2.88 \\ 1.71 \\ 1.83 \\ 1.34 \\ 1.71 \\ 1.83 \\ 1.34 \\ 1.71 \\ 1.83 \\ 1.34 \\ 1.71 \\ 1.83 \\ 1.71 \\ 1.28 \\ 1.71 \\ 1.28 \\ 1.27 \\ 1.28 \\ 1.28 \\ 1.27 \\ 1.28 \\
1.2$</td><td>RSD
(%)
5.08
3.700
5.81
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13.95
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(cps/ µ g g⁻¹)
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RV: reference value of Jochum *et al.* (2011), AV: averaged value of analytical result, DIF: difference from reference value, DIF%: percentage of DIF against RV, SD: standard deviation of analytical values, RSD: relative standard deviation of analytical values, LD: lower limits of detection.



Fig. 4 DIF% for the Ca-normalized values determined for various pit diameters from the reference values by Jochum *et al.* (2011). Values for (a) NIST 615 and (b) NIST 613.

V, Co, Cu, Ga, Rb, Sr, Nb, Mo, Cd, Cs, Ba, La, Ce, Nd, Eu, W, Tl, Bi, and U for 20 μ m had DIFs less than 10 %. In addition, As, Nd, and Sm for 100 μ m, Cr, Ga, Ge, Gd, Tb, Dy, Ho, and Th for 80 μ m, Co, Ge, As, Ce, Nd, Sm, Gd, Yb, and W for 40 μ m, and Pr and Pb for 20 μ m had DIF < 15 %, while Cr for 100 μ m, Cu, Zr, and Hf for 80 μ m, V, Cr, Cu, Zn, Y, Zr, Mo, Cd, Tb, Dy, Ho, Er, Tm, Lu, Hf, and Th for 40 μ m, and Ti, Mn, Y, Sn, Sb, Sm, Gd, Dy, Er, Tm, Yb, Hf, Ta, and Th for 20 μ m had DIFs less than 30 %.

The only elements with poor accuracy for all laser spot diameters was Sc. Relatively high concentration compared to a reference value has also been reported by Kurosawa et al. (2002) and Morishita et al. (2005). Regnery et al. (2010) suggested that molecules at mass number 45 have a strong influence on the accuracy of Sc measurements, especially for Sc $< 30 \mu g g^{-1}$ when using low mass resolution instruments (quadrupole ICP-MS). As described below, the analytical results for NIST 613 (Sc 39.9 µg g⁻¹) were very precise, and the result supported the suggestion given by Regnery et al. (2010). Thus, careful evaluation would be required for accuracy in the quantitative result of $Sc < 30 \mu g$ g⁻¹. For other elements with poor accuracy, the accuracy was improved, in some cases, even though the laser spot diameter was smaller. The results in these cases suggest that the relatively poor reproducibility affected the accuracy, such as abrupt signal spikes in some replicate analyses. Similarly, for a laser spot diameter of 20 µm, a small signal/background ratio would be the fundamental cause of poor accuracy.

Table 4 and Fig. 4b show the analytical results for NIST 613 using NIST 611 as an external calibration standard. Precision was less than 30 % for all elements and all laser spot sizes. The accuracy was mostly less than 15 % for all laser spot diameters, except for a rather systematically large DIF for Bi. From these results, samples with concentrations similar to that of the NIST 613 reference glass (> 30 μ g g⁻¹) can be quantitatively analyzed with accuracy, even with a laser spot diameter of 10 μ m with which the precision is small.

Five replicate analyses for NIST 615 and NIST 613 were conducted continuously after the first set of calibration blank and calibration standard analyses. The effect of serious instrumental drift during the five replicate analyses was not observed, as shown in Table 3. Therefore, five replicate analyses after a set of calibration blank and calibration standard analyses was allowed for unknown quantitative analysis.

3.2.3 Crater depths

Penetration of object minerals/glasses during analysis of thin section samples is a potential serious problem during analysis where a large number of elements are measured with a long ablation time. To evaluate the depth of the laser pit (crater) for analyses of natural clinopyroxene (Cpx), amphiboles (Amp), and plagioclase (Pl), the crater depth was measured under given conditions using a confocal microscopy (HD-100, Lasertec Corporation; $50 \times$ objective lens and numerical aperture 0.95) at the National Metrology Institute of Japan, AIST (Fig. 5). Based on these results, the estimated crater depth for appropriate ablation conditions were determined to be Cpx 26 µm, Amp 19 µm, and Pl 19 µm for a 100 µm laser spot diameter, Cpx 28 µm, Amp 20 µm, and Pl 20 µm for a 40 µm laser spot diameter, and Cpx 28 µm, Amp 18 µm, and Pl 19 µm for a 20 µm laser spot diameter. Although analysis of Cpx requires care, penetration would not occur for thin section samples with a standard thickness of *ca.* 30 µm.

4. Application: analytical condition and accuracy for analyses of silicate minerals

In the previous sections, analysis of 45 elements (+ 1 internal standard element) in a single run was discussed. The analysis of such a large number of elements with a single run is not common, and a reduction of the analyte elements and ablation time, and/ or an increase in the number of sweep times appropriate for the analytical objective would lead to more stable and accurate results. Although it is presumed that an analytical protocol and its accuracy for a particular geochemical object would be reported separately, two suites of analytical programs for the general discussion of petrological and geochemical studies on silicate minerals and volcanic glasses were prepared in this study. The precision and accuracy of those two sets are reported below as general-purpose analytical programs in the GSJ-Lab.

4.1 Set 1 (Sc, Ti, V, Mn, Co, Ni, Cr, Rb, Sr, Y, Zn, Zr, Nb, Cs, Ba, lanthanides, Hf, Ta, Pb, Th and U)

As assumed analytical objects of Cpx, Amp, garnet, and biotite, an analytical program for 34 elements (+ 1 internal standard element) of Sc, Ti, V, Mn, Co, Ni, Cr, Rb, Sr, Y, Zn, Zr, Nb, Cs, Ba, lanthanides, Hf, Ta, Pb, Th, and U was prepared as Set 1. In Set 1, the sweep of the entire mass range was increased to 30 times, owing to a reduction of acquisition time for a single scan. As a result, the total acquisition time was *ca*. 34 s. Using the Set 1 program, five times replicate analyses with laser spot diameters of 80, 40, 20, and 10 μ m were conducted on NIST 615 using NIST 613 as an external calibration standard. The averaged results, DIFs between the averaged and reference values by Jochum *et al.* (2011), SD, RSD, sensitivity, and DL are given in Table 5.

Precision was mostly less than 20 % for $80-40 \mu m$ laser spot diameters and less than 30 % for a 20 μm laser spot diameter, although many of the elements were > 30 % for a 10 μm laser



Fig. 5 Example of crater depth measurement using a confocal microscope. (a) Photomicrograph of crater after laser ablation of hornblende (open Nicol). The square indicates the location of panel (b). (b) All-focused confocal microscope image. The image area was scanned by many slices of focuses and reconstructed as an all-focus image. The white line across the center of the crater indicates the location of panel (c). (c) Software screen showing surface profile along the line in panel (b). Precise measurement on any two points is possible. Note: scale bar is superimposed on the screenshot for convenience.

spot diameter. A comparison of the analytical results and reference values by Jochum *et al.* (2011) is shown in Fig. 6. DIFs for all elements and for all laser spot sizes were less than 30 %, except for Sc. For spot sizes of 20 and 10 μ m, quantitative results could not be obtained for some elements in some runs because the background intensities were larger than the signal intensities. While quantitative values were obtained, the values were not far from those by Jochum *et al.* (2011); therefore, these results are shown as the reference values in this study.

The estimated crater depths for analyses of Cpx, Amp, and Pl using the Set 1 program were Cpx 23 μ m, Amp 17 μ m, and Pl 16 μ m for a laser spot diameter of 100 μ m, Cpx 24 μ m, Amp 17 μ m, and Pl 17 μ m for a 40 μ m diameter, and Cpx 25 μ m, Amp 16 μ m, and Pl 17 μ m for a 20 μ m diameter. Thus, penetration would not occur during analyses of standard thickness thin section samples (*ca.* 30 μ m).

4.2 Set 2 (Sc, V, Rb, Sr, Y, Zr, Nb, Ba, lanthanides, Hf, Ta, Pb, Th and U)

As assumed analytical objects of Pl, an analytical program for 27 elements (+ 1 internal standard element) of Sc, V, Rb, Sr, Y, Zr, Nb, Ba, lanthanides, Hf, Ta, Pb, Th, and U was prepared as Set 2. Sweeps were increased to 50 times for Set 2 and the total acquisition time was *ca*. 32 s. Using the Set 2 program, five times replicate analyses for laser spot diameters of 80, 40, 20, and 10 μ m were conducted on NIST 615 using NIST 613 as an external calibration standard. Averaged results, DIFs between the averaged and reference values by Jochum *et al.* (2011), SD, RSD, sensitivity, and DL are given in Table 6.

Precision was less than 20 % for all elements for $80-40 \ \mu m$ laser spot diameters. For laser spot sizes of 20 and 10 μm , several elements showed precision greater than 30 %. A comparison of the analytical results and reference values by Jochum *et al.*

Table 5 Quantitative results of replicate analyses (N=5) for NIST 615 determined using four pit diameters (80, 40, 20, and 10 μ m) by elemental Set 1.

