

PW6 Accurate and precise elemental abundance of Zn in Standard Reference Materials by Isotope Dilution Mass Spectrometry TIMS Technique.

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Accurate and precise zinc concentrations by IDMS technique using small sample.

In the past, the use of Thermal Ionization Mass Spectrometry has proved to be difficult for low-level zinc isotopic measurements because of the high ionization potential of this element hence the sizes of the Zn samples used for isotopic analyses [1, 2]. A thermal ionisation mass spectrometric technique enabled the abundance of Zn in eleven geochemical, three biological reference materials and four water samples to be measured by isotope dilution mass spectrometry. In particular the biological SRMs, represent a useful break through [3]. The sensitivity of the isotope dilution technique also enabled the concentration of zinc in water samples to be accurately measured at the ngg^{-1} level. These results represent the most accurate and precise concentrations measured for Zn in these samples and, may be up to an order of magnitude less than results obtained using other analytical techniques. The improved precision achieved also enable inhomogeneity of Zn in HISS-1 to be revealed. Other SRMs appear homogeneous within the estimated 95% confidence uncertainty of the final average concentration. Small samples of river water and tap water samples containing ngg^{-1} Zn were also measured demonstrating the techniques applicability for such low level Zn samples.

- [1] Rosman, K.J.R., The Isotopic and Elemental Abundance of Zinc in Terrestrial and Meteoritic Matter. 1972, University of Western Australia: Perth. p. 201.
- [2] Ghidan, O.Y., The Isotopic composition of Zn in natural materials, in Department of Imaging and Applied Physics. 2008, Curtin University of Technology: Perth. p. 248.
- [3] Ghidan, O.Y.A. and R.D. Loss, Geostandards geoanalytical research, Submitted.