DETERMINATION OF PLATINUM GROUP ELEMENTS IN SOIL AND PLANT SAMPLES BY ELECTROTHERMAL ATOMIC ABSORPTION SPECTROMETRY IN IOANNINA (N.W. GREECE)

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The increasing use of automobile catalysts leads to the emission of platinum-group elements (PGEs), mainly platinum, palladium and rhodium in the environment. To account for PGEs accumulation, soil and plant samples were analysed and characterized in detail through an annual survey in Ioannina city (NW Greece). The determination of PGEs was achieved with electrothermal atomic absorption spectrometry (ET-AAS) [1]. Sample preparation involved complete microwave-assisted acid digestion of the matrix with HNO₃–HF mixtures in high-pressure Teflon bombs [2]. Concentrations of Pt, Pd, Rh in plant samples taken from areas of variable traffic flows and driving conditions show that high concentrations of PGEs are associated with high traffic densities. Samples taken from streets of lower traffic flows were found to contain the lower concentrations [3]. Soil concentration levels were ranging from 35-113.2 ng/g, 4.9-14.0 ng/g and 10.0-25.4 ng/g, for Pt, Pd and Rh, respectively. In plant samples, collected from the same areas, PGE levels were from 2.1–6.2 ng/g, 0.82-2.61 ng/g and 1.29-3.89 ng/g, for Pt, Pd and Rh. Both spatial and seasonal effects on PGEs transportation from soil to plants were observed and an attempt to relate transfer factors as a function of soil matrix composition was attempted.

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