				80 µm							40 µm				
	RV	AV	DIF	DIF%	SD (1σ)	RSD	Sensitivity	DL	AV	DIF	DIF%	SD (1σ)	RSD	Sensitivity	DL
	$(\mu g g^{-1})$	$(\mu g g^{-1})$	$(\mu g g^{-1})$	(%)	$(\mu g g^{-1})$	(%)	$(cps/\mu g g^{-1})$	$(\mu g g^{-1})$	$(\mu g g^{-1})$	(µgg ⁻¹)	(%)	$(\mu g g^{-1})$	(%)	$(cps/\mu g g^{-1})$	$(\mu g g^{-1})$
Sc	0.74	2.95	2.21	298	0.190	6.44	1292	0.001	3.36	2.62	354	0.452	13.44	293	0.001
Ti	3.61	2 84	0.77	21.4	0 436	15.4	77	0.013	3 54	0.07	2 02	1 2 1 6	34.4	15	0.087
v	1.01	0.93	0.08	8.39	0.082	8 89	1499	0.001	1.06	0.05	5 42	0.161	15.08	292	0.002
Cr	1 19	0.89	0.30	25.59	0.163	18.5	144	0.007	1.00	0.00	117	0.718	68.4	30	0.068
Mn	1.10	1 33	0.00	6.2	0.096	7 2 3	1655	0.001	1 39	0.03	2	0.566	40.81	324	0.005
Co	0.70	0.71	0.03	10.2	0.030	2.04	1202	0.001	0.96	0.03	05	0.007	11 27	270	0.000
00	0.75	0.71	0.08	10.7	0.021	2.94	1292	0.001	0.80	0.07	10.0	0.097	47.5	270	0.002
	1.1	0.87	0.23	Z1.Z	0.108	12.43	208	0.004	0.97	0.13	12.2	0.459	47.5	58	0.040
Ζn	2.79	2.47	0.32	11.6	0.283	11.48	91	0.012	3.36	0.57	20.4	0.796	23.7	20	0.085
Rb	0.855	0.90	0.05	5.53	0.077	8.58	1352	0.001	0.91	0.05	6.3	0.027	2.92	259	0.002
Sr	45.8	43.7	2.1	4.48	1.946	4.45	1736	0.000	47.1	1.3	2.83	1.569	3.33	335	0.000
Y	0.79	0.81	0.02	3.10	0.037	4.51	1705	0.000	0.82	0.03	3.2	0.082	10.10	398	0.001
Zr	0.848	0.85	0.00	0.00	0.088	10.38	929	0.001	0.99	0.15	17.3	0.076	7.66	215	0.002
Nb	0.824	0.82	0.00	0.23	0.007	0.81	1782	0.000	0.84	0.02	2.53	0.046	5.4	385	0.001
Cs	0.664	0.76	0.09	13.9	0.144	19.0	1987	0.000	0.77	0.11	16.5	0.067	8.62	401	0.001
Ba	3.2	3.08	0.12	3.78	0.170	5.51	259	0.004	3.21	0.01	0.32	0.327	10.20	51	0.008
La	0 72	0 70	0.02	3 33	0.011	1 56	1999	0 0 0 0	0 76	0.04	5 57	0.086	11.32	447	0.001
Ce	0.813	0.75	0.06	7.5	0.055	7.31	2253	0.000	0.84	0.03	3.35	0.088	10.46	465	0.001
Dr.	0.768	0.73	0.00	1 68	0.000	1 34	2508	0.000	0.78	0.00	1.02	0.086	11 04	537	0.001
Nd	0.752	0.75	0.04	12.00	0.052	9.04	132	0.000	0.70	0.01	2.02	0.000	170	0/	0.001
C	0.752	0.00	0.03	10.57	0.003	12.4	402	0.002	0.77	0.02	11 11	0.137	07.0	70	0.012
5.00	0.734	0.03	0.08	10.37	0.107	12.9	1001	0.003	0.84	0.08	0.70	0.220	27.0	79	0.011
Eu	0.77	0.74	0.03	4.52	0.059	8.03	1301	0.001	0.79	0.02	2.79	0.078	9.9	303	0.002
Gd	0.763	0.76	0.01	0.94	0.100	13.21	344	0.002	0.72	0.04	5.7	0.089	12.43	88	0.008
Tb	0.739	0.74	0.00	0.67	0.043	5.81	2172	0.000	0.84	0.10	14.0	0.061	7.22	577	0.001
Dy	0.746	0.72	0.02	3.06	0.043	6.0	530	0.002	0.81	0.07	9.23	0.068	8.41	139	0.003
Ho	0.749	0.72	0.03	4.40	0.057	8.01	2031	0.000	0.85	0.10	13.4	0.085	10.05	546	0.000
Er	0.74	0.75	0.01	1.10	0.064	8.49	685	0.001	0.81	0.07	9.7	0.050	6.10	185	0.003
Tm	0.732	0.67	0.06	7.81	0.042	6.22	2205	0.000	0.78	0.05	6.4	0.054	6.89	583	0.001
Yb	0.777	0.76	0.02	2.1	0.086	11.3	459	0.001	0.81	0.03	4.0	0.113	14.02	121	0.007
Lu	0 732	0.73	0.01	0.89	0.062	8 5 4	2084	0.000	0.80	0.06	87	0.043	5 4 5	555	0.001
Hf	0 711	0.74	0.03	3 95	0.036	4 92	590	0.001	0.77	0.05	77	0 137	17.88	170	0.005
Та	0.909	0.74	0.06	7.24	0.000	5 75	2127	0.001	0.97	0.00	3.65	0.107	5.67	575	0.000
	0.000	0.75	0.00	2.24	0.043	0.70	2127	0.000	0.04	0.03	6 10	0.040	5.07	075	0.001
	2.32	2.23	0.09	0.74	0.164	0.22	990	0.001	2.10	0.14	1.0	0.121	11.00	200	0.001
in	0.746	0.77	0.02	2.70	0.041	10.00	1049	0.000	0.70	0.01	1.2	0.090	11.09	4/0	0.001
U	0.023	0.63	0.01	0.7	0.065	10.03	2096	0.000	0.62	0.00	0.45	0.072	0.0	039	0.000
				20 <i>u</i> m							10 // m				
	RV		DIF	20 μm	SD (1 σ.)	RSD	Sensitivity			DIF	10 μm	SD (1 σ.)	RSD	Sensitivity	
	RV	AV	DIF	20 μm DIF%	$SD(1\sigma)$	RSD	Sensitivity	DL	AV	DIF	<u>10 μm</u> DIF%	$SD(1\sigma)$	RSD	Sensitivity	DL
6-	$\frac{(\mu g g^{-1})}{0.74}$	$\frac{AV}{(\mu g g^{-1})}$	DIF $(\mu g g^{-1})$	20 μm DIF% (%)	SD (1σ) $(\mu g g^{-1})$	RSD (%)	Sensitivity (cps/ μ gg ⁻¹)	$\frac{DL}{(\mu g g^{-1})}$	$\frac{AV}{(\mu g g^{-1})}$	DIF $(\mu g g^{-1})$	<u>10 μm</u> DIF% (%)	SD (1σ) $(\mu g g^{-1})$	RSD (%)	Sensitivity (cps/ μ gg ⁻¹)	$\frac{DL}{(\mu g g^{-1})}$
Sc	RV (μ g g ⁻¹) 0.74 2.61	$\frac{\text{AV}}{(\mu \text{g g}^{-1})}$ 3.26	DIF ($\mu g g^{-1}$) 2.52	20 μm DIF% (%) 340	SD (1 σ) ($\mu g g^{-1}$) 0.613	RSD (%) 18.81	Sensitivity (cps/µgg ⁻¹) 108	DL ($\mu g g^{-1}$) 0.004	AV ($\mu g g^{-1}$) 3.78 2.67	DIF $(\mu g g^{-1})$ 3.04	<u>10 μm</u> DIF% (%) 411	SD (1 σ) ($\mu g g^{-1}$) 0.495	RSD (%) 13.09	Sensitivity (cps/ μ gg ⁻¹) 64	DL ($\mu g g^{-1}$) 0.008 2.450
Sc Ti	RV $(\mu g g^{-1})$ 0.74 3.61	ΑV (μgg ⁻¹) 3.26 3.63	DIF (μ g g ⁻¹) 2.52 0.02	20 μm DIF% (%) 340 0.5	SD (1σ) $(\mu g g^{-1})$ 0.613 0.908	RSD (%) 18.81 25.0	Sensitivity $\frac{(cps/\mu g g^{-1})}{108}$ 6 107	DL (μ g g ⁻¹) 0.004 0.359	AV $(\mu g g^{-1})$ 3.78 3.67 0.04	DIF (μ gg ⁻¹) 3.04 0.06	<u>10 μm</u> DIF% (%) 411 <i>1.7</i>	SD (1σ) $(\mu g g^{-1})$ 0.495 1.639	RSD (%) 13.09 <i>44.63</i>	Sensitivity $\frac{(cps/\mu g g^{-1})}{64}$ 4	DL $(\mu g g^{-1})$ 0.008 2.450
Sc Ti V	RV $(\mu g g^{-1})$ 0.74 3.61 1.01	AV $(\mu g g^{-1})$ 3.26 3.63 1.05 (12)	DIF (μ g g ⁻¹) 2.52 0.02 0.04	20 μm DIF% (%) 340 0.5 4.1	SD (1σ) $(\mu g g^{-1})$ 0.613 0.908 0.125	RSD (%) 18.81 25.0 11.9	Sensitivity (cps/µgg ⁻¹) 108 6 127	DL $(\mu g g^{-1})$ 0.004 0.359 0.002 0.02	AV $(\mu g g^{-1})$ 3.78 3.67 0.94 4.22	DIF (μ gg ⁻¹) 3.04 0.06 0.07	10 μm DIF% (%) 411 <i>1.7</i> 7.36	SD (1σ) $(\mu g g^{-1})$ 0.495 1.639 0.246	RSD (%) 13.09 44.63 26.30	Sensitivity (cps/ µ g g ⁻¹) 64 4 74	DL (μ g g ⁻¹) 0.008 2.450 0.015
Sc Ti V Cr	RV $(\mu g g^{-1})$ 0.74 3.61 1.01 1.19	AV $(\mu g g^{-1})$ 3.26 3.63 1.05 1.18 (.67)	DIF $(\mu g g^{-1})$ 2.52 0.02 0.04 0.01	20 μm DIF% (%) 340 0.5 4.1 1	SD (1σ) $(\mu g g^{-1})$ 0.613 0.908 0.125 0.274	RSD (%) 18.81 25.0 11.9 23.2	Sensitivity (cps/ µ g g ⁻¹) 108 6 127 12	DL $(\mu g g^{-1})$ 0.004 0.359 0.002 0.371 0.02	AV $(\mu g g^{-1})$ 3.78 3.67 0.94 1.02	DIF $(\mu g g^{-1})$ 3.04 0.06 0.07 0.17	10 μm DIF% (%) 411 <i>1.7</i> 7.36 <i>14</i>	SD (1σ) $(\mu g g^{-1})$ 0.495 1.639 0.246 0.782	RSD (%) 13.09 44.63 26.30 76.49	Sensitivity (cps/ µgg ⁻¹) 64 4 74 10	DL $(\mu g g^{-1})$ 0.008 2.450 0.015 1.300 2.272
Sc Ti V Cr Mn	RV $(\mu g g^{-1})$ 0.74 3.61 1.01 1.19 1.42 2.22	AV (μgg ⁻¹) 3.26 3.63 1.05 1.18 1.37	DIF (µgg ⁻¹) 2.52 0.02 0.04 0.01 0.05	20 μm DIF% (%) 340 0.5 4.1 1 4	SD (1σ) $(\mu g g^{-1})$ 0.613 0.908 0.125 0.274 0.128 0.127	RSD (%) 18.81 25.0 11.9 23.2 9.39	Sensitivity (cps/μgg ⁻¹) 108 6 127 12 131	DL $(\mu g g^{-1})$ 0.004 0.359 0.002 0.371 0.013 0.013	AV $(\mu g g^{-1})$ 3.78 3.67 0.94 1.02 1.6	DIF $(\mu g g^{-1})$ 3.04 0.06 0.07 0.17 0.2	10 μm DIF% (%) 411 <i>1.7</i> 7.36 <i>14</i> <i>12</i>	SD (1σ) (μ g g ⁻¹) 0.495 <i>1.639</i> 0.246 0.782 0.695	RSD (%) 13.09 44.63 26.30 76.49 43.66	Sensitivity $\frac{(cps/\mu g g^{-1})}{64}$ 4 74 10 77	DL (<u>µgg⁻¹)</u> 0.008 <i>2.450</i> 0.015 <i>1.300</i> 0.070
Sc Ti V Cr Mn Co	RV $(\mu g g^{-1})$ 0.74 3.61 1.01 1.19 1.42 0.79	AV (μgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70	DIF $(\mu g g^{-1})$ 2.52 0.02 0.04 0.01 0.05 0.09	20 μm DIF% (%) 340 0.5 4.1 1 4 11.2	SD (1 σ) (μg g ⁻¹) 0.613 0.908 0.125 0.274 0.128 0.127	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0	Sensitivity $(cps/\mu g g^{-1})$ 108 6 127 12 131 114	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010	AV $(\mu g g^{-1})$ 3.78 3.67 0.94 1.02 1.6 0.83	DIF $(\mu g g^{-1})$ 3.04 0.06 0.07 0.17 0.2 0.04	10 μm DIF% (%) 411 1.7 7.36 14 12 5.0	$SD (1 \sigma) (\mu g g^{-1}) 0.495 1.639 0.246 0.782 0.695 0.122$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66	Sensitivity (cps/ µg g ⁻¹) 64 4 74 10 77 67	DL (μgg ⁻¹) 0.008 2.450 0.015 1.300 0.070 0.015
Sc Ti V Cr Mn Co Ni	RV (μgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1	AV (μgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15	DIF $(\mu g g^{-1})$ 2.52 0.02 0.04 0.01 0.05 0.09 0.05	20 μm DIF% (%) 340 0.5 4.1 1 4 11.2 5	SD (1 σ) (μgg ⁻¹) 0.613 0.908 0.125 0.274 0.128 0.127 0.313	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1	Sensitivity (cps/µgg ⁻¹) 108 6 127 12 131 114 21	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010 0.454	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01	DIF $(\mu g g^{-1})$ 3.04 0.06 0.07 0.17 0.2 0.04 0.09	10 μm DIF% (%) 411 1.7 7.36 14 12 5.0 9	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\mathrm{gg}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.695 \\ 0.122 \\ 0.616 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 61.29	Sensitivity (cps/ µg g ⁻¹) 64 4 74 10 77 67 13	DL (μg g ⁻¹) 0.008 2.450 0.015 1.300 0.070 0.015 0.838
Sc Ti V Cr Mn Co Ni Zn	RV (μ_{gg}^{-1}) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79	AV (μgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88	DIF (μgg ⁻¹) 2.52 0.02 0.04 0.01 0.05 0.09 0.05 0.09	20 μm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\mathrm{gg}^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.313 \\ 0.427 \end{array}$	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1 14.8	Sensitivity (cps/ µ g g ⁻¹) 108 6 127 <i>12</i> <i>131</i> 114 <i>21</i> 7	DL (μgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40	$DIF (\mu g g^{-1})$ 3.04 0.06 0.07 0.17 0.2 0.04 0.09 0.39	10 μm DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\mathrm{gg}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.695 \\ 0.122 \\ 0.616 \\ 1.115 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 61.29 46.52	Sensitivity (cps/ µ g g ⁻¹) 64 4 74 10 77 67 67 13 3	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.070 0.015 0.838 4.396
Sc Ti V Cr Mn Co Ni Zn Rb	RV (μ_{gg}^{-1}) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855	AV (μg g ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85	$\begin{array}{c} \text{DIF} \\ (\mu_{\text{E},\text{g}}^{-1}) \\ 2.52 \\ 0.02 \\ 0.04 \\ 0.01 \\ 0.05 \\ 0.09 \\ 0.05 \\ 0.09 \\ 0.00 \end{array}$	20 μm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu \text{g g}^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.313 \\ 0.427 \\ 0.205 \end{array}$	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1 14.8 24.0	Sensitivity (cps/ µg g ⁻¹) 108 6 127 12 131 114 21 7 107	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.013 0.454 0.532 0.012	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79	$\begin{array}{c} \text{DIF} \\ (\mu \text{g g}^{-1}) \\ 3.04 \\ 0.06 \\ 0.07 \\ 0.17 \\ 0.2 \\ 0.04 \\ 0.09 \\ 0.39 \\ 0.07 \end{array}$	10 μm DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0	$\begin{array}{c} \text{SD} \ (1 \ \sigma) \\ (\mu_{g \ g}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.695 \\ 0.122 \\ 0.616 \\ 1.115 \\ 0.240 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 61.29 46.52 30.48	Sensitivity (cps/ µg g ⁻¹) 64 4 74 10 77 67 13 3 62	DL (μgg ⁻¹) 0.008 2.450 0.015 1.300 0.070 0.015 0.838 4.396 0.021
Sc Ti V Cr Mn Co Ni Zn Rb Sr	RV (<u>µgg⁻¹)</u> 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8	AV (μgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5	$\begin{array}{c} \text{DIF} \\ (\mu_{\text{gg}} \text{g}^{-1}) \\ 2.52 \\ 0.02 \\ 0.04 \\ 0.01 \\ 0.05 \\ 0.09 \\ 0.05 \\ 0.09 \\ 0.00 \\ 1.3 \end{array}$	20 μm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7	$ \begin{array}{c} \text{SD} (1\sigma) \\ (\mu_{\text{g g}}^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.313 \\ 0.427 \\ 0.205 \\ 1.132 \end{array} $	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1 14.8 24.0 2.54	Sensitivity (<u>(cps/ µ g g⁻¹)</u> 108 6 127 <i>12</i> 131 114 21 7 107 131	$\begin{array}{c} DL \\ (\mu_{B}{\rm g}^{-1}) \\ 0.004 \\ 0.359 \\ 0.002 \\ 0.371 \\ 0.013 \\ 0.010 \\ 0.454 \\ 0.532 \\ 0.012 \\ 0.003 \end{array}$	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8	DIF $(\mu_g g^{-1})$ 3.04 0.06 0.07 0.17 0.2 0.04 0.09 0.39 0.07 1.0	10 μm DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 2.2	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu g g^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.695 \\ 0.122 \\ 0.616 \\ 1.115 \\ 0.240 \\ 2.479 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 61.29 46.52 30.48 5.53	Sensitivity (cps/ µ g g ⁻¹) 64 74 70 77 67 13 3 62 76	DL $(\mu_{g}g^{-1})$ 0.008 2.450 0.015 1.300 0.070 0.015 0.838 4.396 0.021 0.01
Sc Ti V Cr Mn Co Ni Zn Sr Y	RV (µgg ⁻¹⁾) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79	AV (μg g ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.87	$\begin{array}{c} \text{DIF} \\ (\mu \underline{g} \underline{g}^{-1}) \\ 2.52 \\ 0.02 \\ 0.04 \\ 0.01 \\ 0.05 \\ 0.09 \\ 0.05 \\ 0.09 \\ 0.00 \\ 1.3 \\ 0.08 \end{array}$	20 μm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu \mathrm{g} \mathrm{g}^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.313 \\ 0.427 \\ 0.205 \\ 1.132 \\ 0.117 \end{array}$	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1 14.8 24.0 2.54 13.4	Sensitivity (cps/µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94	DIF $(\mu_{g}g^{-1})$ 3.04 0.06 0.07 0.17 0.2 0.04 0.09 0.39 0.07 1.0 0.15	10 µm DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu g g^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.695 \\ 0.122 \\ 0.616 \\ 1.115 \\ 0.240 \\ 2.479 \\ 0.346 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 61.29 46.52 30.48 5.53 37.02	Sensitivity (cps/µg g ⁻¹) 64 4 74 10 77 67 13 3 62 76 76 79	DL (μgg ⁻¹) 0.008 2.450 0.015 1.300 0.070 0.015 0.838 4.396 0.021 0.01 0.013
Sc Ti V Cr Mn Co Ni Zn Sr Y Zr	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848	AV (<u>µg g</u> ⁻¹) 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.87 0.94	$\begin{array}{c} \text{DIF} \\ (\mu_{g} g^{-1}) \\ 2.52 \\ 0.02 \\ 0.04 \\ 0.07 \\ 0.09 \\ 0.00 \\ 0.09 \\ 0.00 \\ 1.3 \\ 0.08 \\ 0.09 \end{array}$	20 μm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mugg^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.313 \\ 0.427 \\ 0.205 \\ 1.132 \\ 0.117 \\ 0.107 \end{array}$	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1 14.8 24.0 2.54 13.4 11.4	Sensitivity (cps/µgg ⁻¹) 108 6 127 <i>12</i> <i>131</i> 114 <i>21</i> 7 107 131 133 75	$\begin{array}{c} DL \\ (\mu_{\mathcal{B} \mathcal{B}}^{-1}) \\ 0.004 \\ 0.359 \\ 0.002 \\ 0.371 \\ 0.013 \\ 0.010 \\ 0.454 \\ 0.532 \\ 0.012 \\ 0.003 \\ 0.007 \\ 0.014 \end{array}$	AV (με g ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06	DIF (<u>µgg⁻¹)</u> 3.04 0.06 0.07 0.17 0.2 0.04 0.09 0.39 0.07 1.0 0.15 0.21	10 μm DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mugg^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.695 \\ 0.122 \\ 0.616 \\ 1.115 \\ 0.240 \\ 2.479 \\ 0.346 \\ 0.116 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 61.29 46.59 30.48 5.53 37.02 10.96	Sensitivity (cps/\mugg^{-1}) 64 4 74 10 77 67 13 3 62 76 79 42	DL (<u>µgg⁻¹</u>) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.01 0.013 0.030
Sc Ti V Cr Mn Co Ni Zn Sr Y Zr Nb	RV (<u>µgg⁻¹)</u> 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.79 0.848	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.87 0.94 0.87	DIF (µgg ⁻¹) 2.52 0.02 0.04 0.05 0.09 0.05 0.09 0.00 1.3 0.00 1.3 0.09 0.04	20 μm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu_{\text{B}\text{g}}^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.127 \\ 0.127 \\ 0.205 \\ 1.132 \\ 0.117 \\ 0.107 \\ 0.114 \end{array}$	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1 14.8 24.0 2.54 13.4 11.4 13.1	Sensitivity (<u>(cps/ µ g g⁻¹)</u> 108 6 127 <i>12</i> 131 114 21 7 107 131 133 75 145	$\begin{array}{c} DL \\ (\mu_{E}g^{-1}) \\ 0.004 \\ 0.359 \\ 0.002 \\ 0.371 \\ 0.013 \\ 0.010 \\ 0.454 \\ 0.532 \\ 0.012 \\ 0.003 \\ 0.007 \\ 0.014 \\ 0.003 \end{array}$	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84	DIF (<u>µgg⁻¹</u>) 3.04 0.06 0.07 0.2 0.04 0.09 0.07 1.0 0.17 0.2 0.07 1.0 0.21 0.02	10 μm DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu_{EE}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.696 \\ 0.122 \\ 0.616 \\ 1.175 \\ 0.122 \\ 0.616 \\ 1.175 \\ 0.240 \\ 0.240 \\ 0.240 \\ 0.274 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 61.29 46.52 30.48 5.53 37.02 10.96 32.63	Sensitivity (cps/ µ g g ⁻¹) 64 74 70 77 67 13 3 62 76 79 42 88	DL (<u>µgg</u> ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.013 0.013 0.030 0.012
Sc Ti V Cr Mn Co Ni Zr Sr Y Zr Nb Cs	RV (<u>µgg⁻¹)</u> 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 0.87 0.94 0.87 0.55	DIF (µgg ⁻¹) 2.52 0.04 0.04 0.05 0.05 0.09 0.05 0.09 0.05 0.09 0.00 1.3 0.08 0.08 0.04 0.11	20 µm DIF% (%) 340 0.5 4.1 7 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17	$\begin{array}{c} \text{SD} \ (1\sigma) \\ (\mu\mathrm{gg}^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.127 \\ 0.274 \\ 0.127 \\ 0.313 \\ 0.427 \\ 0.205 \\ 1.132 \\ 0.117 \\ 0.107 \\ 0.114 \\ 0.208 \end{array}$	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1 14.8 24.0 2.54 13.4 13.4 13.1 37.5	Sensitivity (cps/µgg ⁻¹) 108 6 127 12 131 133 7 107 131 133 75 145 165	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.0017	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.84	DIF (<u>µgg⁻¹</u>) 3.04 0.06 0.07 0.17 0.2 0.04 0.09 0.39 0.07 1.0 0.15 0.21 0.02 0.12	10 μm DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 2.2 18.40 25.07 1.85 18	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{B} g^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.616 \\ 1.115 \\ 0.240 \\ 0.616 \\ 1.115 \\ 0.2479 \\ 0.346 \\ 0.116 \\ 0.274 \\ 0.218 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 61.29 46.52 30.48 5.53 37.02 10.96 32.63 27.88	Sensitivity (cps/ µ g g ⁻¹) 64 74 10 77 67 13 3 62 76 79 42 88 88 89	DL (µgg ⁻¹) 0.008 2.450 0.015 0.070 0.015 0.021 0.01 0.011 0.013 0.030 0.012 0.018
Sc Ti V Cr Mn Co Ni n Rb r Y Z Nb Cs Ba	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.85 44.5 0.87 0.94 0.87 0.54 3.17	DIF (µgg ⁻¹) 2.52 0.04 0.04 0.05 0.09 0.05 0.09 0.00 1.3 0.08 0.09 0.04 0.10 0.08 0.09 0.04 0.01 0.03	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\mathrm{gg^{-1}}) \\ 0.613 \\ 0.08 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.205 \\ 1.132 \\ 0.427 \\ 0.205 \\ 1.132 \\ 0.117 \\ 0.107 \\ 0.114 \\ 0.206 \\ 0.296 \end{array}$	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1 14.8 24.0 2.54 13.4 11.4 13.4 11.4 13.7.5 9.36	Sensitivity (cps/µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20	$\begin{array}{c} DL \\ (\mu_{\mathcal{B},\mathcal{B}}^{-1}) \\ 0.004 \\ 0.359 \\ 0.002 \\ 0.371 \\ 0.013 \\ 0.010 \\ 0.454 \\ 0.532 \\ 0.012 \\ 0.003 \\ 0.007 \\ 0.014 \\ 0.003 \\ 0.017 \\ 0.036 \end{array}$	AV (μεε ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.84 0.84 3.17	DIF (µ g g ⁻¹) 3.04 0.06 0.07 0.17 0.2 0.04 0.09 0.39 0.07 1.0 0.15 0.21 0.02 0.12 0.02 0.03	10 μm DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 18 0.9	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\mathrm{gg}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.695 \\ 0.122 \\ 0.616 \\ 1.115 \\ 0.240 \\ 2.479 \\ 0.346 \\ 0.116 \\ 0.274 \\ 0.218 \\ 0.226 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 61.29 46.52 30.48 5.53 37.02 10.96 32.63 27.88 7.11	Sensitivity (cps/µgg ⁻¹) 64 4 74 10 77 67 13 3 62 76 79 42 88 89 12	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.070 0.015 0.838 4.396 0.021 0.01 0.013 0.013 0.012 0.018
