DETERMINATION OF PLATINUM-GROUP ELEMENTS IN GEOLOGIC SAMPLES BY MICROWAVE DIGESTION AND ICP-HEX-MS

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Recent price trends of the precious metals (decreasing gold prices and increasing palladium prices) have sparked a renewed interest in exploration for the platinum-group elements (PGEs). Geochemical exploration is hindered by the lack of rapid, inexpensive, and accurate analytical methods for the PGEs. This paper describes a combination of microwave digestion to solubilize the difficultly-soluble platinum-group minerals and inductively-coupled plasma-mass spectrometry to quantify the PGEs. Microwave digestion is carried out in two steps to insure the dissolution of chromite, magnetite, and sulfides at 240C in hydrochloric and nitric acids. ICP-MS involves correction for oxide and doubly-charged ion species and a hexapole collision cell suppresses potentially-significant copper and zinc argide interferences.