

A 50-year record of PGEs in Antarctic snow

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Antarctic snow preserves an atmospheric archive that enables the study of global atmospheric changes and anthropogenic disturbances from the past. We report atmospheric deposition rates of platinum group elements (PGEs) in Antarctica during the last ~50 years based on determinations of Pt, Ir and Rh in snow samples collected from Queen Maud Land, East Antarctica to evaluate changes in the global atmospheric budget of these noble metals. The 50-year average PGE concentrations in Antarctic snow were 17 fg g⁻¹ (4.7–76 fg g⁻¹) for Pt, 0.12 fg g⁻¹ (<0.05–0.34 fg g⁻¹) for Ir and 0.71 fg g⁻¹ (0.12–8.8 fg g⁻¹) for Rh. The concentration peaks for Pt, Ir and Rh were observed at depths corresponding to volcanic eruption periods, indicating that PGEs can be used as a good tracer of volcanic activity in the past. A significant increase in concentrations and crustal enrichment factors for Pt and a slight enhancement in enrichment factors for Rh were observed after the 1980s. This suggests that there has been large-scale atmospheric pollution for Pt and probably Rh since the 1980s, which may be attributed to the increasing emissions of these metals from anthropogenic sources such as automobile catalysts and metal production processes.

Geochemistry and distribution of total heavy mineral concentrations of beach sediments of the Sakarya Delta (SW-Black Sea)

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This study aims to investigate geochemistry and total heavy mineral distributions of marine beach sediments of the Sakarya Delta (SW-Black Sea, Turkey) where some higher metal contents were reported in sediments and related to possible occurrences of beach placers. With support of TÜBİTAK (Project No: 108Y333) and Ankara University-Sci. Res. Pro. Of. (Project 20070745007HPD), 48 surficial sediment samples were collected from the coastal beaches of Sakarya Delta representing modern shoreline and backshore sub-environments. In addition to geomorphological field observations, multielement and grain size analysis as well as total heavy mineral determinations are performed. Multielement geochemistry was carried out using ICP-MS method. Preliminary results showed that beach bulk sediments of the Sakarya Delta generally contained similar amounts of Ti, Pb, U, Mg and Sn compared with average rock composition of Earth's crust. The concentrations of As (6-24 ppm), Sb (0, 3-2, 1ppm), Ca (2-9 ppm), Cr (17-3999 ppm) were comparatively higher whereas Cu (6-27 ppm), Mo (0, 1-0, 7 ppm), Sn (0, 4-5, 2 ppm), Y (5-27 ppm), Nb (4-36 ppm) and Ta (0, 3-2, 5 ppm) contents are lower. Elements Cr, Fe, Mn, Co, Ni, Nb, Y and Ce reached their highest concentrations in sediments collected close to the Sakarya River mouth. The total heavy mineral concentrations of the bulk sediments are generally low, with except of 3 samples which contained highest total heavy mineral concentrations (70-95 %). The locations of these 3 samples were also aligned to or towards the river mouths.