Sc Ti V Cr Mn Co Ni Rb Y Zr Nb S B La	RV (<u>µgg⁻¹)</u> 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.85 44.5 0.85 44.5 0.87 0.94 0.87 0.55 3.17 0.72	DIF (µgg ⁻¹) 2.52 0.02 0.04 0.07 0.05 0.09 0.00 1.3 0.09 0.00 1.3 0.09 0.04 0.11 0.03 0.00	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.97 5.4 17 1.0 0.4	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu_{\text{B}\text{g}}^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.274 \\ 0.205 \\ 1.132 \\ 0.205 \\ 1.132 \\ 0.107 \\ 0.107 \\ 0.114 \\ 0.208 \\ 0.296 \\ 0.060 \end{array}$	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1 14.8 24.0 2.54 13.4 13.4 13.4 13.1 37.5 9.36 8.4	Sensitivity (cps/ µ g g ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159	$\begin{array}{c} DL \\ (\mu g g^{-1}) \\ 0.004 \\ 0.359 \\ 0.002 \\ 0.371 \\ 0.013 \\ 0.010 \\ 0.454 \\ 0.532 \\ 0.012 \\ 0.003 \\ 0.007 \\ 0.014 \\ 0.003 \\ 0.017 \\ 0.036 \\ 0.003 \end{array}$	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.78 3.17 0.82	DIF (µgg ⁻¹) 3.04 <i>0.06</i> 0.07 <i>0.17</i> <i>0.2</i> 0.04 <i>0.09</i> 0.07 1.0 0.15 0.21 0.02 <i>0.12</i> 0.02 <i>0.12</i> 0.02 <i>0.12</i> 0.02	10 µm DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 1.85 1.85 1.85 1.85 1.3.8	SD (1σ) (μ_{EE}^{-1}) 0.495 1.639 0.246 0.782 0.646 0.122 0.616 1.175 0.240 2.479 0.346 0.124 0.274 0.218 0.221	RSD (%) 13.09 44.63 26.30 76.49 43.66 61.29 46.52 30.48 5.53 37.02 10.96 32.63 27.88 7.11 14.77	Sensitivity (cps/µg g ⁻¹) 64 74 70 77 67 13 3 62 76 76 79 42 88 89 89 12 92	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.070 0.015 0.838 4.396 0.021 0.013 0.030 0.012 0.013 0.030 0.012 0.018 0.0010
Sc TiV Crn Co Ni Zr Nb Sa La Ce	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.813	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.87 0.94 4.5 0.87 0.55 3.17 0.75 0.71	$\begin{array}{c} \text{DIF} \\ (\mu g g^{-1}) \\ 2.52 \\ 0.04 \\ 0.04 \\ 0.05 \\ 0.05 \\ 0.05 \\ 0.09 \\ 0.05 \\ 0.09 \\ 0.005 \\ 0.09 \\ 0.011 \\ 0.03 \\ 0.04 \\ 0.11 \\ 0.03 \\ 0.00 \\ 0.10 \\ \end{array}$	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0 0.47 12.9	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\mathrm{gg}^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.213 \\ 0.427 \\ 0.203 \\ 1.132 \\ 0.117 \\ 0.107 \\ 0.114 \\ 0.208 \\ 0.296 \\ 0.060 \\ 0.090 \end{array}$	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1 14.8 24.0 2.54 13.4 13.4 13.4 13.4 13.4 13.4 13.7 5 9.36 8.4 12.77	Sensitivity (cps/µgg ⁻¹) 108 6 127 12 131 133 75 145 165 20 159 181	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.0017 0.036 0.003 0.002	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.78 3.17 0.82 0.72	DIF (µgg ⁻¹) 3.04 0.06 0.07 0.17 0.2 0.04 0.09 0.39 0.07 1.0 0.15 0.21 0.02 0.03 0.03 0.03 0.09	10 µm DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 18 0.9 13.85 11.2	SD (1σ) $(\mu_{gg})^{-1}$ 0.495 1.639 0.246 0.246 0.246 0.122 0.616 1.115 0.240 0.346 0.116 0.278 0.226 0.121 0.226	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 61.29 46.52 30.48 5.53 37.02 10.96 32.63 27.88 7.11 14.77 13.95	Sensitivity (cps/µg g ⁻¹) 64 74 10 77 67 13 3 62 76 76 79 42 88 88 89 12 92 108	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.01 0.013 0.013 0.013 0.012 0.018 0.096 0.0100
Sc TiV Crn Co i ZRb SrY Zr Nb Cs Ba La er	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.813 0.768	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.85 44.5 0.87 0.94 0.87 0.94 0.87 0.94 0.87 0.72 0.71 0.72 0.78	DIF (µgg ⁻¹) 2.52 0.04 0.05 0.09 0.05 0.09 0.05 0.09 0.00 1.3 0.08 0.09 0.04 0.13 0.08 0.09 0.04 0.10 0.01	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0 0.4 12.9 12	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\mathrm{gg}^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.313 \\ 0.427 \\ 0.205 \\ 1.132 \\ 0.205 \\ 1.132 \\ 0.117 \\ 0.107 \\ 0.114 \\ 0.206 \\ 0.900 \\ 0.035 \\ 0.035 \\ \end{array}$	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1 14.8 24.0 2.54 13.4 11.4 13.4 11.4 13.7.5 9.36 8.4 12.7.5 9.36	Sensitivity (cps/µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159 181 205	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.003 0.003 0.002 0.002	AV (μεε ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.84 0.84 0.78 3.17 0.82 0.72 0.84	DIF (µ g g ⁻¹) 3.04 0.06 0.07 0.17 0.2 0.09 0.39 0.07 1.0 0.15 0.21 0.02 0.12 0.03 0.10 0.03 0.10 0.07	10 µm DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 18 0.9 13.8 11.2 96	SD (1σ) (μ gg ⁻¹) 0.495 1.639 0.246 0.782 0.695 0.122 0.616 1.115 0.240 2.479 0.346 0.346 0.346 0.346 0.346 0.274 0.278 0.226 0.121 0.102	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 61.29 46.52 30.48 5.53 37.02 10.96 32.63 37.02 10.96 32.63 37.02 10.96 32.7.88 7.11 14.77 13.95 14.52	Sensitivity (cps/µgg ⁻¹) 64 4 74 10 77 67 13 3 62 76 79 42 88 89 12 92 108 117	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.015 0.015 0.015 0.015 0.021 0.01 0.013 0.021 0.013 0.030 0.012 0.018 0.096 0.006
Sc Ti V Cr Mn Co Ni Zn B Sr Y Zrb Cs Ba La Ce Pro	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.813 0.768 0.752	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.85 44.5 0.87 0.94 0.87 0.55 3.17 0.72 0.71 0.72 0.71 0.72 0.71 0.72	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.52 \\ 0.02 \\ 0.07 \\ 0.07 \\ 0.09 \\ 0.09 \\ 0.09 \\ 0.00 \\ 1.3 \\ 0.08 \\ 0.09 \\ 0.04 \\ 0.11 \\ 0.03 \\ 0.00 \\ 0.10 \\ 0.10 \\ 0.11 \\ 0.01 \\ 0.11 \\ 0.01 \\ 0.11 \\ 0.01 \\ 0.01 \\ 0.11 \\ 0.01 \\$	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 10.47 12.9 1	SD (1σ) $(\mu g g^{-1})$ 0.613 0.908 0.125 0.274 0.125 0.127 0.313 0.427 0.205 1.132 0.117 0.114 0.208 0.296 0.060 0.090 0.035 0.411	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1 14.8 24.0 2.54 13.4 11.4 13.1 37.5 9.36 8.4 12.77 4.5 22.9	Sensitivity (<u>(cps/ µ g g⁻¹)</u> 108 6 127 <i>12</i> 131 114 21 7 107 131 133 75 145 165 20 159 181 205 31	DL (<u>µgg⁻¹)</u> 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.002 0.002 0.002	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.78 3.17 0.82 0.72 0.84 0.66	DIF (µgg ⁻¹) 3.04 <i>0.06</i> 0.07 <i>0.17</i> <i>0.2</i> 0.04 <i>0.09</i> 0.07 1.0 0.15 0.21 0.02 <i>0.12</i> 0.02 <i>0.12</i> 0.02 <i>0.12</i> 0.03 0.10 0.09 0.09	10 µm DIF% (%) 411 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 1.85 1.85 1.8 0.9 13.8 11.2 9.6 12.0	SD (1σ) (μ_{EE}^{-1}) 0.495 1.639 0.246 0.782 0.616 1.115 0.247 0.2479 0.346 0.122 0.2479 0.346 0.121 0.221 0.221 0.121 0.122 0.121 0.218 0.221 0.121 0.218 0.221 0.122 0.121 0.218 0.221 0.122 0.122 0.125 0.245 0.246 0.246 0.246 0.246 0.122 0.246 0.247 0.246 0.246 0.122 0.247 0.247 0.246 0.247 0.247 0.246 0.247 0.247 0.246 0.247 0.246 0.122 0.247 0.246 0.122 0.247 0.247 0.246 0.122 0.247 0.247 0.247 0.247 0.247 0.226 0.274 0.274 0.274 0.226 0.122 0.122 0.122 0.127 0.247 0.274 0.274 0.274 0.122 0.122 0.122 0.127 0.274 0.274 0.127 0.127 0.274 0.127 0.127 0.127 0.127 0.274 0.127	RSD (%) 13.09 44.63 26.30 76.49 43.66 61.29 46.52 30.48 5.53 37.02 30.48 5.53 37.02 10.96 32.63 27.88 7.11 14.77 13.95 14.52	Sensitivity (cps/ µg g ⁻¹) 64 74 70 77 67 13 3 62 76 79 42 88 89 89 12 92 108 117 19	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.01 0.013 0.030 0.012 0.012 0.012 0.018 0.012 0.016 0.006 0.006
Sciiv Crnncoin Nin Bryzrbus Blacerdor Roman	RV (<u>µgg⁻¹)</u> 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.813 0.768 0.752 0.754	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 0.87 0.94 4.5 0.87 0.55 3.17 0.75 3.17 0.72 0.71 0.78 0.62 0.78	$\begin{array}{c} \text{DIF} \\ (\mu g g^{-1}) \\ 2.52 \\ 0.04 \\ 0.04 \\ 0.05 \\ 0.05 \\ 0.05 \\ 0.09 \\ 0.05 \\ 0.09 \\ 0.005 \\ 0.09 \\ 0.01 \\ 1.3 \\ 0.08 \\ 0.09 \\ 0.04 \\ 0.11 \\ 0.03 \\ 0.00 \\ 0.10 \\ 0.10 \\ 0.01 \\ 0.14 \\ 0.02 \\$	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0 0.47 10.97 5.4 17 1.2 18.1 12.9 1.2 18.1	$\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mathrm{gg}^{-1})\\ 0.613\\ 0.908\\ 0.125\\ 0.274\\ 0.128\\ 0.127\\ 0.205\\ 1.132\\ 0.117\\ 0.205\\ 1.132\\ 0.117\\ 0.107\\ 0.114\\ 0.208\\ 0.296\\ 0.060\\ 0.090\\ 0.035\\ 0.141\\ 0.246\\ 0.246\\ 0.901\\ 0.035\\ 0.141\\ 0.246\\ 0.246\\ 0.902\\ 0.035\\ 0.141\\ 0.246\\ 0.246\\ 0.902\\ 0.035\\ 0.141\\ 0.246\\ 0.246\\ 0.902\\ 0.035\\ 0.141\\ 0.246\\ 0.246\\ 0.902\\ 0.035\\ 0.141\\ 0.246\\ 0.246\\ 0.246\\ 0.902\\ $	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1 14.8 24.0 2.54 13.4 13.1 37.5 9.36 8.4 12.77 4.5 22.9 45.0	Sensitivity (cps/ µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159 181 205 31 26	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.0017 0.036 0.003 0.002 0.002 0.002 0.002	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.94 1.06 0.84 0.84 0.82 0.72 0.84 0.66	DIF $(\mu_{E}g^{-1})$ 3.04 0.06 0.07 0.17 0.24 0.04 0.09 0.39 0.07 1.0 0.15 0.21 0.02 0.12 0.03 0.10 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.12 0.03 0.12 0.03 0.12 0.03 0.12 0.03 0.12 0.02 0.12 0.03 0.12 0.02 0.12 0.03 0.15 0.21 0.02 0.03 0.15 0.21 0.02 0.03 0.15 0.21 0.02 0.05 0.15 0.21 0.02 0.05 0.15 0.21 0.02 0.02 0.03 0.07 0.15 0.21 0.02 0.03 0.07 0.15 0.21 0.02 0.03 0.02 0.03 0.07 0.15 0.02 0.03 0.07 0.15 0.02 0.03 0.07 0.12 0.02 0.03 0.02 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 0.03 0.02 0.03 0.02 0.03 0.03 0.02 0.03 0.09 0.03 0.02 0.04 0.09 0.02 0.04 0.09 0.02 0.09 0.07 0.02 0.09 0.07 0.09 0.07 0.02 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.15 0.09 0.07 0.09 0.07 0.18 0.09 0.07 0.18 0.09 0.07 0.18 0.09 0.07 0.18 0.09 0.18 0.09 0.18 0.18 0.09 0.18 0.18 0.09 0.18 0.18 0.18 0.09 0.18 0.18 0.18 0.18 0.09 0.18 0.1	10 µm DIF% (%) 411 1.7 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 18 0.9 13.88 11.2 9.6 12.0 22.07	SD (1σ) (μ_{EE}^{-1}) 0.495 1.639 0.246 0.246 0.246 0.122 0.616 1.115 0.240 0.415 0.2479 0.346 0.116 0.278 0.226 0.121 0.101 0.122 0.122 0.721 0.511	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 67.29 46.52 30.48 5.53 37.02 10.96 32.63 32.63 27.88 7.11 14.77 13.95 14.52 25.98	Sensitivity (cps/ µ g g ⁻¹) 64 74 10 77 67 13 3 62 76 79 42 88 89 12 92 108 117 18	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.011 0.013 0.013 0.013 0.012 0.018 0.096 0.010 0.006 0.006 0.006
Sc TiV Cr Mn Co Nin R Sr Y Zr Mb Sa La Ce Pr dd Mi	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.813 0.768 0.752 0.754 0.754	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.87 0.94 0.87 0.94 0.87 0.55 3.17 0.72 0.71 0.72 0.71 0.78 0.78 0.72 0.78 0.78 0.78 0.72 0.78 0.78 0.72 0.78 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.78 0.72 0.78 0.78 0.72 0.78 0.78 0.78 0.72 0.78 0.7	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.52 \\ 0.04 \\ 0.07 \\ 0.05 \\ 0.09 \\ 0.05 \\ 0.09 \\ 0.00 \\ 1.3 \\ 0.08 \\ 0.09 \\ 0.04 \\ 0.11 \\ 0.03 \\ 0.00 \\ 0.01 \\ 0.11 \\ 0.03 \\ 0.00 \\ 0.01 \\ 0.11 \\ 0.02 \\ 0.01 \\$	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0 0.4 12.9 18.1 2.8 19.2	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\mathrm{gg}^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.205 \\ 1.132 \\ 0.117 \\ 0.205 \\ 1.132 \\ 0.117 \\ 0.107 \\ 0.114 \\ 0.208 \\ 0.296 \\ 0.060 \\ 0.090 \\ 0.035 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\$	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 27.1 14.8 24.0 2.54 13.4 13.4 13.4 13.1 9.36 8.4 12.77 4.5 22.9 45.0 21.0	Sensitivity (cps/µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159 181 205 31 26	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.0017 0.036 0.003 0.002 0.002 0.002	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.84 0.78 3.17 0.82 0.72 0.84 0.66 0.57 0.72	DIF (µgg ⁻¹) 3.04 0.06 0.07 0.17 0.2 0.04 0.09 0.39 0.07 0.15 0.21 0.02 0.15 0.21 0.03 0.10 0.03 0.10 0.07 0.09 0.07 0.09 0.07	10 µm DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 9 14.07 8.0 2.2 18.46 25.07 1.85 18 0.9 13.8 11.2 9.6 12.0 23.97 6.2 2.2 12.0 23.97 6.2 2.5 12.0 2.5 12.0 2.5 12.0 2.5 12.0 2.5 12.0 2.5 12.0 2.5 12.0 2.5 13.8 12.5 13.8 12.5 13.8 14.5 13.8 12.5 13.8 14.5 14.5 15.5 1	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{\text{gg}}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.695 \\ 0.125 \\ 0.616 \\ 1.115 \\ 0.240 \\ 2.479 \\ 0.346 \\ 0.116 \\ 0.240 \\ 0.346 \\ 0.116 \\ 0.226 \\ 0.121 \\ 0.122 \\ 0.121 \\ 0.122 \\ 0.172 \\ 0.561 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 61.29 46.52 30.48 5.53 37.02 10.96 32.63 27.83 7.11 14.77 13.95 14.52 25.98 87.78	Sensitivity (cps/µgg ⁻¹) 64 4 74 10 77 67 13 3 62 76 79 42 88 89 12 92 108 117 18 15 60	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.01 0.013 0.013 0.013 0.013 0.013 0.013 0.010 0.016 0.096 0.096 0.006 0.009 0.009 0.012
Sci V Cr M Co N Z R B Sr Y Z R B La Cerrol Sm L Cerrol	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.813 0.768 0.752 0.754 0.752	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.85 44.5 0.85 44.5 0.87 0.94 0.87 0.53 1.17 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.73 0.72 0.73 0.72 0.73 0.72 0.73 0.72 0.73 0.72 0.73 0.72 0.73 0.72 0.73 0.72 0.73 0.72 0.73 0.72 0.73 0.72 0.73 0.72 0.73 0.72 0.73 0.72 0.73 0.72 0.7	DIF (µgg ⁻¹) 2.52 0.02 0.07 0.05 0.09 0.05 0.09 0.00 1.3 0.08 0.09 0.04 0.10 0.03 0.00 0.10 0.14 0.02 0.10	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0 0.4 12.9 1.2 18.1 2.8 13.3 1.2 3.3 1.2 3.3 1.2 3.3 1.2 3.3 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu_{\text{E}\text{g}}^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.313 \\ 0.427 \\ 0.205 \\ 1.132 \\ 0.117 \\ 0.205 \\ 1.132 \\ 0.117 \\ 0.107 \\ 0.114 \\ 0.296 \\ 0.060 \\ 0.090 \\ 0.035 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.349 \\ 0.141 \\ 0.247 \\ 0.247 \\ 0.257 \\ 0.$	RSD (%) 18.81 25.0 9.39 18.0 2.7.1 14.8 24.0 2.54 13.4 13.4 13.1 37.5 9.36 8.4 12.77 4.5 9.36 8.4 12.77 4.5 22.9 9.36 8.4	Sensitivity (cps/µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159 181 205 31 26 103 27	$\begin{array}{c} DL \\ (\mu g g^{-1}) \\ 0.004 \\ 0.359 \\ 0.002 \\ 0.371 \\ 0.013 \\ 0.010 \\ 0.454 \\ 0.532 \\ 0.012 \\ 0.003 \\ 0.001 \\ 0.003 \\ 0.007 \\ 0.014 \\ 0.003 \\ 0.0017 \\ 0.036 \\ 0.003 \\ 0.002 \\ 0.002 \\ 0.002 \\ 0.006 \\ 0.066 \\ 0.008 \\ 0.066 \\ 0.008 \end{array}$	AV (μεε ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.84 0.82 0.72 0.82 0.72 0.84 0.66 0.57 0.72	DIF (<u>µ g g⁻¹</u>) 3.04 0.06 0.07 0.2 0.04 0.09 0.39 0.07 1.0 0.15 0.21 0.02 0.12 0.02 0.13 0.03 0.10 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.01 0.02 0.02 0.02 0.02 0.02 0.02 0.02	10 μ m DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 18 0.9 13.8 11.2 9.6 23.97 6.2 19.55 19.55	SD (1σ) (μ gg ⁻¹) 0.495 1.639 0.246 0.782 0.695 0.122 0.616 1.115 0.240 2.479 0.346 0.116 0.274 0.240 0.274 0.226 0.121 0.101 0.226 0.121 0.101 0.226 0.121 0.101 0.226	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 61.29 46.52 30.48 5.53 37.02 10.96 32.63 27.88 7.11 14.77 13.95 14.52 25.98 87.78 37.27	Sensitivity (cps/µgg ⁻¹) 64 4 74 10 77 67 13 3 62 76 79 42 88 89 12 92 108 117 18 15 60 16	DL (<u>µgg⁻¹</u>) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.01 0.013 0.021 0.013 0.030 0.012 0.012 0.010 0.012 0.010 0.006 0.006 0.0096 0.005 0.0359 0.155
S T V Cr M Co N Z R S Y Z R D S B La Ce P R M M U G F	RV (<u>µgg⁻¹)</u> 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.664 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.763 0.770	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 0.87 0.87 0.55 3.17 0.75 3.17 0.75 0.71 0.78 0.62 0.87 0.87 0.87 0.87 0.71 0.78 0.62 0.87 0.87 0.71 0.78 0.62 0.87 0.87 0.71 0.78 0.62 0.78 0.87 0.71 0.78 0.75 0.71 0.78 0.87 0.75 0.71 0.75 0.87 0.87 0.75 0.71 0.75 0.87 0.87 0.75 0.87 0.75 0.87 0.75 0.87 0.75 0.71 0.75 0.87 0.87 0.75 0.87 0.75 0.87 0.75 0.71 0.75 0.87 0.75 0.71 0.75 0.87 0.75 0.87 0.77 0.75 0.87 0.77 0.75 0.87 0.77 0.75 0.87 0.77 0.75 0.87 0.77 0.75 0.87 0.77 0.75 0.87 0.77 0.75 0.87 0.77 0.77 0.77 0.78 0.87 0.78 0.87 0.78 0.87 0.77 0.78 0.87 0.71 0.78 0.87 0.77 0.78 0.87 0.77 0.78 0.87 0.78 0.87 0.77 0.78 0.87 0.77 0.78 0.87 0.77 0.78 0.87 0.78 0.87 0.78 0.87 0.78 0.87 0.78 0.87 0.78 0.87 0.78 0.87 0.78 0.87 0.78 0.87 0.78 0.87 0.78 0.87 0.78 0.87 0.87 0.78 0.87 0.87 0.87 0.87 0.78 0.87 0.87 0.87 0.87 0.78 0.87 0.87 0.87 0.87 0.78 0.87 0.87 0.87 0.87 0.87 0.87 0.78 0.87 0.8	DIF (µgg ⁻¹) 2.52 0.04 0.04 0.09 0.05 0.09 0.05 0.09 0.05 0.09 0.05 0.09 0.00 1.3 0.08 0.09 0.04 0.11 0.11 0.11 0.11 0.11 0.01 0.11 0.01 0.11 0.01	20 µm DIF% (%) 340 0.5 4.1 7 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0 0.4 12.9 1.2 18.1 2.8 13.3 13.71	SD (1σ) $(\mu g g^{-1})$ 0.613 0.908 0.125 0.274 0.127 0.213 0.427 0.203 1.132 0.117 0.107 0.114 0.208 0.296 0.600 0.035 0.141 0.343 0.427 0.313 0.427 0.226 0.125 0.127 0.113 0.127 0.117 0.117 0.117 0.117 0.117 0.117 0.117 0.117 0.117 0.117 0.117 0.117 0.117 0.117 0.117 0.117 0.117 0.117 0.114 0.208 0.296 0.090 0.035 0.141 0.1427 0.1417 0.1417 0.141 0.226 0.127 0.1417 0.12	RSD (%) 18.81 11.9 23.2 9.39 24.0 27.1 14.8 24.0 2.54 13.4 13.4 13.1 37.5 9.36 8.4 12.77 4.5 22.9 45.0 28.4 45.0 22.10 22.10 23.4 21.27 21.0 23.4 21.27 21.2	Sensitivity (cps/ µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159 181 205 31 205 31 26 103 27 17	DL (<u>µgg⁻¹)</u> 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.0017 0.036 0.002 0.002 0.0068 0.006 0.008 0.008 0.008	AV (μg g ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.78 3.17 0.82 0.72 0.84 0.66 0.57 0.72 0.90	DIF (µgg ⁻¹) 3.04 0.06 0.07 0.17 0.29 0.04 0.09 0.39 0.07 1.0 0.15 0.21 0.02 0.12 0.03 0.10 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.02 0.01 0.02 0.03 0.01 0.02 0.02 0.03 0.01 0.02 0.03 0.01 0.02 0.01 0.02 0.01 0.02 0.01 0.02 0.02	10 µm DIF% (%) 411 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.05 1.85 1.85 1.85 1.85 1.85 1.85 1.85 1.12 9.6 12.397 6.2 18.15 2.54 2.597 6.2 18.45 2.56 2.57 1	SD (1σ) (μ_{EE}^{-1}) 0.495 1.639 0.246 0.246 0.246 0.122 0.616 1.115 0.240 0.122 0.616 1.115 0.247 0.346 0.116 0.274 0.226 0.274 0.226 0.122 0.172 0.122 0.122 0.122 0.346 0.122 0.346 0.122 0.346 0.218 0.226 0.218 0.226 0.218 0.226 0.218 0.226 0.218 0.226 0.218 0.226 0.245 0.245 0.245 0.122 0.122 0.122 0.122 0.346 0.122 0.346 0.122 0.346 0.122 0.346 0.122 0.346 0.122 0.346 0.122 0.346 0.122 0.346 0.122 0.346 0.122 0.346 0.127 0.346 0.127 0.247 0.226 0.227 0.346 0.122 0.274 0.226 0.274 0.226 0.122 0.122 0.346 0.122 0.122 0.346 0.122 0.122 0.346 0.122 0.122 0.122 0.346 0.122 0.122 0.346 0.127 0.274 0.226 0.122 0.122 0.122 0.122 0.122 0.122 0.124 0.274 0.226 0.122 0.122 0.122 0.122 0.122 0.122 0.124 0.274 0.226 0.122 0.269 0.122 0.122 0.122 0.122 0.122 0.122 0.122 0.122 0.269 0.122	RSD (%) 13.09 44.63 26.30 76.49 43.66 61.29 46.52 30.48 5.53 37.02 10.96 32.63 27.88 7.11 14.77 13.95 14.52 25.98 87.78 87.72 42.88	Sensitivity (cps/µg g ⁻¹) 64 74 10 77 67 13 3 62 76 79 42 88 89 12 92 108 117 18 15 60 16	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.011 0.013 0.011 0.013 0.012 0.018 0.012 0.018 0.006 0.006 0.006 0.006 0.006 0.009 0.359 0.013 0.165
