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Geochemical study *in situ* (LA-ICP-MS) of ore minerals from Paleoproterozoic multimetal (PGE, Cu-Ni) deposits in the Arctic region (Fennoscandian Shield)

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The laser ablation inductively-coupled plasma mass spectrometry (LA-ICP-MS) is a method for *in situ* analysis. The aims of these geochemical researches are to determinate concentrations and distributions of PGE and other siderophilic and chalcophilic elements in ore minerals from multimetal (PGE, Cu-Ni) deposits, using the LA-ICP-MS local analysis of trace elements. Pyrite, pentlandite, pyrrhotite and other sulfides are important for determining platinum-group elements.

PGE and other elements 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). *In situ* analyses of sulfide crystals were carried out on polished thin sections, analytical points on sulfide minerals were selected using microelectronic and optical images. NIST 610, NIST 612 and tandem calibration (using solutions), considering sensitivity coefficients of isotopes, were used to check the accuracy of estimations. Fe, Ni and Cu were used as internal standards, when concentrations of elements in sulfides were calculated. The estimates were carried out, using inter-laboratory standards of chalcopyrite, pentlandite and pyrrhotite, which before had been 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. The obtained 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. 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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