

GSI REFERENCE MATERIALS FOR “NATIONAL GEOCHEMICAL MAPPING PROGRAM” NEW ANALYTICAL DATA FOR INDIUM, THALLIUM, MOLYBDENUM, TUNGSTEN, TIN, CESIUM AND LITHIUM BY UTILIZING ACID DECOMPOSITION PROCEDURE

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Abstract

Indium (In), thallium (Tl), molybdenum (Mo), tungsten (W), tin (Sn) and cesium (Cs) are determined by Inductively Coupled Plasma Mass Spectrometry and lithium by flame AAS technique in three in-house geochemical reference materials of the Geological Survey of India. The acid decomposition procedure involving aqua regia, HF and perchloric acids had been utilized for the complete decomposition of the samples. Rhodium has been added as an internal standard to correct matrix effects and instrumental instability. Several stream sediment and soil reference materials were used for the calibration of the instrument. The accuracy and precision of the experimental values were assessed by the comparative analysis of well established reference materials such as IGGE, GSD-2, GSD-3, GSD-4, GSD-5, GSD-6, GSD-10 and GSS-8. The results obtained for the reference materials are in good agreement with the recommended values.

Reliable new data for In, Tl, Mo, W, Sn, Cs and Li in the three geochemical reference materials, PKS-1 (Palakkad Kerala Soil-1), PKSS-1 (Palakkad Kerala Stream Sediment-1), AASS-2 (Anantapur Andhra Pradesh Stream Sediment-2) prepared by Geological Survey of India had been reported for the first time. The indicative values for PKS-1 are; In 0.07 ± 0.01 $\mu\text{g/g}$, Tl 0.38 ± 0.03 $\mu\text{g/g}$, Mo 2.08 ± 0.23 $\mu\text{g/g}$, W 0.58 ± 0.15 $\mu\text{g/g}$, Sn 4.35 ± 0.57 $\mu\text{g/g}$, Cs 1.00 ± 0.03 $\mu\text{g/g}$, Li 13.8 ± 1.7 $\mu\text{g/g}$, & for PKSS-1 are; In 0.06 ± 0.01 $\mu\text{g/g}$, Tl 0.14 ± 0.02 $\mu\text{g/g}$, Mo 1.29 ± 0.17 $\mu\text{g/g}$, W 0.33 ± 0.02 $\mu\text{g/g}$, Sn 1.29 ± 0.17 $\mu\text{g/g}$, Cs 0.30 ± 0.01 $\mu\text{g/g}$, Li 8.42 ± 0.91 $\mu\text{g/g}$, & for AASS-2 are; In 0.015 ± 0.005 $\mu\text{g/g}$, Tl 0.97 ± 0.05 $\mu\text{g/g}$, Mo 0.47 ± 0.09 $\mu\text{g/g}$, W 0.34 ± 0.10 $\mu\text{g/g}$, Sn 0.54 ± 0.13 $\mu\text{g/g}$, Cs 1.68 ± 0.05 $\mu\text{g/g}$, Li 8.84 ± 0.96 $\mu\text{g/g}$. These geochemical reference materials are intended to be used for the calibration of measuring apparatus, evaluation of analytical methods, certification studies, quality control and laboratory accreditation programmes.

Key words: Trace elements, ICPMS, Flame AAS, acid decomposition procedure, geochemical reference materials, Geological Survey of India