Sc TiV Crn McoNiZn BryZr Nb Salace Product Sub Gruessian Science Scien	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.848 0.664 3.2 0.72 0.813 0.768 0.752 0.754 0.770 0.763 0.763 0.763 0.763 0.763 0.763	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 0.85 0.87 0.94 0.87 0.55 3.17 0.72 0.71 0.72 0.71 0.78 0.62 0.87 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.87 0.72 0.72 0.72 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.72 0.78 0.75 0.72 0.78 0.75 0.72 0.78 0.85 0.85 0.85 0.87 0.72 0.78 0.78 0.72 0.78 0.87 0.72 0.78 0.78 0.85 0.85 0.85 0.85 0.85 0.85 0.87 0.72 0.78 0.78 0.78 0.78 0.78 0.78 0.85 0.87 0.78 0.78 0.87 0.78 0.87 0.78 0.87 0.78 0.87 0.78 0.87 0.78 0.87 0.87 0.78 0.87 0.78 0.87 0.87 0.78 0.87 0.87 0.87 0.78 0.87 0.87 0.87 0.78 0.87 0.87 0.87 0.78 0.87 0.87 0.87 0.87 0.78 0.87 0.8	DIF (µgg ⁻¹) 2.52 0.02 0.04 0.05 0.09 0.05 0.09 0.05 0.09 0.04 0.11 0.08 0.09 0.04 0.11 0.03 0.00 0.10 0.01 0.11 0.02 0.10 0.01 0.01	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0 0.4 17 1.0 0.4 12.2 18.1 2.8 13.371 11.41 0.05	$\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mathrm{gg}^{-1})\\ 0.613\\ 0.908\\ 0.125\\ 0.274\\ 0.128\\ 0.127\\ 0.313\\ 0.427\\ 0.313\\ 0.427\\ 0.208\\ 1.132\\ 0.117\\ 0.107\\ 0.114\\ 0.208\\ 0.296\\ 0.060\\ 0.035\\ 0.141\\ 0.349\\ 0.183\\ 0.247\\ 0.179\\ $	RSD (%) 18.81 11.9 23.2 9.39 18.0 2.54 13.4 13.4 13.1 13.7 5 9.36 8.4 4.5 2.59 4.5 2.59 4.5 2.29 4.5 2.29 4.5 2.29 4.5 2.29 4.5 2.29 4.5 2.29 4.5 2.29 4.5 2.29 2.29 2.29 2.29 2.29 2.29 2.29 2.	Sensitivity (cps/ µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159 181 205 31 205 31 205 31 26 103 27 175	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.0017 0.036 0.003 0.002 0.002 0.002 0.006 0.006 0.005 0.005	AV (με g ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.94 1.06 0.84 0.78 3.17 0.82 0.72 0.84 0.66 0.57 0.72 0.90 0.93	DIF (µgg ⁻¹) 3.04 0.07 0.17 0.2 0.04 0.09 0.39 0.07 1.0 0.15 0.21 0.02 0.12 0.03 0.10 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.14 0.05 0.14 0.05 0.14	10 µ m DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 9 14.07 8.0 2.2 18.46 25.07 1.85 12.0 23.97 6.2 18.15 26.43 20.21	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{g g} ^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.616 \\ 1.115 \\ 0.246 \\ 0.125 \\ 0.616 \\ 1.115 \\ 0.2479 \\ 0.346 \\ 0.116 \\ 0.274 \\ 0.346 \\ 0.126 \\ 0.121 \\ 0.026 \\ 0.121 \\ 0.122 \\ 0.172 \\ 0.541 \\ 0.269 \\ 0.387 \\ 0.140 \\ 0.170 \\ 0.561 \\ $	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 67.29 46.52 30.48 5.53 37.02 10.96 32.63 37.02 10.96 32.63 37.02 10.96 32.63 37.02 10.96 32.63 37.02 13.95 25.98 87.78 37.27 42.88 15.02	Sensitivity (cps/µgg ⁻¹) 64 74 10 77 67 73 3 62 76 76 79 42 88 89 12 92 108 117 18 15 60 16 103	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.013 0.013 0.013 0.013 0.012 0.018 0.096 0.006 0.0099 0.309 0.013 0.006 0.0099 0.313 0.165 0.007
Sc Ti V Cr M Co Nin R Sr Y Zr bl Sa La ce Pr bl SE Ld C by J	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.813 0.768 0.752 0.754 0.775 0.754 0.7739 0.739 0.746	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.85 44.5 0.87 0.94 0.87 0.94 0.87 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.87 0.87 0.87 0.87 0.72 0.72 0.72 0.72 0.72 0.72 0.87 0.87 0.87 0.72 0.72 0.72 0.72 0.87 0.87 0.87 0.87 0.72 0.72 0.72 0.72 0.87 0.87 0.87 0.87 0.72 0.72 0.72 0.72 0.87 0.82 0.8	DIF (µgg ⁻¹) 2.52 0.04 0.04 0.05 0.09 0.05 0.09 0.05 0.09 0.00 1.3 0.08 0.09 0.04 0.13 0.08 0.09 0.04 0.10 0.01 0.14 0.02 0.10 0.08 0.07	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0 0.4 12.9 1.2 18.1 2.8 13.3 13.71 11.41 8.95	$\begin{array}{c} \text{SD} \ (1\sigma) \\ (\mu_{\text{E}\text{g}}^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.313 \\ 0.427 \\ 0.205 \\ 1.132 \\ 0.427 \\ 0.205 \\ 1.132 \\ 0.427 \\ 0.205 \\ 1.131 \\ 0.427 \\ 0.205 \\ 1.131 \\ 0.427 \\ 0.131 \\ 0.247 \\ 0.131 \\ 0.241 \\ 0.241 \\ $	RSD (%) 18.81 25.0 9.39 18.0 2.54 13.4 13.4 13.4 13.4 13.7 5 9.36 8.4 12.77 4.5 9.36 8.4 12.77 4.5 22.9 45.0 21.0 28.4 21.8 16.1 16.1 21.8 21.8 21.8 21.9 21.9 21.9 21.9 21.9 21.9 21.9 21.9	Sensitivity (cps/µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159 181 205 31 26 103 27 175 43	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.007 0.036 0.003 0.002 0.002 0.008 0.006 0.008 0.006 0.005 0.020	AV (μεε ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.84 0.84 0.84 0.82 0.72 0.82 0.72 0.84 0.66 0.57 0.72 0.90 0.93 0.90	DIF (µ g g ⁻¹) 3.04 0.06 0.07 0.17 0.2 0.09 0.39 0.07 0.15 0.21 0.02 0.15 0.21 0.02 0.12 0.03 0.10 0.09 0.07 0.09 0.07 0.09 0.07 0.14 0.20 0.14 0.20 0.14 0.20	10 µ m DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 18 0.9 13.8 11.2 9.6 12.0 23.97 6.2 18.15 26.43 20.24	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{\text{E}\text{E}}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.695 \\ 0.246 \\ 0.782 \\ 0.695 \\ 0.246 \\ 0.116 \\ 0.240 \\ 0.346 \\ 0.116 \\ 0.274 \\ 0.346 \\ 0.116 \\ 0.274 \\ 0.226 \\ 0.121 \\ 0.101 \\ 0.122 \\ 0.172 \\ 0.541 \\ 0.261 \\ 0.172 \\ 0.541 \\ 0.287 \\ 0.140 \\ 0.150 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 61.29 46.52 30.48 5.53 37.02 10.96 32.63 27.88 7.11 14.77 13.95 14.52 25.98 87.78 37.27 42.88 87.78 37.27 42.88 815.02 16.71	Sensitivity (cps/µgg ⁻¹) 64 4 74 10 77 67 13 3 62 76 79 42 88 89 12 92 108 117 18 15 60 16 103 24	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.070 0.015 1.300 0.070 0.015 0.838 4.396 0.021 0.01 0.013 0.013 0.012 0.018 0.096 0.010 0.006 0.099 0.0359 0.013 0.165 0.007 0.007 0.007
Sc Ti V Cr M Co Ni n B Sr Y Zr b Sc Ba La Ce Pr b SE G B D Ho	RV (<u>µgg⁻¹)</u> 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.763 0.7746 0.749	AV (µ g g ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 0.87 0.94 0.87 0.55 3.17 0.72 0.71 0.78 0.62 0.71 0.78 0.62 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.88 0.87 0.88 0.87 0.87 0.88 0.87 0.70 0.71 0.78 0.87 0.75 0.71 0.78 0.87 0.75 0.71 0.78 0.87 0.75 0.71 0.78 0.87 0.75 0.71 0.78 0.87 0.71 0.78 0.87 0.71 0.78 0.87 0.71 0.78 0.87 0.71 0.78 0.87 0.71 0.78 0.87 0.71 0.78 0.87 0.71 0.78 0.87 0.71 0.78 0.87 0.71 0.78 0.87 0.78 0.87 0.71 0.78 0.87 0.87 0.71 0.78 0.87 0.71 0.78 0.87 0.87 0.87 0.71 0.78 0.87 0.88 0.87 0.87 0.87 0.87 0.88 0.87 0.87 0.87 0.88 0.87 0.87 0.87 0.88 0.87 0.87 0.87 0.88 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.88 0.87 0.88 0.89	$\begin{array}{c} \text{DIF} \\ (\mu g g^{-1}) \\ 2.52 \\ 0.04 \\ 0.01 \\ 0.05 \\ 0.09 \\ 0.05 \\ 0.09 \\ 0.05 \\ 0.09 \\ 0.00 \\ 1.3 \\ 0.08 \\ 0.09 \\ 0.04 \\ 0.11 \\ 0.03 \\ 0.00 \\ 0.04 \\ 0.11 \\ 0.03 \\ 0.00 \\ 0.10 \\ 0.10 \\ 0.10 \\ 0.10 \\ 0.10 \\ 0.10 \\ 0.07 \\ 0.14 \end{array}$	20 µm DIF% (%) 340 0.5 4.1 7 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0 0.4 12.9 1.2 18.1 2.8 13.3 13.71 11.41 8.95 18.93	$\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mathrm{gg}^{-1})\\ 0.613\\ 0.908\\ 0.125\\ 0.274\\ 0.125\\ 0.274\\ 0.127\\ 0.213\\ 0.427\\ 0.205\\ 1.132\\ 0.117\\ 0.107\\ 0.114\\ 0.208\\ 0.296\\ 0.600\\ 0.035\\ 0.141\\ 0.296\\ 0.600\\ 0.035\\ 0.141\\ 0.313\\ 0.247\\ 0.179\\ 0.131\\ 0.999\\ \end{array}$	RSD (%) 18.81 11.9 23.2 9.39 24.0 27.1 14.8 24.0 2.54 13.4 13.4 13.1 37.5 9.36 8.4 12.77 4.5 22.9 45.0 28.4 21.0 28.4 21.0 28.4 21.0 28.4 21.0 21.1 21.1 21.2 3.5 21.0 11.9 22.2 23.5 24.0 25.0 11.9 23.2 24.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0 25	Sensitivity (cps/ µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159 181 205 31 205 31 26 103 27 175 43 160	DL (<u>µ g g⁻¹)</u> 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.0017 0.036 0.002 0.002 0.068 0.066 0.008 0.005 0.020 0.020	AV (μg g ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.78 3.17 0.82 0.72 0.84 0.66 0.57 0.72 0.90 0.93 0.90 0.89	DIF (µgg ⁻¹) 3.04 0.06 0.07 0.17 0.29 0.04 0.09 0.39 0.07 1.0 0.15 0.21 0.02 0.12 0.03 0.10 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.012 0.03 0.012 0.03 0.012 0.03 0.012 0.03 0.012 0.03 0.012 0.03 0.012 0.02 0.010000000000	10 µm DIF% (%) 411 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 18 0.9 13.85 11.2 9.6 12.97 6.2 18.15 26.23 20.24 18.89 1.5 26.24 18.95 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{B g}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.616 \\ 1.115 \\ 0.246 \\ 0.122 \\ 0.616 \\ 1.115 \\ 0.247 \\ 0.346 \\ 0.116 \\ 0.274 \\ 0.226 \\ 0.274 \\ 0.226 \\ 0.121 \\ 0.101 \\ 0.122 \\ 0.172 \\ 0.541 \\ 0.269 \\ 0.387 \\ 0.140 \\ 0.150 \\ 0.114 \\ \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 61.29 46.52 30.48 5.53 37.02 10.96 32.63 27.88 7.11 14.72 25.98 87.78 87.78 13.95 14.52 25.98 87.72 42.88 15.02 16.71 12.85	Sensitivity (cps/ µ g g ⁻¹) 64 74 70 77 67 13 3 62 76 76 79 42 88 88 89 12 92 108 117 18 15 60 16 16 103 24 95	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.011 0.013 0.010 0.012 0.018 0.010 0.012 0.018 0.006 0.006 0.006 0.006 0.006 0.009 0.359 0.013 0.165 0.0041 0.041 0.041
Sc Ti V Cr M Co N Z Rb Sr Y Z Rb S B a C Pr d M S E G H b y Ho Er	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.762 0.752 0.768 0.752 0.768 0.752 0.763 0.763 0.763 0.739 0.746 0.749 0.74	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 0.87 0.94 0.87 0.55 3.17 0.72 0.71 0.72 0.71 0.78 0.62 0.78 0.87 0.87 0.87 0.82 0.83	DIF (µgg ⁻¹) 2.52 0.04 0.05 0.09 0.05 0.09 0.05 0.09 0.04 0.11 0.13 0.08 0.09 0.04 0.11 0.11 0.03 0.00 0.10 0.01 0.11 0.10 0.01 0.10 0.08 0.07 0.14 0.09	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0 0.47 10.97 5.4 17 1.0 0.4 12 18.1 2.8 13.3 13.71 11.41 8.93 12.37	$\begin{array}{c} \text{SD} \ (1\sigma)\\ (\mu\mathrm{gg}^{-1})\\ 0.613\\ 0.908\\ 0.125\\ 0.274\\ 0.128\\ 0.127\\ 0.313\\ 0.427\\ 0.205\\ 1.132\\ 0.117\\ 0.107\\ 0.114\\ 0.208\\ 0.296\\ 0.060\\ 0.090\\ 0.035\\ 0.141\\ 0.39\\ 0.183\\ 0.247\\ 0.179\\ 0.183\\ 0.247\\ 0.179\\ 0.131\\ 0.099\\ 0.121\\ \end{array}$	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 2.54 13.4 13.4 13.1 37.5 9.36 8.4 4.5 22.9 4.5 22.9 4.5 22.9 4.5 21.0 21.0 21.0 21.0 21.0 21.0 21.0 21.0	Sensitivity (cps/µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159 181 205 31 205 205 205 205 205 205 205 205 205 205	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.002 0.002 0.002 0.006 0.005 0.0000 0.000 0.00000 0.0000 0.0000 0.0000 0.000000	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.94 1.06 0.84 0.78 3.17 0.82 0.72 0.84 0.66 0.57 0.72 0.90 0.93 0.90 0.89 0.95	DIF (µ g g ⁻¹) 3.04 0.07 0.17 0.2 0.04 0.09 0.39 0.07 1.0 0.15 0.21 0.02 0.12 0.03 0.10 0.09 0.07 0.09 0.07 0.09 0.14 0.20 0.14 0.21	10 µ m DIF% (%) 411 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 12.0 23.97 6.2 18.15 26.43 20.24 18.89 28.23	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{\text{B}\text{g}}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.695 \\ 0.122 \\ 0.616 \\ 1.115 \\ 0.246 \\ 0.112 \\ 0.346 \\ 0.116 \\ 0.274 \\ 0.2479 \\ 0.346 \\ 0.116 \\ 0.274 \\ 0.226 \\ 0.121 \\ 0.122 \\ 0.172 \\ 0.541 \\ 0.269 \\ 0.387 \\ 0.140 \\ 0.150 \\ 0.114 \\ 0.230 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 67.29 46.52 30.48 5.53 37.02 10.96 32.63 37.02 10.96 32.63 37.02 10.96 32.63 37.02 10.96 32.63 37.02 10.96 87.78 87.78 37.27 42.88 15.02 16.71 12.85 24.25	$\begin{array}{r} \text{Sensitivity} \\ (cps/\mugg^{-1}) \\ 64 \\ 4 \\ 74 \\ 10 \\ 77 \\ 67 \\ 13 \\ 3 \\ 62 \\ 76 \\ 79 \\ 42 \\ 88 \\ 89 \\ 12 \\ 92 \\ 108 \\ 117 \\ 18 \\ 15 \\ 60 \\ 16 \\ 103 \\ 24 \\ 95 \\ 32 \\ \end{array}$	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.013 0.013 0.013 0.013 0.013 0.012 0.018 0.096 0.010 0.006 0.0099 0.359 0.015 0.007 0.015
Sc Ti V Cr M Co N Z R Sr Y Zr M S B La ce Pr d Sm La d b y o H e r m	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.768 0.752 0.754 0.77 0.763 0.739 0.746 0.739 0.749 0.749 0.732	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.85 44.5 0.87 0.94 0.87 0.94 0.87 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.71 0.87 0.83 0.83 0.83 0.83 0.83 0.87	DIF (µgg ⁻¹) 2.52 0.04 0.04 0.05 0.09 0.05 0.09 0.05 0.09 0.04 0.13 0.08 0.09 0.04 0.13 0.08 0.09 0.04 0.11 0.03 0.00 0.11 0.01 0.01 0.01 0.01	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0 0.4 12.9 18.1 2.8 13.37 13.71 11.41 8.95 18.93 12.37	$\begin{array}{c} \text{SD} \ (1\sigma) \\ (\mu\mathrm{gg}^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.205 \\ 1.132 \\ 0.205 \\ 1.132 \\ 0.205 \\ 1.133 \\ 0.427 \\ 0.205 \\ 1.131 \\ 0.090 \\ 0.035 \\ 0.141 \\ 0.349 \\ 0.183 \\ 0.247 \\ 0.179 \\ 0.131 \\ 0.099 \\ 0.121 \\ 0.110 \end{array}$	RSD (%) 18.81 25.0 9.39 18.0 2.54 11.9 23.2 9.39 2.7.1 14.8 24.0 2.54 13.4 11.4 13.1 37.5 9.36 8.4 12.77 45.0 21.0 28.4 21.8 16.1 11.09 23.2 24.4 21.8 16.1 11.9 23.2 24.4 21.8 16.1 11.9 23.2 24.4 24.5 24.5 24.5 24.5 24.5 24.5 24	Sensitivity (cps/µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159 181 205 31 26 103 27 175 43 160 55 55 173	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.002 0.002 0.002 0.008 0.006 0.008 0.066 0.008 0.066 0.008 0.005 0.020 0.004 0.0014 0.003	AV (μεε ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.66 0.57 0.90 0.93 0.90 0.88	DIF (µ g g ⁻¹) 3.04 0.06 0.07 0.17 0.2 0.09 0.39 0.07 0.15 0.21 0.02 0.12 0.03 0.10 0.09 0.07 0.09 0.07 0.09 0.18 0.07 0.09 0.07 0.12 0.03 0.10 0.07 0.12 0.03 0.11 0.02 0.12 0.03 0.07 0.12 0.03 0.07 0.12 0.03 0.01 0.01 0.02 0.01 0.02 0.01 0.02 0.01 0.02 0.01 0.02 0.02	10 μ m DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 18 1.2 9.6 12.0 23.97 6.2 18.45 26.43 20.24 18.83 19.99	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\mathrm{gg}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.695 \\ 0.125 \\ 0.616 \\ 1.115 \\ 0.240 \\ 2.479 \\ 0.346 \\ 0.116 \\ 0.274 \\ 0.346 \\ 0.116 \\ 0.274 \\ 0.226 \\ 0.121 \\ 0.122 \\ 0.121 \\ 0.122 \\ 0.541 \\ 0.226 \\ 0.121 \\ 0.150 \\ 0.140 \\ 0.150 \\ 0.140 \\ 0.230 \\ 0.149 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 61.29 46.52 30.48 5.53 37.02 10.96 32.63 27.88 7.11 14.77 13.95 14.52 25.98 87.78 37.27 42.88 87.78 37.27 42.88 87.78 37.27 42.88 87.78 37.27 42.88 87.78 37.27 42.88 87.78 37.27 42.88 87.78 37.27 42.88 87.78 37.27 42.88 87.78 37.27 42.88 87.78 37.27 42.88 87.78 37.27 42.88 87.78 37.27 42.88 87.78 37.27 42.88 87.78 37.27 42.88 87.78 37.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.27 42.88 87.88 87.27 42.88 87.88 87.88 87.27 42.88 87.88 87.27 42.88 87.78 87.27 42.88 87.27 42.88 87.27 42.88 87.27 42.88 87.78 87.27 42.88 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.78 87.27 42.88 87.78 15.92 15.92 15.92 15.93 15.92 15.92 15.92 15.93 15.92 15.93 15.93 15.93 15.95	Sensitivity (cps/µgg ⁻¹) 64 4 74 10 77 67 13 3 62 76 79 42 88 89 12 92 108 117 18 15 60 16 103 24 95 32 101	DL (<u>µgg⁻¹</u>) 0.008 2.450 0.015 7.300 0.015 0.838 4.396 0.021 0.01 0.013 0.021 0.013 0.021 0.013 0.012 0.012 0.012 0.010 0.006 0.0096 0.0096 0.006 0.0028
Sc Ti V Cr M Co N Z R B Y Z R D S B La Ce Pr d M B Ld G T D H Cr M B La Ce Pr d M B Ld G T D H Cr M B	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.763 0.776 0.746 0.749 0.746 0.749 0.742 0.777	AV (µ g g ⁻¹) 3.26 3.63 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 0.87 0.94 0.87 0.71 0.78 0.62 0.71 0.78 0.62 0.87 0.88 0.87 0.83 0.87 0.83 0.83 0.83 0.83 0.87 0.83 0.83 0.83 0.83 0.87 0.88	$\begin{array}{c} \text{DIF} \\ (\mu g g^{-1}) \\ 2.52 \\ 0.04 \\ 0.01 \\ 0.05 \\ 0.09 \\ 0.05 \\ 0.09 \\ 0.05 \\ 0.09 \\ 0.00 \\ 1.3 \\ 0.08 \\ 0.09 \\ 0.04 \\ 0.11 \\ 0.03 \\ 0.00 \\ 0.10 \\ 0.11 \\ 0.10 \\ 0.10 \\ 0.10 \\ 0.10 \\ 0.10 \\ 0.11 \\ 0.10 \\ 0.07 \\ 0.14 \\ 0.09 \\ 0.14 \\ 0.10 \\ 0.14 \\ 0.11 \\ 0.14 \\ 0.10 \\ 0.14 \\ 0.11 \\ 0.14 \\ 0.11 \\ 0.14 \\ 0.11 \\ 0.14 \\ 0.11 \\ 0.14 \\ 0.14 \\ 0.11 \\ 0.14 \\ 0.10 \\ 0.14 \\ 0.14 \\ 0.10 \\ 0.14 \\ 0.14 \\ 0.10 \\ 0.14 \\ 0.14 \\ 0.14 \\ 0.14 \\ 0.14 \\ 0.14 \\ 0.1$	20 µm DIF% (%) 340 0.5 4.1 7 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0 0.4 12.9 1.2 18.1 2.8 13.3 13.71 11.41 8.95 18.93 12.37 19.03 13.2	$\begin{array}{c} \text{SD} (1\sigma)\\ (\mugg^{-1})\\ 0.613\\ 0.908\\ 0.125\\ 0.274\\ 0.125\\ 0.274\\ 0.127\\ 0.274\\ 0.127\\ 0.117\\ 0.127\\ 0.114\\ 0.208\\ 0.296\\ 0.600\\ 0.035\\ 0.141\\ 0.208\\ 0.296\\ 0.600\\ 0.035\\ 0.141\\ 0.349\\ 0.183\\ 0.247\\ 0.179\\ 0.131\\ 0.099\\ 0.121\\ 0.138\\ \end{array}$	RSD (%) 18.81 11.9 23.2 9.39 18.0 27.1 14.8 24.0 2.54 13.4 11.4 13.7 5 9.36 8.4 12.77 4.5 22.9 9.36 8.4 12.77 4.5 22.9 9.38 4 10.2 8.4 12.71 12.71 12.75 9.36 13.4 11.9 12.75 9.36 13.4 11.9 12.75 9.36 13.4 11.9 12.75 9.36 13.4 11.9 12.75 9.36 13.4 11.9 12.75 9.36 13.4 11.9 12.75 9.36 13.4 11.9 12.75 13.4 11.9 12.75 13.4 11.9 12.75 13.4 11.9 12.75 13.4 11.9 12.75 13.4 11.9 12.75 13.4 11.9 12.75 13.4 11.9 12.75 13.4 11.9 12.75 13.4 11.9 12.75 13.4 11.9 12.75 12.75 13.4 11.9 12.75 12.75 12.75 13.4 11.9 12.75	Sensitivity (cps/ µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159 181 205 31 26 103 27 175 43 160 55 173 35	DL (<u>µ g g⁻¹)</u> 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.0017 0.036 0.002 0.002 0.0068 0.006 0.005 0.020 0.004 0.005	AV (μg g ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.78 3.17 0.82 0.72 0.84 0.66 0.57 0.72 0.90 0.93 0.90 0.89 0.95 0.88 0.80	DIF (µgg ⁻¹) 3.04 0.06 0.07 0.17 0.29 0.04 0.09 0.39 0.07 1.0 0.15 0.12 0.03 0.10 0.02 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.012 0.03 0.012 0.03 0.012 0.03 0.012 0.03 0.012 0.03 0.012 0.03 0.012 0.02 0.010000000000	10 µm DIF% (%) 411 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 18 0.9 13.85 11.2 9.6 12.97 6.2 18.15 26.43 20.24 18.89 28.23 19.99 3.0	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{B g}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.616 \\ 1.115 \\ 0.246 \\ 0.122 \\ 0.616 \\ 1.115 \\ 0.247 \\ 0.346 \\ 0.122 \\ 0.346 \\ 0.274 \\ 0.274 \\ 0.274 \\ 0.226 \\ 0.121 \\ 0.101 \\ 0.122 \\ 0.172 \\ 0.541 \\ 0.269 \\ 0.387 \\ 0.140 \\ 0.150 \\ 0.114 \\ 0.230 \\ 0.150 \\ 0.527 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 61.29 46.52 30.48 5.53 37.02 10.96 32.63 27.88 7.11 14.72 25.98 87.78 87.78 87.77 42.88 15.02 16.71 12.85 24.25 16.95 16.93	Sensitivity (cps/ μ g g ⁻¹) 64 4 74 10 77 67 13 3 62 76 79 42 88 89 12 92 108 117 18 15 60 16 103 24 95 32 101 22	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.011 0.013 0.011 0.013 0.012 0.018 0.012 0.018 0.096 0.0106 0.006 0.009 0.359 0.013 0.165 0.001 0.041 0.028 0.004
Sc Ti V Cr M Co N Z R Sr Y Zr M S B La ce Pr Nd M E U d D y to Fr M b Lu	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.763 0.779 0.746 0.749 0.749 0.749 0.740 0.749 0.742 0.777 0.732	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.87 0.94 0.87 0.55 3.17 0.72 0.71 0.72 0.71 0.78 0.62 0.78 0.87 0.87 0.87 0.82 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.83 0.87 0.82 0.87 0.82 0.87 0.87 0.87 0.87 0.55 0.87 0.72 0.72 0.72 0.72 0.72 0.72 0.72 0.87 0.83 0.83 0.83 0.83 0.88 0.8	$\begin{array}{c} \text{DIF} \\ (\mugg^{-1}) \\ 2.52 \\ 0.02 \\ 0.04 \\ 0.07 \\ 0.05 \\ 0.09 \\ 0.05 \\ 0.09 \\ 0.05 \\ 0.09 \\ 0.00 \\ 1.3 \\ 0.08 \\ 0.09 \\ 0.04 \\ 0.11 \\ 0.13 \\ 0.00 \\ 0.10 \\ 0.01 \\ 0.11 \\ 0.14 \\ 0.02 \\ 0.10 \\ 0.14 \\ 0.09 \\ 0.14 \\ 0.15 \\ 0.15 \\ \end{array}$	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0 0.47 10.97 5.4 17 1.0 0.47 10.97 5.4 17 1.2 18.1 2.9 1.2 18.1 2.9 13.3 13.71 11.41 8.95 18.93 12.37 19.03 13.22 20.38	$\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mathrm{gg}^{-1})\\ 0.613\\ 0.908\\ 0.125\\ 0.274\\ 0.128\\ 0.127\\ 0.213\\ 0.427\\ 0.205\\ 1.132\\ 0.427\\ 0.208\\ 0.427\\ 0.107\\ 0.114\\ 0.208\\ 0.296\\ 0.060\\ 0.090\\ 0.035\\ 0.141\\ 0.296\\ 0.060\\ 0.095\\ 0.141\\ 0.35\\ 0.141\\ 0.35\\ 0.141\\ 0.35\\ 0.141\\ 0.099\\ 0.121\\ 0.110\\ 0.099\\ 0.121\\ 0.110\\ 0.042\\ \end{array}$	RSD (%) 18.81 25.0 11.9 23.2 9.39 18.0 23.2 9.36 18.0 24.0 2.54 13.4 13.4 13.1 13.7 5 9.36 8.4 4.5 22.9 45.0 21.0 28.4 21.0 28.4 21.0 28.4 21.0 11.0 9.36 1.0 1.0 9.36 1.0 9.36 1.0 9.37 2.54 1.0 9.36 2.54 1.0 9.37 2.54 1.0 9.36 2.54 1.0 9.37 2.54 1.0 9.39 2.54 1.0 9.39 2.54 2.54 1.0 9.39 2.54 1.0 9.39 2.54 2.54 1.0 9.39 2.54 2.54 2.54 2.54 1.0 9.36 2.55 2.55 2.55 2.55 2.55 2.55 2.55 2.5	Sensitivity (cps/µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 105 20 159 181 205 31 205 31 205 31 205 31 205 31 205 55 113 35 161	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.0017 0.036 0.002 0.002 0.006 0.005 0.020 0.004 0.003 0.0014 0.003	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.78 3.17 0.82 0.72 0.84 0.66 0.57 0.72 0.90 0.93 0.90 0.89 0.95 0.88 0.94	DIF (µ g g ⁻¹) 3.04 0.07 0.17 0.2 0.04 0.09 0.39 0.07 1.0 0.15 0.21 0.02 0.12 0.03 0.10 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.02 0.01 0.02 0.03 0.01 0.02 0.03 0.01 0.02 0.03 0.01 0.02 0.03 0.01 0.02 0.02 0.03 0.01 0.02 0.02 0.02 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 0.05 0.05 0.05 0.05 0.05 0.05 0.05	10 µ m DIF% (%) 411 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 18 0.9 13.8 0.9 13.8 11.2 9.6 12.0 23.97 6.2 18.15 26.43 20.24 18.15 26.43 20.24 18.89 28.23 19.99 3.0 27.78	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{B \text{g}}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.616 \\ 1.115 \\ 0.246 \\ 0.122 \\ 0.616 \\ 1.115 \\ 0.2479 \\ 0.346 \\ 0.116 \\ 0.274 \\ 0.226 \\ 0.121 \\ 0.122 \\ 0.172 \\ 0.387 \\ 0.140 \\ 0.150 \\ 0.114 \\ 0.230 \\ 0.149 \\ 0.527 \\ 0.116 \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 67.29 46.52 30.48 5.53 37.02 10.96 32.63 37.02 10.96 37.02 10.96 37.02 10.96 37.02 10.96 37.02 10.96 37.02 10.95 37.02 10.96 37.02 10.95 37.02 10.95 53 37.02 10.95 53 37.02 10.95 53 53 53 53 53 53 53 52 53 53 52 53 53 52 52 53 52 52 53 52 52 52 52 52 52 52 52 52 52 52 52 52	Sensitivity (cps/µg g ⁻¹) 64 74 10 77 67 13 3 62 76 79 42 88 89 12 92 108 117 18 15 60 16 103 24 95 32 101 22 93	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.01 0.013 0.013 0.013 0.013 0.012 0.016 0.006 0.009 0.0099 0.013 0.0165 0.007 0.013 0.0165 0.007 0.011 0.010 0.028 0.006 0.099
