

COMPARISON OF DETECTION LIMITS FOR PLATINUM – GROUP ELEMENTS (PGE’S) BY NICKEL SULFIDE FIRE-ASSAY AND TE CO-PRECIPI-TATION METHOD WITH ICP-MS USING 99.995% NI POWDER (<150 MESH), 99.995% NI GRANULES AND NICKEL CARBONATE

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Abstract

Comparison of detection limits for the determination of platinum group elements (PGE’s) using inductively coupled plasma mass spectrometry (ICP-MS) was done, after pre-concentration by nickel sulfide fire-assay technique and Te co-precipitation to enhance recovery. The results of the study using 99.995% pure Ni powder (<150mesh), 99.995% purity Ni granules and Nickel carbonate (minimum assay as Ni 40-45%) are presented in the paper. Heterogeneous distribution of PGE’s in geological samples is over come by small particle sizes (<200 mesh) and rigorous homogenization/re-homogenization procedure. By optimizing critical parameters such as flux composition, controlled furnace temperature and instrumental drift, etc., best experimental conditions were established to develop a method suitable for routine analysis. Calibrations were performed using synthetic standards and verified by the use of international PGE’s reference materials, WMG-1 and CHR PT+. This economically viable improvised procedure offers extremely low detection limits in the range of 0.3 to 5.0 ng/g by using 99.995% Ni powder. The analytical methodology described here can be used for routine analysis of PGE’s in geological samples.

Keywords: Platinum Group Elements (PGE’s), NiS fire-assay, ICP-MS, Nickel sulfide, Nickel carbonate