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## Geochemical study in situ (LA-ICP-MS) of ore minerals from Paleoproterozoic layered PGE intrusions in the north-eastern Fennoscandian Shield

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The laser ablation inductively-coupled plasma mass spectrometry (LA-ICP-MS) is a unique method for local analysis that allows studying mineral grains in situ. The aims of these geochemical researches are to estimate concentrations and distributions of PGE and other siderophilic and chalcophilic elements in ore minerals from complex deposits in the Arctic region (Fennoscandian Shield), using the LA-ICP-MS local analysis of trace elements. Pyrite, pentlandite, pyrrhotite and other sulfides are important for determining platinum-group elements.

In situ analyses of sulfide crystals were carried out on polished thin sections by ICP-MS. The electron (LEO-1415) and optic (LEICA OM 2500 P, camera DFC 290) spectroscopy was applied to study the morphology of the samples. Analytical points on sulfide minerals were selected using microelectronic and optical images.

PGE and other elements (As, Bi, Cd, Cr, Co, CuFe, Ni, Se, S, Sn, Sb, Pb, Re, Te, Tl, Zn, Hf, Th, U, REE) were measured by ICP-MS, using an ELAN 9000 DRC-e (Perkin Elmer) quadrupole mass spectrometer equipped with a 266 nm UP-266 MACRO laser (New Wave Research). NIST 610, NIST 612 and tandem graduation (using solutions), considering sensitivity coefficients of isotopes were used to check the accuracy of estimations. Fe, Ni and Cu were used as internal standards, being most evenly distributed elements in minerals, when concentrations of elements in sulfides were calculated. The estimates were carried out, using inter-laboratory standards of chalcopyrite, pentlandite and pyrrhotite, which had been preliminarily prepared and studied using microprobe analysis (Cameca MS-46).

Data on concentrations of PGE, Au and Ag in sulfides, including data on their distribution in minerals, are crucial in studying the origin of noble metals in sulfide ores and interpreting formation settings of complex deposits. Estimated concentrations of other trace elements provide an essential supplement to geochemical data. Received data are new data (LA-ICP-MS) of Pt-Pd and Cu-Ni reefs of the Monchegorsk ore areas (2.5 Ga) with prospected commercial deposits. Elaborated LA-ICP-MS techniques were applied to provide in situ measurements of noble metals (PGE, Au, Ag), as well as siderophilic and chalcophilic elements, in sulfide minerals in order to study

their distributions in chalcopyrite, pentlandite and pyrite from the Pechenga and Allarechka Cu-Ni deposits (1.98 Ga), Fedorova Tundra and Severny Kamennik PGE deposits (2.5 Ga).

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