Sc Ti V Cr M Co N Z R Sr Y Zr M S B La Ce Pr M Sn Eu dd Tb Y O H Er m b L Hf	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.813 0.768 0.752 0.754 0.752 0.754 0.763 0.763 0.763 0.763 0.739 0.746 0.749 0.74 0.732 0.777 0.732 0.711	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.87 0.94 0.87 0.55 3.17 0.72 0.71 0.72 0.71 0.72 0.71 0.72 0.78 0.82 0.83 0.83 0.83 0.83 0.83 0.83 0.83 0.85 0.83 0.83 0.85 0.83 0.85 0.83 0.85 0.85 0.85 0.85 0.85 0.85 0.87 0.72 0.72 0.72 0.72 0.83 0.85 0.85 0.85 0.85 0.87 0.72 0.72 0.72 0.83 0.83 0.85 0.85 0.85 0.87 0.72 0.72 0.83 0.83 0.85 0.85 0.85 0.87 0.72 0.72 0.83 0.83 0.83 0.85 0.85 0.85 0.87 0.72 0.72 0.83 0.83 0.85 0.85 0.87 0.72 0.87 0.87 0.87 0.72 0.78 0.87 0.87 0.87 0.72 0.78 0.87 0.87 0.87 0.72 0.78 0.87 0.87 0.87 0.72 0.78 0.87 0.87 0.87 0.87 0.72 0.78 0.87 0.87 0.87 0.87 0.87 0.78 0.87 0.82 0.83 0.83 0.83 0.88 0.72	DIF (µgg ⁻¹) 2.52 0.02 0.04 0.05 0.09 0.05 0.09 0.00 1.3 0.08 0.09 0.04 0.13 0.08 0.09 0.04 0.11 0.03 0.00 0.11 0.03 0.00 0.01 0.01	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 10.47 10.97 5.4 10.47 10.97 5.4 10.47 10.97 5.4 11.41 8.95 13.371 11.41 8.95 18.95 12.37 19.03 13.2 20.38 1.5	$\begin{array}{c} \text{SD} \ (1\sigma) \\ (\mu\mathrm{gg}^{-1}) \\ 0.613 \\ 0.908 \\ 0.125 \\ 0.274 \\ 0.128 \\ 0.127 \\ 0.313 \\ 0.427 \\ 0.205 \\ 1.132 \\ 0.117 \\ 0.107 \\ 0.14 \\ 0.208 \\ 0.296 \\ 0.060 \\ 0.090 \\ 0.035 \\ 0.141 \\ 0.296 \\ 0.060 \\ 0.090 \\ 0.035 \\ 0.141 \\ 0.349 \\ 0.133 \\ 0.247 \\ 0.179 \\ 0.131 \\ 0.090 \\ 0.121 \\ 0.110 \\ 0.138 \\ 0.042 \\ 0.153 \\ \end{array}$	RSD (%) 18.81 25.0 9.39 18.0 2.54 13.4 11.4 2.54 13.4 13.1 7.5 9.36 8.4 12.77 4.5 22.9 45.0 21.0 28.4 21.8 16.1 11.09 14.6 12.6 4.8 21.2	Sensitivity (cps/µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159 181 205 31 26 103 27 175 43 31 26 103 27 175 43 160 55 55 173 35 161 48	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.002 0.002 0.008 0.006 0.008 0.006 0.005 0.000 0.005 0.020 0.004 0.003 0.004 0.003 0.005 0.002	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.79 44.8 0.94 1.06 0.84 0.72 0.84 0.66 0.57 0.72 0.84 0.66 0.57 0.72 0.90 0.93 0.90 0.95 0.88 0.94 0.95	DIF (µgg ⁻¹) 3.04 0.06 0.07 0.17 0.2 0.04 0.09 0.39 0.07 1.0 0.15 0.21 0.02 0.15 0.21 0.03 0.10 0.09 0.07 0.09 0.18 0.07 0.09 0.18 0.07 0.14 0.20 0.14 0.21 0.21 0.21 0.20 0.14 0.20 0.20 0.20 0.20 0.20 0.20 0.20 0.2	10 µ m DIF% (%) 411 1.7 7.36 14 12 5.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 13.8 112 9.6 12.0 23.97 6.2 18.46 12.0 23.97 6.2 18.15 26.43 20.24 18.25 18.25 19.0 19.0 12.0 23.97 6.2 18.15 26.43 20.24 18.25 19.99 3.0 27.786 19.99 3.0 27.786 19.99 3.0 27.786 19.99 3.0 27.786 19.99 3.0 27.786 19.99 3.0 27.786 19.99 3.0 27.786 19.99 3.0 27.786 19.99 3.0 27.786 19.99 3.0 27.786 19.99 3.0 27.786 19.99 3.0 27.786 19.99 3.0 27.786 19.99 3.0 27.786 28.456 28.237 19.99 3.0 27.786 28.456 28.4577 28.4577 28.4577 28.45777 28.45777777777777777777777777777777777777	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu\text{gg}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.695 \\ 0.125 \\ 0.695 \\ 0.116 \\ 0.240 \\ 2.479 \\ 0.346 \\ 0.116 \\ 0.240 \\ 2.479 \\ 0.346 \\ 0.116 \\ 0.224 \\ 0.226 \\ 0.121 \\ 0.012 \\ 0.122 \\ 0.121 \\ 0.122 \\ 0.172 \\ 0.541 \\ 0.264 \\ 0.122 \\ 0.172 \\ 0.541 \\ 0.226 \\ 0.121 \\ 0.101 \\ 0.226 \\ 0.121 \\ 0.122 \\ 0.551 \\ 0.140 \\ 0.150 \\ 0.114 \\ 0.230 \\ 0.149 \\ 0.527 \\ 0.116 \\ 0.207 \\ \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 67.29 46.52 30.48 5.53 37.02 10.96 32.63 27.88 7.11 14.77 13.95 24.25 14.52 25.98 87.78 37.27 42.88 15.02 16.71 12.85 16.95 16.95 16.95 12.45 16.95	Sensitivity (cps/µgg ⁻¹) 64 4 74 10 77 67 73 3 62 76 79 42 88 89 12 92 108 117 18 15 60 16 103 24 95 32 101 22 93 28	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.01 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.010 0.006 0.099 0.359 0.0165 0.007 0.041 0.028 0.028 0.028 0.028 0.028
Sc Ti V Cr M Co N Z R Sr Y Zr M Sc B La Ce Pr M Sm U d H D Ho Er M b Lu H Ta	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.855 45.8 0.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.813 0.768 0.752 0.752 0.754 0.776 0.746 0.749 0.746 0.749 0.746 0.749 0.746 0.749 0.746 0.777 0.732 0.777 0.732 0.771 0.808	AV (µgg ⁻¹) 3.26 3.63 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 0.87 0.94 0.87 0.55 3.17 0.72 0.71 0.78 0.62 0.78 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.88 0.87 0.88 0.88 0.88 0.87 0.88 0.87 0.70 0.70 0.70 0.70 0.70 0.70 0.70 0.70 0.70 0.70 0.70 0.70 0.70 0.70 0.70 0.71 0.78 0.87 0.71 0.78 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.87 0.88 0.8	$\begin{array}{c} \text{DIF} \\ (\mu_{\text{gg}}^{-1}) \\ 2.52 \\ 0.04 \\ 0.01 \\ 0.05 \\ 0.09 \\ 0.05 \\ 0.09 \\ 0.05 \\ 0.09 \\ 0.00 \\ 1.3 \\ 0.08 \\ 0.09 \\ 0.04 \\ 0.13 \\ 0.00 \\ 1.3 \\ 0.00 \\ 1.3 \\ 0.00 \\ 1.3 \\ 0.00 \\ 1.3 \\ 0.00 \\ 1.3 \\ 0.00 \\ 1.3 \\ 0.00 \\ 1.3 \\ 0.00 \\ 1.3 \\ 0.00 \\ 1.3 \\ 0.00 \\ 1.3 \\ 0.00 \\ 1.3 \\ 0.00 \\ 0.11 \\ 0.01 \\ 0.10 \\ 0.14 \\ 0.01 \\ 0.15 \\ 0.01 \\ 0.07 \\ 0.14 \\ 0.07 \\ 0.07 \\ 0.07 \\ 0.07 \\ 0.07 \\ 0.07 \\ 0.00 \\ $	20 µm DIF% (%) 340 0.5 4.1 7 4 11.2 5 3.30 0.25 2.7 10.47 10.47 10.47 10.47 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2	$\begin{array}{c} \text{SD} (1\sigma)\\ (\mugg^{-1})\\ 0.613\\ 0.908\\ 0.125\\ 0.274\\ 0.125\\ 0.274\\ 0.127\\ 0.274\\ 0.127\\ 0.274\\ 0.127\\ 0.127\\ 0.127\\ 0.112\\ 0.117\\ 0.102\\ 0.427\\ 0.132\\ 0.117\\ 0.114\\ 0.208\\ 0.296\\ 0.060\\ 0.035\\ 0.141\\ 0.296\\ 0.035\\ 0.141\\ 0.349\\ 0.133\\ 0.247\\ 0.179\\ 0.131\\ 0.099\\ 0.131\\ 0.099\\ 0.131\\ 0.099\\ 0.131\\ 0.099\\ 0.131\\ 0.099\\ 0.131\\ 0.099\\ 0.131\\ 0.110\\ 0.138\\ 0.042\\ 0.153\\ 0.168\\ \end{array}$	RSD (%) 18.81 11.9 23.2 9.39 18.0 27.1 14.8 24.0 27.1 14.8 9.36 8.4 13.4 13.1 37.5 9.36 8.4 12.77 4.5 22.9 9.36 8.4 12.77 4.5 22.9 9.36 11.9 12.7 12.7 12.7 10 21.4 21.0 21.0 21.0 21.0 21.0 21.0 21.0 21.0	Sensitivity (<u>(cps/ µ g g⁻¹)</u> 108 6 127 <i>12</i> 131 114 21 7 7 107 131 133 75 145 165 20 159 181 205 31 26 103 27 175 43 160 55 55 173 35 161 48 171	DL (<u>µ g g⁻¹)</u> 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.002 0.002 0.002 0.008 0.002 0.008 0.006 0.005 0.020 0.004 0.003 0.004 0.003 0.004 0.003	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.78 3.17 0.82 0.72 0.84 0.66 0.57 0.72 0.90 0.93 0.90 0.89 0.95 0.88 0.80 0.94 0.95 0.88 0.80	DIF (µgg ⁻¹) 3.04 0.06 0.07 0.17 0.2 0.04 0.09 0.07 1.0 0.15 0.21 0.02 0.12 0.03 0.10 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.01 0.02 0.01 0.05 0.14 0.20 0.15 0.15 0.15 0.15 0.15 0.15 0.20 0.02 0.02 0.02 0.05	10 µm DIF% (%) 411 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 18 0.9 13.8 11.2 9.6 12.0 23.97 6.2 18.15 26.43 20.24 18.89 28.23 19.99 3.0 27.78 4.96 5.88	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{\text{E}\text{E}}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.616 \\ 1.175 \\ 0.240 \\ 0.122 \\ 0.616 \\ 1.175 \\ 0.240 \\ 0.122 \\ 0.641 \\ 0.274 \\ 0.274 \\ 0.274 \\ 0.274 \\ 0.274 \\ 0.274 \\ 0.274 \\ 0.274 \\ 0.274 \\ 0.269 \\ 0.387 \\ 0.140 \\ 0.527 \\ 0.116 \\ 0.527 \\ 0.116 \\ 0.207 \\ 0.117 \\ \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 61.29 46.52 30.48 5.53 37.02 10.96 32.63 27.88 7.11 14.72 25.98 7.11 14.52 25.98 87.78 37.27 42.88 15.02 16.71 12.85 24.25 16.95 17.95 16.95 16.95 17.95 16.95 16.95 17.95 17.95 16.95 17.95 1	Sensitivity (cps/ µ g g ⁻¹) 64 74 70 77 67 13 3 62 76 79 42 88 89 12 92 108 117 18 15 60 16 103 24 95 32 101 22 93 28 100	DL (µ g g ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.011 0.013 0.021 0.013 0.012 0.012 0.018 0.012 0.016 0.006 0.099 0.013 0.065 0.007 0.041 0.010 0.028
Sc Ti > Cr M Co N Z Rb Sr Y Zr bb Sg La Ce Pr bb Sg La Cd Fb D Ho Fr M bb Lu Ff a Pb	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.712 0.768 0.752 0.754 0.77 0.763 0.739 0.746 0.749 0.749 0.746 0.749 0.746 0.777 0.732 0.711 0.808 2.32	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 4.4.5 0.87 0.94 4.5 0.87 0.55 3.17 0.72 0.71 0.78 0.62 0.78 0.87 0.87 0.87 0.87 0.87 0.82 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.83 0.83 0.87 0.82 0.83 0.83 0.87 0.88 0.83 0.83 0.87 0.88 0.83 0.83 0.87 0.82 0.83 0.87 0.82 0.83 0.83 0.87 0.82 0.83 0.8	DIF (µgg ⁻¹) 2.52 0.04 0.05 0.09 0.05 0.09 0.05 0.09 0.04 0.11 0.08 0.09 0.04 0.11 0.03 0.00 0.10 0.01 0.10 0.01 0.10 0.01 0.14 0.09 0.14 0.09 0.14 0.09 0.15 0.01 0.05 0.01 0.05 0.01 0.05 0.04 0.05 0.05 0.05 0.05 0.05 0.05	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 17 1.0 97 5.4 17 1.0 97 5.4 17 1.2 18.1 17 1.2 18.1 17 1.2 18.1 17 1.2 18.1 17 1.2 18.1 17 1.2 18.1 17 1.2 18.1 17 1.2 17 10.97 5.4 17 1.2 17 10.97 5.4 17 10.97 5.4 17 10.97 5.4 10.97 5.4 17 10.97 5.4 10.97	$\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mathrm{gg}^{-1})\\ 0.613\\ 0.908\\ 0.125\\ 0.274\\ 0.125\\ 0.274\\ 0.127\\ 0.205\\ 1.132\\ 0.117\\ 0.107\\ 0.114\\ 0.208\\ 0.296\\ 0.000\\ 0.035\\ 0.141\\ 0.208\\ 0.296\\ 0.060\\ 0.090\\ 0.035\\ 0.141\\ 0.318\\ 0.247\\ 0.179\\ 0.131\\ 0.099\\ 0.121\\ 0.110\\ 0.138\\ 0.042\\ 0.153\\ 0.642\\ 0.314\\ \end{array}$	RSD (%) 18.81 25.0 23.2 9.39 23.2 9.39 23.2 9.36 24.0 27.1 14.8 24.0 27.1 14.8 23.5 4 13.4 13.1 37.5 9.36 8.4 21.2 22.9 45.0 28.4 21.0 28.4 21.0 28.4 21.0 28.4 21.0 28.4 21.0 28.4 21.0 28.4 21.0 28.4 21.0 28.4 11.9 23.2 24.5 24.5 24.5 24.5 24.5 24.5 24.5 24	Sensitivity (cps/ µ g g ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159 181 205 31 207 207 207 207 207 207 207 207 207 207	DL (µgg ⁻¹) 0.004 0.359 0.002 0.371 0.013 0.010 0.454 0.532 0.012 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.007 0.014 0.003 0.002 0.002 0.002 0.002 0.002 0.006 0.005 0.020 0.004 0.003 0.005 0.020 0.004 0.003 0.003 0.005 0.020 0.004 0.005 0.020 0.004 0.005 0.020 0.004 0.005 0.020 0.005 0.020 0.005 0.020 0.005 0.020 0.005 0.020 0.005 0.020 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.002 0.005 0.002 0.002 0.005 0.002 0.002 0.002 0.003 0.002 0.002 0.002 0.002 0.003 0.002 0.002 0.003 0.002 0.002 0.002 0.002 0.003 0.002 0.002 0.003 0.002 0.003 0.002 0.003 0.002 0.003 0.002 0.003 0.001 0.003 0.002 0.003 0.001 0.003 0.002 0.003 0.002 0.003 0.002 0.003 0.002 0.003 0.002 0.003 0.003 0.002 0.003 0.002 0.003 0.002 0.003 0.002 0.003 0.002 0.003 0.002 0.003 0.002 0.003 0.002 0.003 0.002 0.003 0.002 0.003 0.005 0.003 0.005 0.003 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.003 0.005 0.003 0.005 0.003 0.005 0.003 0.005 0.003 0.005 0.003 0.003 0.005 0.003 0.003 0.005 0.003 0.003 0.003 0.005 0.004 0.003 0.003 0.005 0.004 0.003 0.003 0.004 0.003 0.002 0.004 0.003 0.005 0.004 0.003 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.003 0.004 0.003 0.003 0.004 0.003 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.004 0.003 0.004	AV (μgg ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 0.94 1.06 0.84 0.57 0.72 0.84 0.66 0.57 0.72 0.90 0.93 0.90 0.89 0.95 0.88 0.80 0.94 0.95 0.88 0.80 0.94 0.95 0.88 0.80 0.94 0.95 0.88 0.80 0.94 0.95 0.88 0.80 0.90 0.95 0.88 0.90 0.95 0.90 0.90 0.95 0.90 0.95 0.90 0.95 0.90 0.95 0.90 0.95 0.90 0.95 0.90 0.95 0.90 0.95 0.90 0.90	DIF (µ g g ⁻¹) 3.04 0.07 0.17 0.2 0.04 0.09 0.39 0.07 1.0 0.15 0.21 0.02 0.12 0.03 0.10 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.09 0.07 0.02 0.01 0.02 0.01 0.07 0.02 0.01 0.02 0.01 0.02 0.01 0.02 0.02	10 µ m DIF% (%) 411 7.36 14 12 5.0 9 14.07 8.0 2.2 18.46 25.07 1.85 18 0.9 13.88 11.2 9.6 12.0 23.97 6.2 18.15 26.43 20.24 18.89 28.23 19.99 3.0 27.78 4.96 5.88 14.48	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{B E}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.616 \\ 1.115 \\ 0.246 \\ 0.122 \\ 0.616 \\ 1.115 \\ 0.2479 \\ 0.346 \\ 0.116 \\ 0.274 \\ 0.226 \\ 0.121 \\ 0.101 \\ 0.122 \\ 0.172 \\ 0.526 \\ 0.387 \\ 0.140 \\ 0.150 \\ 0.387 \\ 0.140 \\ 0.269 \\ 0.387 \\ 0.140 \\ 0.269 \\ 0.387 \\ 0.140 \\ 0.522 \\ 0.116 \\ 0.207 \\ 0.116 \\ 0.207 \\ 0.116 \\ 0.207 \\ 0.500 \\ \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 67.29 46.52 30.48 5.53 37.02 10.96 32.63 27.88 7.11 14.77 13.95 14.52 25.98 87.78 87.78 87.78 87.78 87.77 42.88 15.02 16.71 12.85 24.25 16.95 12.45 26.583 12.45 27.69 13.71 25.18	Sensitivity (cps/ µ g g ⁻¹) 64 4 74 10 77 67 13 3 62 76 79 42 88 89 12 92 108 117 18 15 60 16 103 24 95 32 101 22 93 28 100 46	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.011 0.013 0.013 0.013 0.012 0.018 0.096 0.010 0.006 0.099 0.359 0.013 0.013 0.013 0.006 0.0013 0.0165 0.007 0.028 0.009 0.010 0.028 0.009 0.010 0.028
SCTIV CM CON Z R SY Z N SB Lace P N SEL G T D H E T M L L H T A P T	RV (µgg ⁻¹) 0.74 3.61 1.01 1.19 1.42 0.79 1.1 2.79 0.855 45.8 0.79 0.848 0.824 0.664 3.2 0.72 0.848 0.664 3.2 0.72 0.752 0.754 0.752 0.754 0.770 0.763 0.768 0.752 0.754 0.774 0.763 0.746 0.742 0.7410 0.746 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.7410 0.742 0.7410 0.7410 0.7410 0.742 0.7410 0.7410 0.7410 0.7410 0.7410 0.742 0.7410 0.7410 0.742 0.7410 0.7410 0.742 0.7410 0.7410 0.742 0.7410 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.742 0.7410 0.7420 0.74100 0.74200000000000000000000000000000000000	AV (µgg ⁻¹) 3.26 3.63 1.05 1.18 1.37 0.70 1.15 2.88 0.85 44.5 0.87 0.94 0.87 0.94 0.87 0.55 3.17 0.72 0.71 0.72 0.71 0.72 0.78 0.62 0.78 0.87 0.82 0.83 0.83 0.87 0.83 0.85 0.85 0.85 0.85 0.87 0.72 0.87 0.82 0.83 0.85 0.85 0.87 0.82 0.83 0.83 0.85 0.83 0.85 0.85 0.85 0.87 0.87 0.72 0.78 0.87 0.82 0.83 0.83 0.85 0.83 0.85 0.85 0.87 0.82 0.83 0.83 0.85 0.85 0.83 0.85 0.85 0.87 0.82 0.83 0.83 0.85 0.83 0.85 0.85 0.87 0.82 0.83 0.8	DIF (µgg ⁻¹) 2.52 0.02 0.04 0.05 0.09 0.05 0.09 0.05 0.09 0.00 1.3 0.08 0.09 0.04 0.13 0.08 0.09 0.04 0.11 0.03 0.00 0.11 0.01 0.01 0.01 0.01	20 µm DIF% (%) 340 0.5 4.1 1 4 11.2 5 3.30 0.25 2.7 10.47 10.97 5.4 10.47 10.97 5.4 10.47 10.97 5.4 10.47 10.97 5.4 11.4 12.8 13.371 11.41 8.95 18.93 12.37 19.03 13.2 20.38 1.5 8.9 6.4 10.4	$\begin{array}{c} \text{SD} (1\sigma)\\ (\mu\mathrm{gg}^{-1})\\ 0.613\\ 0.908\\ 0.125\\ 0.274\\ 0.128\\ 0.127\\ 0.313\\ 0.427\\ 0.313\\ 0.427\\ 0.208\\ 0.132\\ 0.117\\ 0.107\\ 0.114\\ 0.208\\ 0.296\\ 0.060\\ 0.900\\ 0.035\\ 0.141\\ 0.208\\ 0.296\\ 0.060\\ 0.035\\ 0.141\\ 0.349\\ 0.183\\ 0.247\\ 0.179\\ 0.131\\ 0.099\\ 0.121\\ 0.110\\ 0.138\\ 0.042\\ 0.153\\ 0.168\\ 0.316\\ $	RSD (%) 18.81 25.0 9.39 9.32 9.32 9.32 9.32 9.32 24.0 2.54 13.4 13.4 13.1 13.7 5 9.36 8.4 4.5 22.9 4.5 22.9 4.5 22.9 4.5 21.0 21.0 21.4 4.5 12.77 4.5 22.9 4.5 21.0 21.4 4.5 21.0 21.4 4.5 21.0 21.4 4.5 21.0 21.4 21.4 21.5 21.5 21.5 21.5 21.5 21.5 21.5 21.5	Sensitivity (cps/µgg ⁻¹) 108 6 127 12 131 114 21 7 107 131 133 75 145 165 20 159 181 205 31 205 31 205 31 205 31 205 55 173 35 161 48 171 81 30	$\begin{array}{c} DL \\ (\mu_{B~B}^{-1}) \\ 0.004 \\ 0.359 \\ 0.002 \\ 0.371 \\ 0.013 \\ 0.010 \\ 0.454 \\ 0.532 \\ 0.012 \\ 0.003 \\ 0.007 \\ 0.014 \\ 0.003 \\ 0.007 \\ 0.014 \\ 0.003 \\ 0.001 \\ 0.003 \\ 0.002 \\ 0.066 \\ 0.008 \\ 0.066 \\ 0.008 \\ 0.066 \\ 0.008 \\ 0.066 \\ 0.008 \\ 0.006 \\ 0.000 \\ 0.0014 \\ 0.003 \\ 0.0014 \\ 0.003 \\ 0.0014 \\ 0.003 \\ 0.004 \\ 0.004 \\ 0.002 \\ 0.004 \\ 0.003 \\ 0.005 \\ 0.005 \\ 0.005 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.005 \\ 0.008 \\ 0.0$	AV (με g ⁻¹) 3.78 3.67 0.94 1.02 1.6 0.83 1.01 2.40 0.79 44.8 0.94 1.06 0.84 4.78 3.17 0.82 0.72 0.84 0.66 0.57 0.72 0.90 0.93 0.90 0.93 0.95 0.88 0.80 0.94 0.75 0.88 1.98 0.81	DIF (µ g g ⁻¹) 3.04 0.07 0.17 0.2 0.04 0.09 0.39 0.07 1.0 0.15 0.21 0.02 0.15 0.21 0.03 0.10 0.09 0.10 0.09 0.10 0.09 0.11 0.02 0.03 0.07 0.09 0.14 0.20 0.15 0.14 0.21 0.15 0.21 0.07 0.07 0.07 0.07 0.07 0.21 0.02 0.03 0.07 0.07 0.02 0.03 0.07 0.02 0.03 0.07 0.02 0.03 0.03 0.07 0.02 0.03 0.03 0.07 0.02 0.03 0.03 0.03 0.07 0.02 0.03 0.03 0.03 0.03 0.07 0.02 0.03 0.03 0.03 0.07 0.02 0.03 0.03 0.07 0.02 0.03 0.03 0.03 0.03 0.07 0.02 0.03 0.03 0.03 0.07 0.02 0.03 0.03 0.07 0.02 0.03 0.03 0.07 0.02 0.03 0.07 0.02 0.03 0.07 0.02 0.03 0.07 0.02 0.03 0.03 0.07 0.02 0.03 0.07 0.02 0.03 0.07 0.02 0.03 0.07 0.02 0.03 0.07 0.02 0.03 0.07 0.02 0.03 0.07 0.03 0.07 0.03 0.07 0.04 0.03 0.07 0.05 0.05 0.04 0.05 0.05 0.05 0.05 0.04 0.05 0.07 0.05 0.05 0.04 0.05 0.07 0.05 0.05 0.01 0.05 0.07 0.05 0.07 0.05 0.07 0.07 0.05 0.03 0.07 0.05 0.07 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.05 0.010 0.05 0.05	10 µ m DIF% (%) 411 7.36 14 12 5.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 14.07 8.0 9 13.8 11.2 9.6 12.0 23.97 6.2 18.15 26.43 20.27 18.15 26.43 20.27 18.15 26.43 20.27 18.15 26.43 20.27 18.15 26.43 20.27 18.15 26.43 20.27 18.15 26.43 20.27 18.99 3.0 27.78 4.96 5.88 14.880 27.78 4.96 5.888 14.880	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu_{\text{g g}}^{-1}) \\ 0.495 \\ 1.639 \\ 0.246 \\ 0.782 \\ 0.695 \\ 0.125 \\ 0.616 \\ 1.115 \\ 0.240 \\ 0.479 \\ 0.346 \\ 0.116 \\ 0.274 \\ 0.2479 \\ 0.346 \\ 0.116 \\ 0.226 \\ 0.121 \\ 0.122 \\ 0.172 \\ 0.541 \\ 0.226 \\ 0.121 \\ 0.122 \\ 0.387 \\ 0.140 \\ 0.150 \\ 0.140 \\ 0.150 \\ 0.114 \\ 0.230 \\ 0.149 \\ 0.527 \\ 0.116 \\ 0.207 \\ 0.117 \\ 0.500 \\ 0.160 \\ \end{array}$	RSD (%) 13.09 44.63 26.30 76.49 43.66 14.66 67.29 46.52 30.48 5.53 37.02 10.96 32.63 37.02 10.96 32.63 37.02 10.96 32.63 37.02 10.96 32.63 37.02 10.96 32.63 37.02 14.52 25.98 87.78 42.88 15.02 16.71 12.88 15.02 16.95 65.83 12.45 26.95 65.83 12.45 27.69 13.71 25.16 96 88 7.11	Sensitivity (cps/\mugg^{-1}) 64 4 74 10 77 67 13 3 62 76 79 42 88 89 12 92 108 117 18 15 60 16 103 24 95 32 101 22 93 28 100 46 78	DL (µgg ⁻¹) 0.008 2.450 0.015 1.300 0.015 0.838 4.396 0.021 0.01 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.010 0.006 0.009 0.359 0.010 0.006 0.007 0.011 0.010 0.028 0.006 0.028 0.006 0.028 0.006 0.028 0.006 0.005 0.001 0.015 0.006 0.010 0.015 0.006 0.010 0.015 0.006 0.015 0.006 0.015 0.006 0.015 0.015 0.015 0.015 0.015 0.015 0.015 0.015 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0006 0.0010 0.0016 0.00100 0.00100000000

