

SUMMARY

An improved traditional Ni-S fire-assay separation procedure for ICP-MS analyses of platinum group elements (PGE) has been revisited with the aim of reducing value of blank samples and application for monitoring of ultratrace concentration of PGE in sixteen peat sample layers. The dry ashed samples were mixed with fluxes and collector (Ni+S) thoroughly in a fire-clay crucible, and the fusions were done in a temperature controlled muffle furnace. Mechanically separated Ni-S button were then selectively dissolved in (i) HCl and (ii) HCl+H₂O₂ and the final solution (containing PGE) was dissolved in 1M HCl. All samples were further diluted and then measured with using ICP-MS. The detection limits were low and varied from 0,000024 ppm (for Rh) to 0,0002 ppm (for Pd). The analyses of peat profile samples yielded an analytical precision of 1,5-10 % (RSD) for Ir and Pt and 3-20% for Ru, Rh and Pd in most cases. External reproducibility of this method was monitored using WMG-1 reference material (CCRMP, Canada). No effect of spectral interferences on the determination of PGE was observed in the analysis of peat samples.

The measured PGE data display a wide range of concentrations, from 0,00046 ppm to 0,001 ppm for Ru, from 0,000024 ppm to 0,0023 ppm for Rh, from 0,0002 to 0,024 for Pd, from 0,00004 ppm to 0,0018 ppm for Ir and 0,000086 ppm to 0,054 ppm for Pt. Generally, the concentration patterns of PGE exhibit increasing trend from the second half of 20th century. Values 0,024 ppm for Pd and 0,054 ppm for Pt from the upper part of the studied peat profile represent remote values and the contribution of PGE (in pollution) from near base-metal metallurgical works and/or automobile catalytic converters is not evident. Due to decreasing concentration values in the upper layers of profile we presume possible leaching of PGE from the upper layers (e. g. owing to precipitations).