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Kontay intrusion (Polar Siberia)- an example of strong magmatic differentiation in the single magmatic body

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Kontay intrusion is located in the north-west part of Maimecha-Kotuy province, (part of Siberian Large Igneous Province) in the northern part of the Siberian Platform. Intrusion is fully overlaid and practically not studied before. Geophysical data evident that intrusion has form of laccolite with diameter ∼7.5 km and thickness ∼ 2.5 km [1]. Initially lower part of intrusion was described as "gabbro-anortozite and anortositic gabbro" and higher part – as "leucocratic granophyric anortosites" [2].

Complex mineralo-petrological-geochemical study allow to divide intrusion section on three zones: **Lower zone** (below 1100 m) - layered sequence of leucocratic and melanocratic of biotite- and ortopyroxene-bearing gabbro, with minor alkaline feldspar, **Middle zone** (1100-700m) - biotite- and K-feldspar bearing gabbro and monzonotes, interstitial space often contain micrographical structures. Biotite corroded clinopyroxene and form interstitial crystals and **Upper zone** (700-214 m) - petrographically monotone porthyric quartz-monzonites and granosyenites with rare phenocrysts of plagioclase, magnetite, clinopyroxene and biotite. The main secondary minerals are albite, amphibole (edenite-feroedenite), secondary biotite, chlorite, and F,Al-bearing titanite.

Rocks of the all parts fall in the same trends on the binary petrochemical diagrams, they belong to the High-K calc-alkaline seria. They are clearly more alkaline then intrusions of Norilsk district and less alkaline then alkaline-ultramafic intrusions of Maymecha-Kotuy province.

Volcanic rocks of Norilsk and Maymecha-Kotuy area was subdivided for four geochemical types, mainly by the Ti-content, Th/U, Gd/Yb and Sm/Yb ratio: Low-Ti-1 (predominated), Low-Ti-2 (well –developed in Norilsk region), Moderate-Ti (developed only in the lower part of volcanic formation in Norilsk region), High-Ti (rare in Norilsk region, but widely spread in Mailecha-Kotuy area) [3]. Kontay intrusion rocks belong to Moderate-Ti group. The closest analog is Ivakinsky-1 subsute.

Cumulus minerals composition changed systematically upward.

Two populations of clinopyroxene occur, both are diopside-hedenbergite. The pyroxenes of first population contain 1-1.2% $TiO_2$2-2.5% Al_2O_3 0.2-0.3 % MnO, 0.3-0.35% Na_2O, Mg/(Mg+Fe)=0.44-0.50 present only in the lower part of intrusion. These pyroxenes was formed from the melt of High-Ti geochemical type; the second population of pyroxene present overall, Mg/(Mg+Fe) decrease from 0.7 to 0.63, concentration of Al_2O_3 increase from 0.7 to 1.3, TiO_2 increase from 0.4 to 0.6, MnO from 0.4 to 0.7 and Na_2O decrease from 0.32 to 0.28 wt%.

Biotite Mg/(Mg+Fe) increase from 0.60-0.62 up to 0.76-0.78, TiO_2 content decrease from 5 -6.2% to 1.9-2.4%, and MnO content increase from 0.1 to 0.3-0.4%.

Plagioclase in the lowest part of intrusion contains An_{60}-An_{45} cores and An_{32}-An_{26}rims, but in the middle and upper zone plagioclase composition of plagioclase changed systematically with an increase in Ca.

Based on the petrochemical and mineralogical data, Kontay intrusion is an example of strongly in-situ differentiated layered intrusion, formed in subvolcanic conditions form the subalkaline moderate-Ti melt with admixture of crystals, genetically linked with high-Ti melts.

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