RV: reference value of Jochum *et al.* (2011), AV: averaged value of analytical result, DIF: difference from reference value, DIF%: percentage of DIF against RV, SD: standard deviation of analytical values, RSD: relative standard deviation of analytical values, LD: lower limits of detection.

*Values shown by Italic are reference values. Because of low background-signal count ratio, results of those elements were not determined in several sets, thus those values were extrapolated from other sets of analyses (N=5).



Fig. 6 DIF % of the Ca-normalized values determined for different pit diameters from the reference values of NIST 615 by Jochum *et al.* (2011). (a) Elemental Set 1 (34 elements) and (b) elemental Set 2 (27 elements). See text for detailed discussion.

Table 6 Quantitative results of replicate analyses (N=5) for NIST 615 determined using four pit diameters (80, 40, 20, and 10 μ m) by elemental Set 2.

				80 µ/m							40 μm				
	RV	AV	DIF	DIF%	SD(1σ)	RSD	Sensitivity	DL	AV	DIF	DIF%	SD (1σ)	RSD	Sensitivity	DL
	$(\mu g g^{-1})$	$(\mu g g^{-1})$	$(\mu g g^{-1})$	(%)	$(\mu g g^{-1})$	(%)	$(cps/\mu gg^{-1})$	(µgg ⁻¹)	$(\mu g g^{-1})$	$(\mu g g^{-1})$	(%)	(µgg ⁻¹)	(%)	$(cps/\mu gg^{-1})$	(μgg ⁻¹)
Sc	0.74	2.18	1.44	195	0.084	3.85	1318	0.001	3.30	2.56	347	0.191	5.77	307	0.001
V	1.01	1.02	0.01	0.53	0.042	4.15	1537	0.001	0.99	0.02	1.64	0.064	6.4	332	0.002
Rb	0.855	0.84	0.01	1.42	0.067	7.97	1579	0.001	0.86	0.00	0.2	0.041	4.8	288	0.001
Sr	45.8	46.4	0.6	1.22	1.608	3.47	1939	0.000	46.2	0.4	0.81	1.281	2.77	356	0.001
Y	0.79	0.89	0.10	12.05	0.029	3.31	1931	0.000	0.84	0.05	5.9	0.079	9.42	392	0.001
Zr	0.848	0.95	0.10	11.58	0.033	3 44	1017	0.001	0.95	0.10	12.2	0.084	8.83	202	0.002
Nh	0.824	0.80	0.02	2 4 2	0.042	5 1 9	2062	0.000	0.85	0.03	3.34	0.078	9.2	402	0.001
Ba	3.2	3.12	0.02	2 4 9	0.148	474	318	0.003	3 10	0.00	3 18	0.278	8 97	52	0.013
La	0.72	0.72	0.00	2.10	0.019	2 5 5	2432	0.000	0.10	0.10	11 34	0.051	6 3 9	429	0.001
Ce	0.813	0.76	0.05	6.4	0.015	4 57	2931	0.000	0.00	0.00	5.8	0.121	15.8	471	0.001
Pr	0.768	0.70	0.00	0.7	0.000	2 55	3063	0.000	0.75	0.00	2 32	0.083	11.05	532	0.001
Nd	0.752	0.79	0.00	5 38	0.020	10 14	501	0.000	0.70	0.02	89	0.000	11.00	87	0.001
Sm	0.754	0.75	0.06	8 56	0.000	13.00	416	0.002	0.02	0.07	19.0	0.169	18.02	73	0.015
Eu	0.754	0.02	0.00	3 10	0.107	2 05	150/	0.002	0.03	0.14	5 70	0.100	17.00	285	0.013
Gd	0.763	0.75	0.02	/ 01	0.025	7.05	/10	0.001	0.73	0.04	73	0.130	15.1	205	0.002
Th	0.703	0.00	0.04	9.31	0.030	2.62	2602	0.002	0.02	0.00	1/1.0	0.124	0.04	100	0.011
	0.739	0.01	0.07	3.15	0.021	2.03	2093	0.000	0.84	0.11	14.0	0.070	10.60	450	0.001
Dy L	0.740	0.77	0.03	0.01	0.030	1.51	2565	0.001	0.80	0.12	10.0	0.092	7 26	115	0.004
П0 Г.,	0.749	0.01	0.00	0.21	0.012	1.01 6.0E	2000	0.000	0.89	0.14	0.4	0.005	14.0	4/1	0.000
Er T	0.74	0.63	0.09	11.01	0.037	0.60	009	0.001	0.01	0.07	9.0	0.115	14.Z	101 E01	0.003
IM	0.732	0.77	0.03	4.72	0.023	3.05	2/1/	0.000	0.76	0.03	4.4	0.046	0.96	501	0.001
Yb	0.777	0.80	0.02	2.76	0.065	8.18	593	0.001	0.80	0.02	3.1	0.072	9.0	105	800.0
Lu	0.732	0.76	0.02	3.40	0.013	1.76	2623	0.000	0.80	0.06	8.8	0.045	5.63	465	0.001
Ht	0.711	0.76	0.05	6.99	0.044	5.82	/62	0.001	0.79	0.08	10.8	0.094	11.94	141	0.005
Та	0.808	0.80	0.01	1.10	0.023	2.86	2758	0.000	0.79	0.02	2.58	0.081	10.34	498	0.001
Pb	2.32	2.37	0.05	2.08	0.070	2.97	1323	0.001	2.03	0.29	12.61	0.173	8.52	238	0.001
١h	0.748	0.79	0.04	5.54	0.031	3.97	21//	0.000	0.84	0.09	12.40	0.039	4.61	384	0.001
U	0.823	0.82	0.00	0.21	0.032	3.91	2959	0.000	0.72	0.10	12.11	0.045	6.20	508	0.001
-															
				00							10				
			DIE	20 μm	0D (1 m)	DOD	0				10 μm	CD (1 m)	DOD	0	
	RV	AV	DIF	20 μm DIF%	SD (1 σ)	RSD	Sensitivity	DL	AV	DIF	<u>10 μm</u> DIF%	SD (1 σ)	RSD	Sensitivity	DL
	RV $(\mu g g^{-1})$	ΑV (μgg ⁻¹)	DIF $(\mu g g^{-1})$	20 μm DIF% (%)	SD (1σ) $(\mu g g^{-1})$	RSD (%)	Sensitivity (cps/ μ gg ⁻¹)	$\frac{DL}{(\mu g g^{-1})}$	ΑV (μgg ⁻¹)	DIF $(\mu g g^{-1})$	<u>10 μm</u> DIF% (%)	$SD(1\sigma)$ $(\mu g g^{-1})$	RSD (%)	Sensitivity (cps/ μ gg ⁻¹)	$DL (\mu g g^{-1})$
Sc	RV ($\mu g g^{-1}$) 0.74	ΑV (μgg ⁻¹) 2.89	DIF ($\mu g g^{-1}$) 2.15	20 μm DIF% (%) 291	SD (1 σ) (μ g g ⁻¹) 0.507	RSD (%) 17.52	Sensitivity (cps/ μ gg ⁻¹) 109	DL $(\mu g g^{-1})$ 0.004	$\frac{AV}{(\mu g g^{-1})}$ 3.68	DIF (μ g g ⁻¹) 2.94	<u>10 μm</u> DIF% (%) 397	SD (1 σ) (μ g g ⁻¹) 0.792	RSD (%) 21.53	Sensitivity (cps/ μ gg ⁻¹) 60	DL (μ g g ⁻¹) 0.018
Sc V	RV $(\mu g g^{-1})$ 0.74 1.01	AV (µgg ⁻¹) 2.89 0.95	DIF ($\mu g g^{-1}$) 2.15 0.06	20 μm DIF% (%) 291 5.52	SD (1σ) $(\mu g g^{-1})$ 0.507 0.116	RSD (%) 17.52 12.14	Sensitivity (cps/μgg ⁻¹) 109 130	DL (μ gg ⁻¹) 0.004 0.006	AV ($\mu g g^{-1}$) 3.68 0.99	DIF ($\mu g g^{-1}$) 2.94 0.02	10 μm DIF% (%) 397 2.35	SD (1σ) $(\mu g g^{-1})$ 0.792 0.132	RSD (%) 21.53 13.4	Sensitivity $\frac{(cps/\mu g g^{-1})}{60}$ 70	DL $(\mu g g^{-1})$ 0.018 0.014
Sc V Rb	RV $(\mu g g^{-1})$ 0.74 1.01 0.855	AV (μgg ⁻¹) 2.89 0.95 0.78	DIF (μ g g ⁻¹) 2.15 0.06 0.07	20 μm DIF% (%) 291 5.52 8.5	SD (1σ) $(\mu g g^{-1})$ 0.507 0.116 0.168	RSD (%) 17.52 12.14 21.4	Sensitivity (cps/µgg ⁻¹) 109 130 108	DL (μ gg ⁻¹) 0.004 0.006 0.006	AV $(\mu g g^{-1})$ 3.68 0.99 0.92 1.02	DIF (μ g g ⁻¹) 2.94 0.02 0.06	<u>10 μm</u> DIF% (%) 397 2.35 7.4	SD (1σ) $(\mu g g^{-1})$ 0.792 0.132 0.315	RSD (%) 21.53 13.4 34.3	Sensitivity $\frac{(cps/\mu g g^{-1})}{60}$ 70 58	DL (µgg ⁻¹) 0.018 0.014 0.018
Sc V Rb Sr	RV $(\mu g g^{-1})$ 0.74 1.01 0.855 45.8 0.70	AV $(\mu g g^{-1})$ 2.89 0.95 0.78 44.6 0.00	DIF $(\mu g g^{-1})$ 2.15 0.06 0.07 1.2	20 μm DIF% (%) 291 5.52 8.5 2.5	SD (1σ) $(\mu g g^{-1})$ 0.507 0.116 0.168 1.584	RSD (%) 17.52 12.14 21.4 3.55	Sensitivity (cps/µgg ⁻¹) 109 130 108 137	DL $(\mu g g^{-1})$ 0.004 0.006 0.006 0.002 0.002	AV $(\mu g g^{-1})$ 3.68 0.99 0.92 46.47 0.02	DIF $(\mu g g^{-1})$ 2.94 0.02 0.06 0.67	10 μm DIF% (%) 397 2.35 7.4 1.5	SD (1σ) $(\mu g g^{-1})$ 0.792 0.132 0.315 1.410	RSD (%) 21.53 13.4 34.3 3.03	Sensitivity $\frac{(cps/\mu g g^{-1})}{60}$ $\frac{60}{70}$ $\frac{58}{73}$ $\frac{73}{20}$	DL (µgg ⁻¹) 0.018 0.014 0.018 0.003
Sc V Rb Sr Y	RV $(\mu g g^{-1})$ 0.74 1.01 0.855 45.8 0.79 0.79	AV (μgg ⁻¹) 2.89 0.95 0.78 44.6 0.98	DIF ($\mu g g^{-1}$) 2.15 0.06 0.07 1.2 0.19 0.05	20 μm DIF% (%) 291 5.52 8.5 2.5 2.5 2.3.82	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mugg^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.110 \end{array}$	RSD (%) 17.52 12.14 21.4 3.55 10.9	Sensitivity (cps/μgg ⁻¹) 109 130 108 137 136	$ \begin{array}{c} \text{DL} \\ (\mu g g^{-1}) \\ 0.004 \\ 0.006 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.011 \end{array} $	AV $(\mu g g^{-1})$ 3.68 0.99 0.92 46.47 0.97 0.97	DIF $(\mu g g^{-1})$ 2.94 0.02 0.06 0.67 0.18 2.40	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79	SD (1σ) ($\mu g g^{-1}$) 0.792 0.132 0.315 1.410 0.211	RSD (%) 21.53 13.4 34.3 3.03 21.8	Sensitivity (cps/μgg ⁻¹) 60 70 58 73 73 73	DL (μgg ⁻¹) 0.018 0.014 0.018 0.003 0.014
Sc V Rb Sr Y Zr	RV $(\mu g g^{-1})$ 0.74 1.01 0.855 45.8 0.79 0.848 0.848	AV (μgg ⁻¹) 2.89 0.95 0.78 44.6 0.98 1.06	DIF $(\mu g g^{-1})$ 2.15 0.06 0.07 1.2 0.19 0.21	20 μm DIF% (%) 291 5.52 8.5 2.5 23.82 24.42	SD (1σ) $(\mu g g^{-1})$ 0.507 0.116 0.168 1.584 0.107 0.118	RSD (%) 17.52 12.14 21.4 3.55 10.9 11.2	Sensitivity (cps/μgg ⁻¹) 109 130 108 137 136 73	$\begin{array}{c} \text{DL} \\ (\mu g g^{-1}) \\ 0.004 \\ 0.006 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.014 \\ 0.024 \end{array}$	AV (μgg ⁻¹) 3.68 0.99 0.92 46.47 0.97 0.98	DIF $(\mu g g^{-1})$ 2.94 0.02 0.06 0.67 0.18 0.13 0.13	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51	SD (1σ) $(\mu g g^{-1})$ 0.792 0.132 0.315 1.410 0.211 0.288	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 39	DL $(\mu g g^{-1})$ 0.018 0.014 0.018 0.003 0.014 0.024
Sc V Rb Sr Y Zr Nb	RV $(\mu g g^{-1})$ 0.74 1.01 0.855 45.8 0.79 0.848 0.824		$DIF \\ (\mu g g^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.19 \\ 0.21 \\ 0.07 \\ 0.07 \\ 0.07 \\ 0.07 \\ 0.01 \\ 0.07 \\ 0.01 \\ 0$	20 μm DIF% (%) 291 5.52 8.5 2.5 23.82 24.42 9.0	$\frac{\text{SD} (1 \sigma)}{(\mu g g^{-1})}$ 0.507 0.116 0.168 1.584 0.107 0.118 0.164	RSD (%) 17.52 12.14 21.4 3.55 10.9 11.2 18.3	Sensitivity (cps/ µg g ⁻¹) 109 130 108 137 136 73 150	$\begin{array}{c} \text{DL} \\ (\mu \text{g} \text{g}^{-1}) \\ 0.004 \\ 0.006 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.014 \\ 0.006 \\ 0.006 \\ 0.007 \\ \end{array}$		DIF $(\mu g g^{-1})$ 2.94 0.02 0.06 0.67 0.18 0.13 0.17 0.17	10 μm DIF% (%) 2.35 7.4 1.5 22.79 15.51 20.45	$SD (1 \sigma) (\mu_{g g}^{-1}) 0.792 0.132 0.315 1.410 0.211 0.288 0.173 0.173$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 39 81	DL $(\mu g g^{-1})$ 0.018 0.014 0.018 0.003 0.014 0.024 0.014
Sc V Rb Sr Y Zr Nb Ba	RV (μ_{gg}^{-1}) 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 5.2 5.2 5.2 5.2 5.2 5.2 5.2 5		DIF $(\mu g g^{-1})$ 2.15 0.06 0.07 1.2 0.19 0.21 0.07 0.23	20 μm DIF% (%) 291 5.52 8.5 2.5 23.82 24.42 9.0 7.2 7.2	$\frac{\text{SD} (1 \sigma)}{(\mu_{g g} \text{g}^{-1})} \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 $	RSD (%) 17.52 12.14 21.4 3.55 10.9 11.2 18.3 21.8	Sensitivity (cps/µgg ⁻¹) 109 130 108 137 136 73 150 21 21	DL (µgg ⁻¹) 0.004 0.006 0.006 0.002 0.005 0.014 0.006 0.037	AV (μgg ⁻¹) 3.68 0.99 0.92 46.47 0.97 0.98 0.99 2.79 2.79	$\begin{array}{c} \text{DIF} \\ (\mu \text{g g}^{-1}) \\ 2.94 \\ 0.02 \\ 0.06 \\ 0.67 \\ 0.18 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.41 \\ 0.10 \\ 0$	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8	SD (1σ) $(\mu_{g g}^{-1})$ 0.792 0.132 0.315 1.410 0.211 0.288 0.173 0.764	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 73 39 81 11	$\begin{array}{c} \text{DL} \\ (\mu \text{g g}^{-1}) \\ 0.018 \\ 0.014 \\ 0.018 \\ 0.003 \\ 0.014 \\ 0.024 \\ 0.014 \\ 0.024 \\ 0.014 \\ 0.076 \\ 0.016 \end{array}$
Sc V Rb Sr Y Zr Nb Ba La	RV (<u>µgg⁻¹)</u> 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72	AV (μgg ⁻¹) 2.89 0.95 0.78 44.6 0.98 1.06 0.90 2.97 0.76 0.76	$DIF \\ (\mu g g^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.19 \\ 0.21 \\ 0.07 \\ 0.23 \\ 0.04 \\ 0.04 \\ 0.01 \\ 0$	20 μm DIF% (%) 291 5.52 8.5 2.5 23.82 24.42 9.0 7.2 5.2 5.2	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu \text{g g}^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.044 \end{array}$	RSD (%) 17.52 12.14 21.4 3.55 10.9 11.2 18.3 21.8 5.8	Sensitivity (cps/ µg g ⁻¹) 109 130 130 130 136 73 136 73 150 21 156	DL (µ g g ⁻¹) 0.004 0.006 0.002 0.005 0.014 0.005 0.037 0.005	AV (μgg ⁻¹) 3.68 0.99 0.92 46.47 0.97 0.98 0.99 2.79 0.82	$\begin{array}{c} \text{DIF} \\ (\mu \text{g g}^{-1}) \\ 2.94 \\ 0.02 \\ 0.06 \\ 0.67 \\ 0.18 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.10 \\ 0.01 \\ \end{array}$	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu g g^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.218 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.764 \\ 0.153 \end{array}$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 73 39 81 11 85	$\begin{array}{c} \text{DL} \\ (\mu \text{g g}^{-1}) \\ 0.018 \\ 0.014 \\ 0.018 \\ 0.003 \\ 0.014 \\ 0.024 \\ 0.014 \\ 0.076 \\ 0.010 \\ 0.020 \end{array}$
Sc V Rb Sr Y Zr Ba La Ce	RV (<u>µgg⁻¹)</u> 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813	AV $(\mu g g^{-1})$ 2.89 0.95 0.78 44.6 0.98 1.06 0.90 2.97 0.76 0.73 0.73	$\begin{array}{c} \text{DIF} \\ (\mu g g^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.19 \\ 0.21 \\ 0.21 \\ 0.23 \\ 0.04 \\ 0.09 \\ 0.25 \end{array}$	20 μm DIF% (%) 291 5.52 8.5 2.5 2.5 2.3.82 24.42 9.0 7.2 5.2 10.7	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu \mathrm{g} \mathrm{g}^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.044 \end{array}$	RSD (%) 17.52 12.14 21.4 3.55 10.9 11.2 18.3 21.8 5.8 15.8	Sensitivity (cps/µgg ⁻¹) 109 108 137 136 73 150 21 156 182 182	DL (µgg ⁻¹) 0.004 0.006 0.002 0.005 0.014 0.006 0.037 0.005 0.003	AV (μg g ⁻¹) 3.68 0.99 0.92 46.47 0.97 0.98 0.99 2.79 0.82 0.82 0.82	$\begin{array}{c} \text{DIF} \\ (\mu \text{g g}^{-1}) \\ 2.94 \\ 0.02 \\ 0.06 \\ 0.67 \\ 0.18 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.10 \\ 0.01 \\ 0.01 \\ \end{array}$	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.1	$SD (1 \sigma) (\mu_{\underline{g} \underline{g}}^{-1}) 0.792 0.132 0.315 1.410 0.211 0.288 0.173 0.764 0.153 0.294 0.294$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 39 81 11 85 99	DL (μgg ⁻¹) 0.018 0.014 0.018 0.003 0.014 0.014 0.024 0.014 0.076 0.010 0.006
Sc V Rb Sr Y Zr Ba La Ce Pr	RV (µgg ⁻¹) 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.824 3.2 0.813 0.813 0.768	AV (μgg ⁻¹) 2.89 0.95 0.78 44.6 0.98 1.06 0.90 2.97 0.76 0.73 0.71	$\begin{array}{c} \text{DIF} \\ (\mu \underline{g} \underline{g}^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.19 \\ 0.21 \\ 0.07 \\ 0.23 \\ 0.04 \\ 0.09 \\ 0.06 \\ 0.06 \\ \end{array}$	20 μm DIF% (%) 291 5.52 8.5 2.5 2.85 2.5 2.82 24.42 9.0 7.2 5.2 10.7 7.6	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{g g}^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.11$	RSD (%) 17.52 12.14 21.4 3.55 10.9 11.2 18.3 21.8 5.8 15.8 15.8 16.4	Sensitivity (cps/ µ g g ⁻¹) 109 108 137 136 73 150 21 156 182 202	$\begin{array}{c} DL \\ (\mu_{gg}^{-1}) \\ 0.004 \\ 0.006 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.014 \\ 0.006 \\ 0.037 \\ 0.005 \\ 0.003 \\ 0.$	AV (μgg ⁻¹) 3.68 0.99 0.92 46.47 0.97 0.98 0.99 2.79 0.82 0.82 0.82	$\begin{array}{c} \text{DIF} \\ (\mu g g^{-1}) \\ 2.94 \\ 0.02 \\ 0.06 \\ 0.67 \\ 0.18 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.10 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ \end{array}$	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.8	$\begin{array}{c} \text{SD} (1\sigma) \\ (\mu_{\text{g}\text{g}}^{-1}) \\ 0.792 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \end{array}$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8 12.81	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 39 81 11 85 99 103	$\begin{array}{c} DL \\ (\mu g g^{-1}) \\ 0.018 \\ 0.014 \\ 0.003 \\ 0.014 \\ 0.024 \\ 0.076 \\ 0.010 \\ 0.006 \\ 0.009 \end{array}$
Sc V Rb Sr Y Zr Nb Ba La Ce Pr Nd	RV (<u>µ g g⁻¹)</u> 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752	AV (μgg ⁻¹) 2.89 0.95 0.78 44.6 0.98 1.06 0.90 2.97 0.76 0.73 0.71 0.67	DIF $(\mu_{g}g^{-1})$ 2.15 0.06 0.07 1.2 0.19 0.21 0.07 0.23 0.04 0.09 0.06 0.08	20 μm DIF% (%) 291 5.52 8.5 23.82 24.42 9.0 7.2 24.42 9.0 7.2 10.7 7.6 10.47	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{g g}^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \end{array}$	RSD (%) 17.52 12.14 3.55 10.9 11.2 18.3 21.8 5.8 15.8 16.4 51.7	Sensitivity (cps/ µ g g ⁻¹) 109 130 137 136 73 150 21 156 182 202 34	$\begin{array}{c} DL \\ (\mu_{\mathcal{B} \mathcal{B}}^{-1}) \\ 0.004 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.014 \\ 0.006 \\ 0.037 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.054 \end{array}$	AV (<u>µ g g⁻¹</u>) 3.68 0.99 0.92 46.47 0.97 0.98 0.99 2.79 0.82 0.78 0.82 0.78	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.94 \\ 0.02 \\ 0.06 \\ 0.67 \\ 0.18 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.10 \\ 0.01 \\ 0.01 \\ 0.20 \\ \end{array}$	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.1 1.8 27.2	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu_{g \ g}^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \\ 0.169 \end{array}$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8 12.81 17.7	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 73 39 81 11 85 99 103 16	DL (μgg ⁻¹) 0.018 0.014 0.014 0.014 0.014 0.024 0.014 0.076 0.000 0.009 0.146
Sc V Rb Sr Y Zr Ba La Ce Pr Nd Sm	RV (<u>µ g g⁻¹)</u> 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752 0.754	AV (<u>µ g g ⁻¹)</u> 2.89 0.95 0.78 44.6 0.98 1.06 0.90 2.97 0.76 0.73 0.71 0.67 0.79	DIF (<u>µg g⁻¹)</u> 2.15 0.06 0.07 1.2 0.19 0.21 0.21 0.23 0.04 0.09 0.06 0.08 0.08 0.04	20 μm DIF% (%) 291 5.52 8.5 23.82 24.42 9.0 7.2 5.2 10.7 7.6 10.47 5.0	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu_{g \ g}^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \\ 0.226 \end{array}$	RSD (%) 17.52 12.14 3.55 10.9 11.2 18.3 21.8 5.8 15.8 16.4 51.7 28.5	Sensitivity (cps/µgg ⁻¹) 109 108 137 136 73 150 21 156 182 202 34 26	DL (µgg ⁻¹) 0.004 0.006 0.002 0.005 0.005 0.014 0.006 0.037 0.005 0.003 0.003 0.003 0.003 0.003	AV (μgg ⁻¹) 3.68 0.99 0.92 46.47 0.97 0.98 0.99 2.79 0.82 0.78 0.96 0.82	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.94 \\ 0.02 \\ 0.66 \\ 0.67 \\ 0.18 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.10 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.00 \\ 0.07 \\ \end{array}$	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.1 1.8 27.2 8.94	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu g \ g^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \\ 0.169 \\ 0.386 \end{array}$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8 12.81 17.7 47.0	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 39 81 11 85 99 103 16 14	DL (µgg ⁻¹) 0.018 0.014 0.018 0.003 0.014 0.024 0.014 0.076 0.010 0.006 0.009 0.146 0.140
Sc V Rb Sr Y Zr b B a C e r Nd Sm Eu	RV (<u>µ g g⁻¹)</u> 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752 0.752 0.752 0.77	AV (µgg ⁻¹) 2.89 0.95 0.78 44.6 0.98 1.06 0.90 2.97 0.76 0.73 0.71 0.73 0.71 0.79 0.69	$\begin{array}{c} \text{DJF} \\ (\mu_{\text{gg}}^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.12 \\ 0.07 \\ 0.21 \\ 0.07 \\ 0.23 \\ 0.04 \\ 0.09 \\ 0.06 \\ 0.08 \\ 0.04 \\ 0.08 \\ \end{array}$	20 μm DIF% (%) 291 5.52 8.5 2.5 23.82 24.42 9.0 7.2 5.2 10.7 7.6 10.47 5.0 10.8	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu \ g \ g^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \\ 0.226 \\ 0.093 \end{array}$	RSD (%) 17.52 12.14 21.4 3.55 10.9 11.2 18.3 21.8 5.8 15.8 15.8 15.8 15.8 15.8 15.8 15	Sensitivity (cps/ µ g g ⁻¹) 109 108 137 136 137 136 73 150 21 156 182 202 34 26 106	$\begin{array}{c} \\ DL \\ (\mu_{gg}^{-1}) \\ 0.004 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.014 \\ 0.006 \\ 0.037 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.004 \\ 0.083 \\ 0.008 \end{array}$	AV (μg g ⁻¹) 3.68 0.99 46.47 0.97 0.98 0.99 2.79 0.82 0.78 0.96 0.82 0.66	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.94 \\ 0.02 \\ 0.06 \\ 0.67 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.10 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.07 \\ 0.11 \\ \end{array}$	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.1 1.8 27.2 8.94 13.8	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu_{g \ g}^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \\ 0.169 \\ 0.386 \\ 0.234 \end{array}$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8 12.81 17.7 47.0 35.3	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 39 81 11 85 99 103 16 14 54	DL (<u>µ g g⁻¹)</u> 0.018 0.014 0.003 0.014 0.024 0.014 0.076 0.010 0.006 0.009 0.146 0.140 0.020
Sc ∨ Rb Sr Y Zr b B a C Pr Nd Sm Gd	RV (µ g g ⁻¹) 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.763	$\begin{tabular}{ c c c c c } \hline AV & \hline (\mu g g^{-1}) \\ \hline 2.89 & 0.95 \\ 0.78 & 0.78 \\ 0.98 & 1.06 \\ 0.90 & 2.97 \\ 0.76 & 0.73 \\ 0.71 & 0.67 \\ 0.73 & 0.71 \\ 0.67 & 0.69 \\ 0.88 \end{tabular}$	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.19 \\ 0.21 \\ 0.07 \\ 0.23 \\ 0.04 \\ 0.09 \\ 0.06 \\ 0.08 \\ 0.08 \\ 0.08 \\ 0.12 \end{array}$	20 μm DIF% (%) 291 5.52 8.5 2.5 23.82 24.42 9.0 7.2 5.2 10.7 7.6 10.47 5.0 10.8 15.1	$ \begin{array}{c} \text{SD} (1 \sigma) \\ (\mu \mathrm{g} \mathrm{g}^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \\ 0.226 \\ 0.093 \\ 0.304 \end{array} $	RSD (%) 17.52 12.14 21.4 3.55 10.9 11.2 18.3 21.8 5.8 15.8 15.8 15.8 15.8 15.8 15.8 15	Sensitivity (cps/µgg ⁻¹) 109 109 130 137 136 73 150 21 156 182 202 34 26 106 29	$\begin{array}{c} \\ DL \\ (\mu g g^{-1}) \\ 0.004 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.014 \\ 0.006 \\ 0.037 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.008 \\ 0.008 \\ 0.062 \end{array}$	AV (μg g ⁻¹) 3.68 0.99 46.47 0.97 0.98 0.99 2.79 0.82 0.78 0.96 0.82 0.66 0.92	DIF (µgg ⁻¹) 2.94 0.02 0.67 0.18 0.13 0.17 0.41 0.10 0.01 0.01 0.01 0.01 0.20 0.07 0.11 0.16	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.1 1.8 27.2 8.94 1.3.8 20.79	$\begin{array}{c} \text{SD} \ (1\ \sigma) \\ (\mu_{g\ g}\ ^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \\ 0.169 \\ 0.386 \\ 0.234 \\ 0.452 \end{array}$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8 12.81 17.7 47.0 35.3 49.0	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 39 81 11 85 99 103 16 14 54 14	$\begin{array}{c} DL \\ (\mu_{\mathcal{B}\mathcal{R}}^{-1}) \\ 0.018 \\ 0.014 \\ 0.003 \\ 0.014 \\ 0.024 \\ 0.014 \\ 0.076 \\ 0.010 \\ 0.006 \\ 0.009 \\ 0.146 \\ 0.140 \\ 0.020 \\ 0.020 \\ 0.105 \end{array}$
Sc V B Sr Y Zr B a a e r d m u d b	RV (<u>µgg⁻¹)</u> 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752 0.752 0.754 0.763 0.763 0.739	AV (μ g g ⁻¹) 2.89 0.95 0.78 44.6 0.90 2.97 0.76 0.73 0.76 0.73 0.76 0.79 0.67 0.79 0.88 0.93	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.19 \\ 0.23 \\ 0.04 \\ 0.09 \\ 0.06 \\ 0.08 \\ 0.04 \\ 0.08 \\ 0.04 \\ 0.08 \\ 0.012 \\ 0.12 \\ 0.19 \\ 0.12$	20 µm DIF% (%) 291 5.52 8.5 2.5 23.82 24.42 9.0 7.2 5.2 10.7 7.6 10.47 5.0 10.47 5.0 10.47 5.0 15.1 25.54	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{g g}^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \\ 0.226 \\ 0.093 \\ 0.304 \\ 0.162 \end{array}$	RSD (%) 17.52 12.14 21.4 3.55 10.9 11.2 18.3 21.8 5.8 15.8 16.4 51.7 28.5 13.5 34.6 17.4	Sensitivity (cps/ µg g ⁻¹) 109 130 130 137 136 73 150 21 156 182 202 34 26 106 29 180	$\begin{array}{c} DL \\ (\mu g g^{-1}) \\ 0.004 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.014 \\ 0.006 \\ 0.037 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.054 \\ 0.083 \\ 0.008 \\ 0.008 \\ 0.062 \\ 0.003 \\ 0.054 \\ 0.062 \\ 0.003 \\ 0.055 \\ 0.003 \\ 0.054 \\ 0.008 \\ 0.008 \\ 0.003 \\ 0.0$	AV (με g ⁻¹) 3.68 0.99 0.92 46.47 0.97 0.98 0.99 2.79 0.82 0.78 0.96 0.82 0.78 0.96 0.82 0.66 0.92 0.89 0.89	DIF (µgg ⁻¹) 2.94 0.02 0.66 0.18 0.13 0.17 0.41 0.10 0.01 0.01 0.20 0.07 0.11 0.16 0.15	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.8 27.2 8.94 3.8 20.79 19.76	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu_{g \ g}^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \\ 0.169 \\ 0.386 \\ 0.234 \\ 0.452 \\ 0.17$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8 12.81 17.7 47.0 35.3 49.0 19.47	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 39 81 11 85 99 103 16 14 54 14 92 2	DL (µgg ⁻¹) 0.018 0.014 0.018 0.003 0.014 0.014 0.014 0.014 0.076 0.010 0.009 0.146 0.109 0.009 0.146 0.105 0.0105 0.0105
Sc V Rb Sr Y Zr Nb Ba La Ce Pr d Sm E Gd Tb Dy	RV (µgg ⁻¹) 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.763 0.7739 0.746	AV (µgg ⁻¹) 2.89 0.95 0.78 44.6 0.90 2.97 0.76 0.73 0.71 0.67 0.79 0.69 0.88 0.93 0.79	$\begin{array}{c} \text{DJF} \\ (\mu_{B}g^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.21 \\ 0.07 \\ 0.21 \\ 0.07 \\ 0.23 \\ 0.04 \\ 0.09 \\ 0.06 \\ 0.08 \\ 0.04 \\ 0.08 \\ 0.12 \\ 0.04 \\ 0.04 \\ 0.04 \\ \end{array}$	20 µm DIF% (%) 291 5.52 8.5 2.5 23.82 24.42 9.0 7.2 5.2 10.7 7.6 10.47 5.0 10.8 15.1 25.54 5.76	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu \ g \ g^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \\ 0.226 \\ 0.093 \\ 0.304 \\ 0.162 \\ 0.234 \end{array}$	RSD (%) 17.52 12.14 21.4 3.55 10.9 11.2 18.3 21.8 5.8 15.8 15.8 15.8 15.8 15.8 15.8 15	Sensitivity (cps/µgg ⁻¹) 109 108 137 136 73 150 21 156 182 202 34 26 106 29 180 43	$\begin{array}{c} \\ DL \\ (\mu g g^{-1}) \\ 0.004 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.0014 \\ 0.006 \\ 0.037 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.008 \\ 0.062 \\ 0.003 \\ 0.016 \end{array}$	AV (μg g ⁻¹) 3.68 0.99 46.47 0.97 0.98 0.99 2.79 0.82 0.78 0.96 0.82 0.66 0.92 0.82 0.82 0.82 0.82 0.82 0.82 0.82 0.82	$\begin{array}{c} \text{DIF} \\ (\mu_{BB}^{-1}) \\ 2.94 \\ 0.02 \\ 0.06 \\ 0.67 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.10 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.07 \\ 0.11 \\ 0.15 \\ 0.20 \\ \end{array}$	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.1 1.8 27.2 8.94 13.8 20.79 19.76 27.06	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu_{g \ g}^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.221 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \\ 0.169 \\ 0.386 \\ 0.234 \\ 0.452 \\ 0.172 \\ 0.128 \end{array}$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8 12.81 17.7 47.0 35.3 49.0 19.47 13.5	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 39 81 11 85 99 103 16 14 54 14 54 14 92 22	$\begin{array}{c} DL \\ (\mugg^{-1}) \\ 0.018 \\ 0.018 \\ 0.018 \\ 0.003 \\ 0.014 \\ 0.024 \\ 0.014 \\ 0.024 \\ 0.016 \\ 0.006 \\ 0.009 \\ 0.146 \\ 0.020 \\ 0.140 \\ 0.020 \\ 0.105 \\ 0.010 \\ 0.067 \end{array}$
