BIOGEOCHEMISTRY OF SILVER, PLATINUM AND PALLADIUM

KOVALEVSKII A. L., KOVALEVSKYA O. M., Prokopchuk S. I.
Geological Institute, Siberian Branch of the Russian Academy of Sciences, Ulan-Ude, 670047, Russia.

Lithobiogeochemical investigations of Ag since 1984 and platinoids since 1987 on the basis of more than 120 000 determinations of Ag and more than 16 000 of Pt and Pd established the basic features of their accumulation by plants. Similar features are: 1) Non-barrier accumulation of Ag, Au, Pt, Pd in old parts of plants – the external layers of the bark of trunks and the wood of old stumps; 2) Formations of microbioliths Ag, Au, Pt, Pd, Ir, Os, Rh, Ru in old suberized and lignificated parts of plants. It makes possible to use automated scintillation emission spectral analysis. 3) Much more uniform distributions of Ag, Au, Pt, Pd in ash of plants, than in samples of rocks and ores. It furnishes an opportunity to use samples of plants small by weight for their determination. Features of differences are: 1) Background-barrier accumulation of Ag by young growing parts: leafs, sprouts and branches of trees and bushes and often non-barrier accumulation of Pt and Pd by them. 2) Much more intensive absorption of Ag in the non-barrier bioobjects (plant-soil coefficient – PSC=10-40, about 20 on the average), than Pt and Pd (PSC≈1,0) at their low contents in soils. Significant reduction of Ag PSC at its ore concentrations in soils and rocks (up to PSC≈1,0) and affinity of PSC values for Ag, Pt, Pd in the wood of pine (*Pinus silvestrics*) rotten stumps and in the bark of trunks and stumps of the pine at ore concentrations in soils and rocks (PSC≈1,0). While interpreting the analytical data it is necessary to notice that Ag, Pt, Ir, Os, Pd, Au form monoelemental lithobiogeochemical anomalies in their complex thickenings. Hg, Pb, Zn, Cu, Fe, Mo, F and other elements are used to define genetic, mineral and technological characteristics of ore mineralization.