ON THE ORIGIN OF PLATINUM-BEARING LOWER LAYERED HORIZON (LLH) OF THE WEST PANSKY TUNDRA INTRUSION, RUSSIA

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The Lower Layered Horizon (LLH) occurs as a 50 – to 100m thick interval within gabbronorite of the West Pansky intrusion which contains distinct alternation of complementary leucocratic and melanocratic cumulate rocks. In comparison to underlying gabbronorite, rocks of the LLH are characterized by (1) an abrupt disappearance of cumulus clinopyroxene; (2) a significant increase in An content of plagioclase (3) a reduction in f# ratio of orthopyroxene, and (4) a pronounced step-like increase in the whole-rock chromium content. Oxide-sulphide mineralization with high PGE is associated with leucogabbro and anorthosite layers. The origin of the LLH is interpreted to be a result of unstable crystallization caused by a new magma pulse similar in composition to the parental melt. Magma mixing would explane a shift of the melt composition in the bottom zone of crystallization from Opx+Cpx+Pl+L “eutectic” to Opx+Pl+L cotectic and an abrupt increase of An and f# in plagioclase and orthopyroxene. The crystallization is supposed to have taken place not far from the bottom part of magma chamber and was discontinuous. Separation of plagioclase from pyroxene during crystal settling on the temporary floor of the magmatic chamber likely led to the formation of rhythmic anorthosite-norite-pyroxenite layering. The origin of platinum mineralization is attributed to the separation of the immiscible oxide-sulphide liquid from the intercumulus melt trapped in anorthositic cumulates. High concentration of PGE in the oxide-sulphide liquid is due to its formation from the metal-sulphide clusters which came into equilibrium with large volumes of silicate magma prior to being buried within the cumulus pile.