Sc V Rb Sr Y Zr Nb a La Ce Pr d Sm U G Dy Ho	RV (µgg ⁻¹) 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.763 0.779 0.746 0.749	$\begin{tabular}{ c c c c c } \hline AV & $(\mu \ge g^{-1})$ \\ \hline 2.89 & 0.95 \\ \hline 2.89 & 0.78 \\ \hline 44.6 & 0.98 \\ \hline 1.06 & 0.90 \\ \hline 0.90 & 2.97 \\ \hline 0.78 & 0.90 \\ \hline 0.90 & 2.97 \\ \hline 0.73 & 0.71 \\ \hline 0.69 & 0.88 \\ \hline 0.93 & 0.79 \\ \hline 0.92 & 0.92 \\ \hline \end{tabular}$	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.19 \\ 0.21 \\ 0.07 \\ 0.23 \\ 0.04 \\ 0.09 \\ 0.06 \\ 0.08 \\ 0.04 \\ 0.08 \\ 0.12 \\ 0.04 \\ 0.017 \\ \end{array}$	20 µm DIF% (%) 291 5.52 8.5 2.5 23.82 9.0 7.2 5.2 10.7 7.6 10.47 5.0 10.8 15.1 25.5 10.8 15.1 25.76 22.71	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{g g} g^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \\ 0.226 \\ 0.093 \\ 0.304 \\ 0.162 \\ 0.234 \\ 0.127 \end{array}$	RSD (%) 17.52 12.14 21.4 3.55 10.9 11.2 18.3 21.8 5.8 15.8 15.8 15.8 15.8 15.8 15.8 15	Sensitivity (cps/ µ g g ⁻¹) 109 108 137 136 73 150 21 156 182 202 34 26 106 29 180 43 167	$\begin{array}{c} DL \\ (\mu_{\mathcal{B}\mathcal{R}}^{-1}) \\ 0.004 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.014 \\ 0.006 \\ 0.037 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.003 \\ 0.016 \\ 0.004 \end{array}$	AV (μg g ⁻¹) 3.68 0.99 46.47 0.97 0.98 0.99 2.79 0.82 0.82 0.78 0.96 0.92 0.82 0.82 0.66 0.92 0.89 0.95 0.88	$\begin{array}{c} \text{DJF} \\ (\mu_{gg}^{-1}) \\ 2.94 \\ 0.02 \\ 0.06 \\ 0.67 \\ 0.18 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.13$	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.1 1.8 27.2 8.94 13.8 20.79 19.76 27.06	$\begin{array}{c} \text{SD} \ (1\ \sigma) \\ (\mu_{g\ g}\ ^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \\ 0.169 \\ 0.386 \\ 0.234 \\ 0.452 \\ 0.172 \\ 0.128 \\ 0.156 \end{array}$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8 12.81 17.7 47.0 35.3 49.0 19.47 13.5 17.7	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 39 81 11 85 99 103 16 14 54 14 92 22 85	$\begin{array}{c} DL \\ (\mu_{BB}^{-1}) \\ 0.018 \\ 0.014 \\ 0.003 \\ 0.014 \\ 0.024 \\ 0.014 \\ 0.076 \\ 0.010 \\ 0.006 \\ 0.009 \\ 0.146 \\ 0.140 \\ 0.020 \\ 0.105 \\ 0.010 \\ 0.067 \\ 0.010 \end{array}$
S ∨ Rb Sr Y Zrb Ba La Cerrd Mm Lu Gd b Dror Frd Dror Frd SEU Gd b Dror Fr	RV (µ g g ⁻¹) 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.763 0.779 0.746 0.749 0.74	$\begin{tabular}{ c c c c } \hline AV & (\mu \ g \ g^{-1}) \\ \hline 2.89 & 0.95 \\ 0.78 & 0.78 \\ 0.98 & 1.06 \\ 0.90 & 2.97 \\ 0.76 & 0.73 \\ 0.71 & 0.67 \\ 0.73 & 0.71 \\ 0.67 & 0.73 \\ 0.69 & 0.88 \\ 0.93 & 0.79 \\ 0.88 & 0.92 \\ 0.88 \\ \hline \end{tabular}$	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.19 \\ 0.23 \\ 0.04 \\ 0.09 \\ 0.06 \\ 0.08 \\ 0.04 \\ 0.08 \\ 0.04 \\ 0.08 \\ 0.04 \\ 0.08 \\ 0.012 \\ 0.19 \\ 0.01 \\ 0.17 \\ 0.14 \\ \end{array}$	20 µm DIF% (%) 291 5.52 8.5 2.5 23.82 24.42 9.0 7.2 5.2 10.47 5.0 10.47 5.0 10.47 5.1 25.54 5.51 25.54 5.51 19.15	$ \begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{g g}^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \\ 0.226 \\ 0.093 \\ 0.304 \\ 0.162 \\ 0.234 \\ 0.127 \\ 0.195 \end{array} $	RSD (%) 17.52 12.14 3.55 10.9 11.2 18.3 21.8 5.8 15.8 16.4 51.7 28.5 13.5 13.5 13.5 13.5 13.5 13.4 6 17.4 29.6 13.8 22.1	$\begin{array}{c} \text{Sensitivity} \\ (cps / \mu g g^{-1}) \\ 109 \\ 130 \\ 130 \\ 137 \\ 136 \\ 137 \\ 136 \\ 21 \\ 156 \\ 21 \\ 156 \\ 182 \\ 202 \\ 34 \\ 26 \\ 106 \\ 29 \\ 180 \\ 43 \\ 167 \\ 55 \end{array}$	$\begin{array}{c} DL \\ (\mu g g^{-1}) \\ 0.004 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.014 \\ 0.006 \\ 0.037 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.008 \\ 0.002 \\ 0.003 \\ 0.016 \\ 0.004 \\ 0.016 \end{array}$	AV (µgg ⁻¹) 3.68 0.99 0.92 46.47 0.97 0.98 0.99 2.79 0.82 0.78 0.99 0.82 0.78 0.96 0.82 0.66 0.92 0.89 0.95 0.88 0.94	$\begin{array}{c} \text{DJF} \\ (\mu_{gg}^{-1}) \\ 2.94 \\ 0.06 \\ 0.67 \\ 0.18 \\ 0.17 \\ 0.41 \\ 0.10 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.20 \\ 0.07 \\ 0.11 \\ 0.16 \\ 0.15 \\ 0.20 \\ 0.13 \\ 0.20 \\ \end{array}$	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.8 27.2 8.94 3.8 20.79 19.76 27.06 17.60 27.24	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu_{g \ g}^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \\ 0.169 \\ 0.386 \\ 0.234 \\ 0.452 \\ 0.172 \\ 0.128 \\ 0.156 \\ 0.194 \end{array}$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8 12.81 17.7 47.0 35.3 49.0 19.47 13.5 17.7 20.6	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 39 81 11 85 99 103 16 14 54 14 92 22 85 29	$\begin{array}{c} \\ \textbf{DL} \\ (\mu_{BB}^{-1}) \\ 0.018 \\ 0.014 \\ 0.003 \\ 0.014 \\ 0.024 \\ 0.014 \\ 0.076 \\ 0.010 \\ 0.006 \\ 0.009 \\ 0.146 \\ 0.140 \\ 0.020 \\ 0.105 \\ 0.010 \\ 0.067 \\ 0.010 \\ 0.050 \\ \end{array}$
S ∨ Rb Sr Y Zr b Ba La Ce Pr dd m B U dd Fb Dy o Le Tm	RV (<u>µ g g⁻¹)</u> 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.763 0.754 0.77 0.763 0.739 0.746 0.749 0.74 0.732	AV (µgg ⁻¹) 2.89 0.95 0.78 44.6 0.90 1.06 0.90 2.97 0.76 0.73 0.71 0.67 0.79 0.69 0.88 0.93 0.79 0.92 0.88 0.93	$\begin{array}{c} \text{DJF} \\ (\mu_{B}g^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.07 \\ 0.21 \\ 0.07 \\ 0.21 \\ 0.07 \\ 0.23 \\ 0.04 \\ 0.09 \\ 0.06 \\ 0.08 \\ 0.04 \\ 0.08 \\ 0.04 \\ 0.08 \\ 0.04 \\ 0.08 \\ 0.04 \\ 0.19 \\ 0.04 \\ 0.17 \\ 0.14 \\ 0.15 \\ \end{array}$	20 µm DIF% (%) 291 5.52 8.5 2.5 2.82 24.42 9.0 7.2 5.2 10.7 7.6 10.7 7.6 10.7 7.6 10.8 15.1 25.54 5.76 22.71 19.15 19.90	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu \ g \ g^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \\ 0.226 \\ 0.093 \\ 0.304 \\ 0.162 \\ 0.234 \\ 0.127 \\ 0.195 \\ 0.061 \end{array}$	RSD (%) 17.52 12.14 3.55 10.9 11.2 18.3 21.8 5.8 15.8 15.8 15.8 15.8 15.8 15.8 15	Sensitivity (cps/µgg ⁻¹) 109 108 137 136 73 150 21 156 182 202 34 26 106 29 180 43 167 55 55 171	DL (µgg ⁻¹) 0.004 0.006 0.002 0.005 0.014 0.006 0.037 0.005 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.008 0.008 0.002 0.003 0.004 0.004 0.004 0.004 0.006	AV (μg g ⁻¹) 3.68 0.99 46.47 0.97 0.98 0.99 2.79 0.82 0.78 0.96 0.82 0.66 0.92 0.88 0.95 0.88 0.94 0.89	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.94 \\ 0.06 \\ 0.67 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.10 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.15 \\ 0.20 \\ 0.16 \\ \end{array}$	10 µm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.1 1.8 27.2 8.94 13.8 20.79 19.76 27.06 17.60 27.24 22.03	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu_{g \ g}^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \\ 0.169 \\ 0.386 \\ 0.234 \\ 0.452 \\ 0.172 \\ 0.128 \\ 0.156 \\ 0.194 \\ 0.129 \end{array}$	RSD (%) 21.53 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8 12.81 17.7 47.0 35.3 49.0 19.47 13.5 17.7 20.6 14.47	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 39 81 11 11 85 99 103 16 14 54 14 54 14 92 22 85 29 90	$\begin{array}{c} DL \\ (\mugg^{-1}) \\ 0.018 \\ 0.018 \\ 0.018 \\ 0.003 \\ 0.014 \\ 0.024 \\ 0.014 \\ 0.024 \\ 0.010 \\ 0.006 \\ 0.009 \\ 0.146 \\ 0.000 \\ 0.140 \\ 0.020 \\ 0.140 \\ 0.020 \\ 0.105 \\ 0.010 \\ 0.067 \\ 0.010 \\ 0.050 \end{array}$
Sc V Rb Sr Y Zr Nb Ba La Ce Pr Nd M Eu dd Tb U Ho Er M Yb	RV (<u>µ g g ⁻¹)</u> 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752 0.752 0.752 0.754 0.77 0.763 0.746 0.749 0.749 0.742 0.732 0.777	$\begin{tabular}{ c c c c c } \hline AV \\ \hline (\mu {\rm g} {\rm g}^{-1}) \\ \hline 2.89 \\ 0.95 \\ 0.78 \\ 44.6 \\ 0.98 \\ 1.06 \\ 0.90 \\ 2.97 \\ 0.76 \\ 0.73 \\ 0.71 \\ 0.67 \\ 0.73 \\ 0.71 \\ 0.69 \\ 0.88 \\ 0.93 \\ 0.79 \\ 0.92 \\ 0.88 \\ 0.88 \\ 0.96 \\ \hline \end{tabular}$	$\begin{array}{c} \text{DJF} \\ (\mu_{gg}^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.12 \\ 0.07 \\ 0.21 \\ 0.07 \\ 0.23 \\ 0.04 \\ 0.09 \\ 0.06 \\ 0.08 \\ 0.04 \\ 0.09 \\ 0.04 \\ 0.12 \\ 0.19 \\ 0.04 \\ 0.17 \\ 0.14 \\ 0.15 \\ 0.19 \\ \end{array}$	20 µm DIF% (%) 291 5.52 8.5 2.8 2.5 23.82 9.0 7.2 5.2 10.7 7.6 10.47 7.6 10.47 5.0 10.8 15.1 25.54 5.76 22.71 19.15 19.90 23.85	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu \ g \ g^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \\ 0.226 \\ 0.093 \\ 0.304 \\ 0.162 \\ 0.234 \\ 0.127 \\ 0.195 \\ 0.061 \\ 0.145 \end{array}$	RSD (%) 17.52 12.14 3.55 10.9 11.2 18.3 21.8 5.8 15.8 16.4 51.7 28.5 34.6 13.5 34.6 13.5 34.6 13.8 22.1 6.90 15.1	Sensitivity (cps/ µ g g ⁻¹) 109 108 137 136 137 136 21 150 21 156 182 202 34 26 106 29 180 43 167 55 171 38	$\begin{array}{c} \\ DL \\ (\mu_{BB}^{-1}) \\ 0.004 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.014 \\ 0.006 \\ 0.037 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.0016 \\ 0.003 \\ 0.016 \\ 0.003 \\ 0.029 \\ \end{array}$	AV (μg g ⁻¹) 3.68 0.99 46.47 0.97 0.98 0.99 2.79 0.82 0.82 0.82 0.66 0.92 0.83 0.94 0.89 0.95	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.94 \\ 0.02 \\ 0.06 \\ 0.67 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.10 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.16 \\ 0.13 \\ 0.20 \\ 0.13 \\ 0.20 \\ 0.16 \\ 0.17 \end{array}$	10 µm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.1 1.8 27.2 8.94 13.8 20.79 19.76 17.60 27.06 17.60 27.04 22.03 22.00	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu_{\text{g g}}^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \\ 0.169 \\ 0.386 \\ 0.234 \\ 0.452 \\ 0.172 \\ 0.128 \\ 0.156 \\ 0.194 \\ 0.129 \\ 0.220 \end{array}$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8 12.81 17.7 47.0 35.3 49.0 19.47 13.5 17.7 20.6 14.47 23.2	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 39 81 11 85 99 103 16 14 54 14 54 14 92 22 85 29 90 19	$\begin{array}{c} \\ \textbf{DL} \\ (\mu g g^{-1}) \\ 0.018 \\ 0.014 \\ 0.003 \\ 0.014 \\ 0.024 \\ 0.014 \\ 0.076 \\ 0.010 \\ 0.006 \\ 0.009 \\ 0.140 \\ 0.000 \\ 0.100 \\ 0.000 \\ 0.105 \\ 0.010 \\ 0.067 \\ 0.010 \\ 0.050 \\ 0.006 \\ 0.094 \\ \end{array}$
Sc V B Sr Y Zr b a La ce Pr d Sm U d b V fb Sr Y Lu	RV (µ g g ⁻¹) 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.763 0.779 0.746 0.749 0.74 0.749 0.742 0.777 0.732	$\begin{tabular}{ c c c c c } \hline AV & (\mu \ g \ g^{-1}) \\ \hline 2.89 & 0.95 \\ 0.78 & 44.6 \\ 0.98 & 1.06 \\ 0.90 & 2.97 \\ 0.76 & 0.73 \\ 0.71 & 0.67 \\ 0.73 & 0.71 \\ 0.67 & 0.73 \\ 0.71 & 0.67 \\ 0.73 & 0.71 \\ 0.68 & 0.90 \\ 0.88 & 0.93 \\ 0.92 & 0.88 \\ 0.88 & 0.96 \\ 0.85 & 0.85 \\ \hline \end{tabular}$	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.19 \\ 0.23 \\ 0.04 \\ 0.09 \\ 0.06 \\ 0.08 \\ 0.04 \\ 0.08 \\ 0.12 \\ 0.19 \\ 0.04 \\ 0.17 \\ 0.14 \\ 0.15 \\ 0.19 \\ 0.11 \end{array}$	20 µm DIF% (%) 291 5.52 8.5 2.5 23.82 24.42 9.0 7.2 5.2 10.7 7.6 10.47 5.0 10.8 15.1 25.54 5.76 22.71 19.15 19.90 23.85 15.67	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu \mathrm{g} \mathrm{g}^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \\ 0.226 \\ 0.093 \\ 0.304 \\ 0.162 \\ 0.234 \\ 0.127 \\ 0.195 \\ 0.061 \\ 0.145 \\ 0.035 \end{array}$	RSD (%) 17.52 12.14 3.55 10.9 11.2 18.3 21.8 5.8 15.8 16.4 51.7 28.5 34.6 17.4 29.6 13.8 22.1 6.90 15.1 4.1	$\begin{array}{c} \text{Sensitivity} \\ (cps / \mu g g^{-1}) \\ 109 \\ 109 \\ 130 \\ 108 \\ 137 \\ 136 \\ 73 \\ 150 \\ 21 \\ 156 \\ 162 \\ 202 \\ 34 \\ 26 \\ 106 \\ 29 \\ 180 \\ 43 \\ 167 \\ 55 \\ 171 \\ 38 \\ 169 \end{array}$	$\begin{array}{c} \\ DL \\ (\mu g g^{-1}) \\ 0.004 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.014 \\ 0.006 \\ 0.037 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.004 \\ 0.016 \\ 0.003 \\ 0.029 \\ 0.004 \\ 0$	AV (μg g ⁻¹) 3.68 0.99 46.47 0.97 0.98 0.99 2.79 0.82 0.78 0.96 0.82 0.78 0.96 0.92 0.82 0.78 0.96 0.92 0.82 0.66 0.92 0.88 0.95 0.73	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.94 \\ 0.02 \\ 0.06 \\ 0.67 \\ 0.18 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.10 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.20 \\ 0.01 \\ 0.11 \\ 0.16 \\ 0.15 \\ 0.20 \\ 0.13 \\ 0.20 \\ 0.17 \\ 0.00 \\ \end{array}$	10 μm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.8 27.2 8.94 1.1 1.8 27.2 8.94 13.8 20.79 19.76 27.06 27.24 22.00 0.07	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu_{g \ g}^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \\ 0.169 \\ 0.386 \\ 0.234 \\ 0.452 \\ 0.172 \\ 0.128 \\ 0.156 \\ 0.194 \\ 0.129 \\ 0.220 \\ 0.117 \end{array}$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8 12.81 17.7 47.0 35.3 49.0 19.47 13.5 17.7 20.6 14.47 23.2 16.03	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 39 81 11 85 99 103 16 14 54 14 99 103 16 14 54 14 99 22 85 29 90 19 84	$\begin{array}{c} \\ \textbf{DL} \\ (\mu_{BB}^{-1}) \\ 0.018 \\ 0.014 \\ 0.003 \\ 0.014 \\ 0.024 \\ 0.014 \\ 0.076 \\ 0.010 \\ 0.009 \\ 0.146 \\ 0.140 \\ 0.009 \\ 0.146 \\ 0.140 \\ 0.009 \\ 0.105 \\ 0.010 \\ 0.050 \\ 0.010 \\ 0.050 \\ 0.094 \\ 0.008 \end{array}$
Sc V Rb Sr Y Zr Nb Ba La Ce Pr Nb Br La Ch Dr Nb La Ch Pr La Ch	RV (<u>µ g g⁻¹)</u> 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.763 0.754 0.77 0.739 0.746 0.739 0.749 0.74 0.732 0.777 0.732 0.711	AV (μ g g ⁻¹) 2.89 0.95 0.78 44.6 0.98 1.06 0.90 2.97 0.76 0.73 0.71 0.67 0.79 0.69 0.88 0.88 0.88 0.85 0.84	$\begin{array}{c} \text{DJF} \\ (\mu_{B}g^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.07 \\ 0.21 \\ 0.07 \\ 0.21 \\ 0.07 \\ 0.04 \\ 0.09 \\ 0.06 \\ 0.08 \\ 0.04 \\ 0.09 \\ 0.04 \\ 0.08 \\ 0.12 \\ 0.11 \\ 0.14 \\ 0.15 \\ 0.11 \\ 0.12 \\ \end{array}$	20 µm DIF% (%) 291 5.52 8.5 2.5 23.82 24.42 9.0 7.2 10.7 7.6 10.47 5.0 10.8 15.1 25.54 5.76 22.51 19.90 23.85 15.67 17.45	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu \ g \ g^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \\ 0.226 \\ 0.093 \\ 0.304 \\ 0.162 \\ 0.234 \\ 0.127 \\ 0.195 \\ 0.061 \\ 0.145 \\ 0.035 \\ 0.133 \end{array}$	RSD (%) 17.52 12.14 3.55 10.9 11.2 18.3 21.8 5.8 15.8 15.8 15.8 15.8 15.8 15.8 15	Sensitivity (cps/µgg ⁻¹) 109 108 137 136 73 150 21 156 182 202 34 26 106 29 180 43 167 55 171 38 169 50	DL (µgg ⁻¹) 0.004 0.006 0.002 0.005 0.014 0.006 0.037 0.005 0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.008 0.008 0.008 0.008 0.008 0.003 0.004 0.001 0.004 0.001 0.004 0.003 0.004	AV (μgg ⁻¹) 3.68 0.99 46.47 0.92 46.47 0.99 2.79 0.82 0.78 0.96 0.82 0.66 0.92 0.88 0.96 0.89 0.95 0.88 0.94 0.89 0.95 0.73 0.79	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.94 \\ 0.06 \\ 0.67 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.10 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.20 \\ 0.07 \\ 0.11 \\ 0.16 \\ 0.15 \\ 0.20 \\ 0.16 \\ 0.17 \\ 0.00 \\ 0.08 \\ \end{array}$	10 µm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.1 1.8 27.2 8.94 13.8 20.79 19.76 27.06 17.60 27.24 22.03 22.00 0.07 10.92	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu g \ g^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.169 \\ 0.386 \\ 0.234 \\ 0.452 \\ 0.172 \\ 0.128 \\ 0.156 \\ 0.194 \\ 0.129 \\ 0.220 \\ 0.117 \\ 0.261 \end{array}$	RSD (%) 21.53 34.3 3.03 21.8 29.4 17.5 27.4 17.5 27.4 18.6 35.8 12.81 17.7 47.0 35.3 49.0 19.47 13.5 17.7 20.6 14.47 23.6 33.1	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 39 81 11 85 99 103 16 14 54 14 92 22 85 29 90 19 84 24	DL (µgg ⁻¹) 0.018 0.018 0.018 0.014 0.024 0.014 0.024 0.010 0.006 0.009 0.146 0.140 0.009 0.140 0.020 0.140 0.020 0.010 0.010 0.010 0.010 0.010 0.006 0.006 0.006 0.006 0.008
Sc V B Sr Y Zr bb Ba Ba Ce Pr bd Sm Lu dd bb y be Fr m bb Lu ff Ta	RV (µ g g ⁻¹) 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.763 0.754 0.77 0.763 0.746 0.749 0.746 0.749 0.746 0.732 0.777 0.732 0.771 0.732 0.711 0.808	$\begin{tabular}{ c c c c c } \hline AV \\ \hline (\mu {}_{B} {}_{B}^{-1}) \\ \hline 2.89 \\ 0.95 \\ 0.78 \\ 44.6 \\ 0.90 \\ 2.97 \\ 0.78 \\ 1.06 \\ 0.90 \\ 2.97 \\ 0.73 \\ 0.71 \\ 0.73 \\ 0.71 \\ 0.73 \\ 0.71 \\ 0.69 \\ 0.88 \\ 0.93 \\ 0.79 \\ 0.92 \\ 0.88 \\ 0.96 \\ 0.85 \\ 0.84 \\ 0.96 \end{tabular}$	$\begin{array}{c} \text{DJF} \\ (\mu_{\text{E}\text{g}}^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.07 \\ 0.21 \\ 0.07 \\ 0.23 \\ 0.04 \\ 0.09 \\ 0.06 \\ 0.09 \\ 0.06 \\ 0.09 \\ 0.06 \\ 0.08 \\ 0.12 \\ 0.19 \\ 0.04 \\ 0.17 \\ 0.14 \\ 0.15 \\ 0.19 \\ 0.11 \\ 0.12 \\ 0.15 \\$	20 µm DIF% (%) 291 5.52 2.5 2.5 2.4,42 9.0 7.2 5.2 10.7 7.6 10.7 7.6 10.7 7.6 10.8 15.1 25.54 5.76 22.71 19.15 5.76 23.85 19.90 23.85 15.67 17.45 18.24	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu \ g \ g^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \\ 0.226 \\ 0.093 \\ 0.304 \\ 0.162 \\ 0.234 \\ 0.127 \\ 0.195 \\ 0.061 \\ 0.145 \\ 0.035 \\ 0.133 \\ 0.123 \end{array}$	RSD (%) 17.52 12.14 3.55 10.9 11.2 18.3 21.8 5.8 15.8 15.8 16.4 51.7 28.5 13.5 34.6 17.4 29.6 13.8 22.1 6.90 15.1 4.1 6.90 15.1 4.1 6.2 12.8	Sensitivity (cps/ µ g g ⁻¹) 109 108 137 136 137 136 137 136 137 136 137 150 21 156 182 202 34 26 106 29 180 43 167 55 171 38 169 50 178	$\begin{array}{c} \\ DL \\ (\mu_{BB}^{-1}) \\ 0.004 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.014 \\ 0.006 \\ 0.037 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.0016 \\ 0.003 \\ 0.016 \\ 0.003 \\ 0.029 \\ 0.004 \\ 0.031 \\ 0.003 \\ \end{array}$	AV (μg g ⁻¹) 3.68 0.99 46.47 0.97 0.82 0.78 0.96 0.82 0.78 0.96 0.82 0.78 0.96 0.82 0.78 0.95 0.88 0.94 0.89 0.95 0.73 0.79 0.81	$\begin{array}{c} \text{DIF} \\ (\mu_{BB}^{-1}) \\ 2.94 \\ 0.02 \\ 0.06 \\ 0.67 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.10 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.16 \\ 0.13 \\ 0.20 \\ 0.13 \\ 0.20 \\ 0.16 \\ 0.17 \\ 0.08 \\ 0.00 \\ \end{array}$	10 µm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.1 1.8 27.2 8.94 13.8 20.79 19.76 17.60 27.06 17.60 27.06 17.60 27.06 17.60 27.06 17.60 27.06 17.60 27.06 17.60 27.06 17.60 27.06 17.60 27.06 10.97 10.92 0.05	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu_{g \ g}^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \\ 0.169 \\ 0.386 \\ 0.234 \\ 0.452 \\ 0.172 \\ 0.128 \\ 0.156 \\ 0.194 \\ 0.129 \\ 0.220 \\ 0.117 \\ 0.261 \\ 0.116 \end{array}$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8 12.81 17.7 47.0 35.3 49.0 19.47 13.5 17.7 20.6 14.47 23.2 16.03 33.1 14.4	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 39 81 11 85 99 103 16 14 54 14 54 14 92 22 85 29 90 19 84 24 90	$\begin{array}{c} DL \\ (\mu\varrhog^{-1}) \\ 0.018 \\ 0.014 \\ 0.003 \\ 0.024 \\ 0.024 \\ 0.014 \\ 0.076 \\ 0.010 \\ 0.006 \\ 0.009 \\ 0.146 \\ 0.140 \\ 0.140 \\ 0.105 \\ 0.010 \\ 0.020 \\ 0.105 \\ 0.010 \\ 0.067 \\ 0.010 \\ 0.067 \\ 0.010 \\ 0.006 \\ 0.094 \\ 0.088 \\ 0.089 \\ 0.008 \end{array}$
Sc V B S Y Zr b B Lacer b M m u d b V form b Luff a b	RV (µgg ⁻¹) 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.763 0.777 0.763 0.749 0.746 0.749 0.74 0.777 0.732 0.711 0.808 2.32	AV (µgg ⁻¹) 2.89 0.95 0.78 44.6 0.98 1.06 0.90 2.97 0.76 0.73 0.71 0.67 0.79 0.69 0.88 0.92 0.88 0.92 0.88 0.96 0.85 0.86 0.96 0.85 0.86 0.96 0.85 0.86 0.96 0.85 0.86 0.96 0.85 0.86 0.96 0.85 0.86 0.96 0.85 0.86 0.96 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.93 0.95 0.73 0.73 0.73 0.74 0.75 0.75 0.73 0.77 0.75 0.88 0.92 0.92 0.88 0.92 0.88 0.92 0.85 0.86 0.85 0.86 0.96 0.85 0.86 0.96 0.85 0.86 0.96 0.85 0.96 0.86 0.96 0.85 0.96 0.85 0.96 0.86 0.96 0.85 0.86 0.96 0.85 0.96 0.86 0.96 0.85 0.96 0.86 0.96 0.85 0.96 0.86 0.96 0.85 0.96 0.96 0.96 0.85 0.96 0.85 0.86 0.86 0.86 0.85 0.86 0.86 0.86 0.86 0.86 0.85 0.86 0.86 0.86 0.96 0.86 0.86 0.86 0.96 0.86 0.96 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.96 0.86 0.96 0.86 0.96 0.86 0.96 0.85 0.86 0.8	$\begin{array}{c} \text{DIF} \\ (\mu_{gg}^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.19 \\ 0.21 \\ 0.07 \\ 0.23 \\ 0.04 \\ 0.09 \\ 0.06 \\ 0.08 \\ 0.04 \\ 0.08 \\ 0.12 \\ 0.09 \\ 0.04 \\ 0.17 \\ 0.14 \\ 0.15 \\ 0.03 \\ \end{array}$	20 µm DIF% (%) 291 5.52 8.5 2.5 23.82 9.0 7.2 5.2 10.7 7.6 10.47 5.0 10.8 15.1 25.76 22.71 19.15 19.95 23.85 15.67 17.45 18.24 1.1	$\begin{array}{c} \text{SD} (1 \sigma) \\ (\mu_{g g} g^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \\ 0.226 \\ 0.093 \\ 0.304 \\ 0.162 \\ 0.234 \\ 0.127 \\ 0.195 \\ 0.061 \\ 0.145 \\ 0.035 \\ 0.133 \\ 0.123 \\ 0.319 \end{array}$	RSD (%) 17.52 12.14 3.55 10.9 11.2 18.3 21.8 5.8 15.8 15.8 15.8 16.4 51.7 28.5 34.6 17.4 29.6 13.8 22.1 6.90 15.1 4.1 16.9 12.89 13.59	Sensitivity (cps/ µ g g ⁻¹) 109 130 137 136 73 150 21 156 182 202 34 26 106 29 180 43 167 55 171 38 169 50 178 81	$\begin{array}{c} \\ DL \\ (\mu g g^{-1}) \\ 0.004 \\ 0.006 \\ 0.002 \\ 0.005 \\ 0.014 \\ 0.006 \\ 0.037 \\ 0.005 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.003 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.008 \\ 0.0016 \\ 0.003 \\ 0.016 \\ 0.003 \\ 0.029 \\ 0.004 \\ 0.016 \\ 0.003 \\ 0.029 \\ 0.004 \\ 0.031 \\ 0.003 \\ 0.006 \\ \end{array}$	AV (μg g ⁻¹) 3.68 0.99 46.47 0.97 0.98 0.99 2.79 0.82 0.82 0.82 0.82 0.66 0.92 0.88 0.94 0.89 0.95 0.73 0.79 0.81 2.18	DIF (µgg ⁻¹) 2.94 0.02 0.67 0.18 0.17 0.41 0.01 0.01 0.01 0.01 0.01 0.01 0.01	10 μm DIF% (%) 397 2.357 7.4 1.5 22.791 15.51 20.45 12.8 14.4 1.1 1.8 27.2 8.94 1.3.8 20.79 19.76 27.06 27.24 22.00 0.07 10.92 0.05 5.98	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu_{g \ g} \ ^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \\ 0.169 \\ 0.386 \\ 0.234 \\ 0.452 \\ 0.172 \\ 0.128 \\ 0.156 \\ 0.194 \\ 0.129 \\ 0.220 \\ 0.117 \\ 0.261 \\ 0.116 \\ 0.452 \end{array}$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 18.6 35.8 12.81 17.7 47.0 35.3 49.0 19.47 13.5 17.7 20.6 14.47 23.2 16.03 33.1 14.4 20.7	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 73 39 81 11 85 99 103 16 14 54 14 99 22 85 29 90 19 84 22 85 29 90 19 84 24 90 43	$\begin{array}{c} \\ \textbf{DL} \\ (\mu_{BB}^{-1}) \\ 0.018 \\ 0.014 \\ 0.003 \\ 0.014 \\ 0.024 \\ 0.014 \\ 0.076 \\ 0.010 \\ 0.006 \\ 0.009 \\ 0.146 \\ 0.140 \\ 0.020 \\ 0.105 \\ 0.010 \\ 0.020 \\ 0.105 \\ 0.010 \\ 0.067 \\ 0.010 \\ 0.050 \\ 0.006 \\ 0.094 \\ 0.008 \\ 0.023 \\ \end{array}$
Sc V R Sr Y Zr bb B Lace Pr Nd M E Ud B D H E T M b Lu Hf a b Th	RV (<u>µ g g⁻¹)</u> 0.74 1.01 0.855 45.8 0.79 0.848 0.824 3.2 0.72 0.813 0.768 0.752 0.754 0.77 0.763 0.739 0.746 0.739 0.746 0.739 0.749 0.74 0.732 0.777 0.732 0.777 0.732 0.711 0.808 2.32 0.748	AV (μ g g ⁻¹) 2.89 0.95 0.78 44.6 0.90 2.97 0.76 0.73 0.71 0.67 0.79 0.69 0.88 0.93 0.79 0.88 0.88 0.85 0.84 0.96 0.85 0.84 0.95 0.87	$\begin{array}{c} \text{DJF} \\ (\mu_{E}g^{-1}) \\ 2.15 \\ 0.06 \\ 0.07 \\ 1.2 \\ 0.07 \\ 0.21 \\ 0.07 \\ 0.21 \\ 0.07 \\ 0.04 \\ 0.09 \\ 0.06 \\ 0.08 \\ 0.04 \\ 0.08 \\ 0.04 \\ 0.08 \\ 0.12 \\ 0.11 \\ 0.15 \\ 0.11 \\ 0.15 \\ 0.01 \\ 0.12 \\ 0.15 \\ 0.03 \\ 0.12 \\$	20 µm DIF% (%) 291 5.52 8.5 2.5 23.82 24.42 9.0 7.2 10.7 7.6 10.47 5.0 10.8 15.14 5.76 22.51 19.90 23.85 15.67 17.45 18.24 1.1 16.01	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu_{g \ g} \ g^{-1}) \\ 0.507 \\ 0.116 \\ 0.168 \\ 1.584 \\ 0.107 \\ 0.118 \\ 0.164 \\ 0.648 \\ 0.044 \\ 0.115 \\ 0.117 \\ 0.348 \\ 0.226 \\ 0.093 \\ 0.304 \\ 0.162 \\ 0.234 \\ 0.127 \\ 0.195 \\ 0.061 \\ 0.133 \\ 0.123 \\ 0.319 \\ 0.060 \end{array}$	RSD (%) 17.52 12.14 3.55 10.9 11.2 18.3 21.8 5.8 15.8 15.8 15.8 15.8 15.8 15.8 15	Sensitivity (cps/µgg ⁻¹) 109 108 137 136 73 150 21 156 182 202 34 26 106 29 180 43 167 55 171 38 167 55 1711 38 167 55 1771 38 189 50 178 81 131	DL (µgg ⁻¹) 0.004 0.006 0.002 0.005 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.001 0.004 0.003 0.004 0.003 0.004 0.003 0.004	AV (μgg ⁻¹) 3.68 0.99 46.47 0.92 46.47 0.97 0.98 0.99 2.79 0.82 0.78 0.96 0.82 0.66 0.92 0.89 0.95 0.88 0.94 0.89 0.95 0.73 0.79 0.81 2.18 0.96	$\begin{array}{c} \text{DIF} \\ (\mu_{BB}^{-1}) \\ 2.94 \\ 0.06 \\ 0.67 \\ 0.13 \\ 0.17 \\ 0.41 \\ 0.10 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.00 \\ 0.07 \\ 0.11 \\ 0.20 \\ 0.16 \\ 0.17 \\ 0.20 \\ 0.16 \\ 0.17 \\ 0.00 \\ 0.08 \\ 0.00 \\ 0.14 \\ 0.21 \\ \end{array}$	10 µm DIF% (%) 397 2.35 7.4 1.5 22.79 15.51 20.45 12.8 14.4 1.1 1.8 27.2 8.94 13.8 20.79 19.76 27.06 17.60 27.24 22.03 22.00 0.07 10.92 0.05 5.98 28.66	$\begin{array}{c} \text{SD} (1 \ \sigma) \\ (\mu g \ g^{-1}) \\ 0.792 \\ 0.132 \\ 0.315 \\ 1.410 \\ 0.211 \\ 0.288 \\ 0.173 \\ 0.764 \\ 0.153 \\ 0.294 \\ 0.100 \\ 0.169 \\ 0.386 \\ 0.234 \\ 0.452 \\ 0.172 \\ 0.128 \\ 0.156 \\ 0.194 \\ 0.129 \\ 0.220 \\ 0.117 \\ 0.261 \\ 0.116 \\ 0.452 \\ 0.136 \end{array}$	RSD (%) 21.53 13.4 34.3 3.03 21.8 29.4 17.5 27.4 17.5 27.4 18.6 35.8 12.81 17.7 47.0 35.3 49.0 19.47 13.5 17.7 20.6 14.47 23.2 16.03 33.1 14.4 20.7 14.12	Sensitivity (cps/µgg ⁻¹) 60 70 58 73 39 81 11 85 99 103 16 14 54 14 92 22 85 29 90 19 19 84 24 90 43 70	$\begin{array}{c} DL \\ (\mu g g^{-1}) \\ 0.018 \\ 0.018 \\ 0.018 \\ 0.010 \\ 0.014 \\ 0.024 \\ 0.010 \\ 0.006 \\ 0.009 \\ 0.146 \\ 0.009 \\ 0.140 \\ 0.000 \\ 0.006 \\ 0.009 \\ 0.140 \\ 0.000 \\ 0.005 \\ 0.010 \\ 0.006 \\ 0.098 \\ 0.008 \\ 0.023 \\ 0.010 \\ 0.010 \\ 0.010 \\ 0.010 \\ 0.010 \\ 0.010 \\ 0.010 \\ 0.001 $

