

## **Bi-cycles petrographic association in middle part of East Pana PGE layers deposit**

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The PGE mineralization in the East Pana layered gabbroic intrusion forms three discrete layers at different stratigraphic levels, which are traditionally labeled as zones A, B and C. In order to investigate possible relationships of mineralization with magmatic layering we sampled a 120 m long drill core section across zone B in the middle part of the intrusion and carried out detailed petrographic, mineralogical and geochemical studies of the samples.

The ore zone <B> is located in medial part of the of East's Pana deposit. The samples represent mainly from a layered sequence of gabbro and gabbro-norite. This zone is composed of interlayers of gabbroic sequences and gabbro-norite of various color, with different structures and different relationship of rock-forming minerals of Ol-Opx-Cpx-Pl. We studied one of key's drill-hole section of ore zone, in which is located two ore horizons.

Fundamental feature layered intrusions are presence in cross-section cycles includes of stable petrographic association. In section of ore zone <B> it is possible to select two most contrast petrographic types.

Whole-rock analyses and petrographic observations reveal two units of modal layering comprising, from bottom to top, melanocratic gabbro grading upwards into mesocratic gabbro and gabbro-norite overlain by pegmatoidal, gabbroic rock with has sharp footwall and hanging wall contacts. There is also an olivine-bearing gabbro at the bottom of the lower unit.

The ore horizons are located in same gabbro-norite type rock. The ore horizons are located in same gabbro-norite type part. The second upper ore zone located in more differential species types.

There is the common trend of system evolution of well distinguished on triangle of Ol-Pl-Di, Ol-Pl-Q and other. However composition of the rocks in the two parts of our section show us similar, but independent trends. For example on diagram differentiation of rocks composition, with normative content of anorthite on the X axis, trends of concentration Sr, Ba, Ni, Co form two parallel lines.

These facts is a well evidence of the hypothesis of independent consequences portions of primary melts. Under this hypothesis the differentiation of such portions of the melts proceeds independently within limited isolated subhorizontal zones of intrusion

Electron microprobe and laser ablation ICP-MS analyses revealed variations in mineral compositions (cryptic layering), which generally correlates with the modal layering.

In the lower unit, there is a general trend of increasing Mg# of clinopyroxene coupled with increasing An content in plagioclase. In the upper unit the Mg# of clinopyroxene decreases at approximately constant plagioclase composition. The mineral compositions vary broadly within each individual sample, probably implying extensive re-equilibration of cumulus minerals with intercumulus liquid.

The modal and cryptic variations, which we observed, are consistent with the idea of multiple magma injections and formation of the layered sequence by fractional crystallization of the repeatedly injected small magma batches. Proposed hypothesis allows to explain the nearby level of content of rare elements in rocks of different steps of fractionation in different portions of intrusion cut.

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