RV: reference value of Jochum *et al.* (2011), AV: averaged value of analytical result, DIF: difference from reference value, DIF%: percentage of DIF against RV, SD: standard deviation of analytical values, RSD: relative standard deviation of analytical values, LD: lower limits of detection.

(2011) is shown in Fig. 6b. Accuracy were less than 30 % for all elements and all spot sizes, except for Sc, and the accuracy for most elements with 80 and 40 μ m laser spot diameters was less than 20 %.

The estimated crater depth for analyses of Cpx, Amp, and Pl using the Set 2 program were Cpx 22 μ m, Amp 16 μ m, and Pl 16 μ m for a laser spot diameter of 100 μ m, Cpx 23 μ m, Amp 16 μ m, and Pl 16 μ m for a 40 μ m diameter, and Cpx 23 μ m, Amp 15 μ m, and Pl 16 μ m for a 20 μ m diameter. Thus, penetration would not occur during analyses of thin section samples with

standard thickness (ca. 30 µm).

5. Conclusion

Analytical programs for trace element analysis of microspots in silicate minerals and glasses using LA-ICP-MS at GSJ-Lab were established. From evaluation of exhaustive basic data for He carrier gas flow rates and laser settings for ablation, appropriate instrumental operation settings were set as follows: 0.5 Lmin^{-1} He carrier gas flow rate, 100 µm laser spot diameter, 5 Hz laser pulse repetition rate, and 40 % laser energy (fluence ca. 2.0 J cm⁻²).

To evaluate precision and accuracy, NIST 615 and NIST 613 were analyzed as unknown samples. As a result, reproducibility as precision was mostly less than 30 % for 45 elements from ⁴⁵Sc to ²³⁸U with laser spot diameters ranging from 100 to 10 μ m. Accuracy was evaluated with respect to the DIFs between the analytical results and reference values by Jochum *et al.* (2011). Accuracy for analysis of NIST 613 was DIF < 30 %, except for Sc, Mn, Ni, and Ge. For NIST 615, the DIFs were less than 30 %, except for Tl with laser spot diameters of 20 μ m and 10 μ m, and Cd for a spot diameter of 20 μ m. The crater depth for appropriate analytical conditions for Cpx, Amp, and Pl were estimated from confocal microscopy observations of craters ablated under given conditions, and it was confirmed that penetration of thin section samples with standard thickness (*ca.* 30 μ m) did not occur with laser spot diameters of 100 – 20 μ m.

For the general purpose of petrological and geochemical discussions, two suites of analytical programs (34 and 27 elements; Sets 1 and 2, respectively) were additionally prepared, and their accuracies were evaluated. The DIFs for the suite of 34 elements (Set 1) were mostly less than 30 %, although some (Cr, Mn, Ni, and Cs) with laser spot diameters < 40 μ m exceeded 30 %. In the suite of 27 elements (Set 2), the DIFs were < 30 %, except for Sc.

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Received May 11, 2015 Accepted December 24, 2015 Trace element analyses by LA-ICP-MS (Yamasaki et al.)

レーザーアブレーション誘導結合プラズマ質量分析計(LA-ICP-MS)による ケイ酸塩鉱物及びガラスのための微量元素分析

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要旨

産業技術総合研究所 地質調査総合センター共同利用実験室(GSJ-Lab) 設置のLA-ICP-MSにより, 珪酸塩鉱物及び ガラスの微小領域の微量元素定量分析プログラムを構築した. 検量線作成のための標準試料には, アメリカ国立標準技 術研究所(NIST)の標準ガラス物質(NIST 613 及び 611)を使用し, 妥当な測定条件として He キャリアーガス流量 0.5 L min⁻¹, レーザーのスポット径 100 µm, パルスレート 5 Hz, エネルギー 40 % (fluence ~ 2.0 J cm⁻²)を設定した. 測定精度 検証のため NIST 615 及び NIST 613 を未知試料として測定した結果, ⁴⁵Sc から ²³⁸U までの 45 元素について, レーザース ポット径 100 µm - 10 µm において繰り返し測定精度 (reproducibility; precision) はほぼ 30% 以下であった. 標準試料の 値からの差を示す確度 (accuracy) は, NIST 615 では Sc, Mn, Ni, Ge 以外の元素では, 一般的に定量分析における精 度の許容範囲の目安とされている <30 % を下回り, NIST 613 では, レーザースポット径 20 µm と 10 µm の Tl, 20 µm の Cd を除く全ての元素が 30 % 以下であった. 天然の単斜輝石, 角閃石及び斜長石を測定した際に想定されるレーザーピッ トの深さは, 通常の岩石薄片試料において鉱物の掘り抜きは生じない程度であることが確認された. 一般的な岩石学的, 地球化学的議論に供するために 34 元素, 27 元素を同時に測定可能な 2 つのセットをさらに作成し精度・確度を検証し た結果, 34 元素のセットではレーザースポット径 40 µm 以下の Cr, Mn, Ni, Cs において確度が 30 % を超えるものが いくつかあるが, その他は 30 % 以下であった. 27 元素のセットでは, Sc を除き全てのレーザースポット径で確度は 30 % 以下であった.