

Geochemistry and tectonic position of magmatic rocks in the Arctic zone of the Siberian traps province

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An origin of the Siberian traps province has been discussed for a long time, but not a single model is fully consistent with geological data [1,2]. This is partly due to the lack of geochemical data on magmatic rocks in Arctic zone, the Taimyr peninsula and North Siberian platform subdivided by the Yenisey-Khatangsky trough (Fig.1). The first geochemical data on its volcanic and intrusive rocks includes 160 analyses XRF+ICP MS and 20 isotope data, Sr, Nd, Pb.

Volcanic rocks in the Taimyr peninsula were subdivided in Syrdasaysky, Verkhnetamsky, Labaksky, Zverinsky, Betlingsky, and Ayatarinsky formations [3]. The Syrdasaysky formation consist of trachybasalts with low MgO (3-4 wt.%), $(Na_2O+K_2O)=6$ wt.%, TiO_2 (2.5-3.5 wt.%), and $(Gd/Yb)_n$ ratio >2 . It is a complete analogue of the Ivakinsky formation (Fig.2) in the Norilsk area (P_3). The Verkhnetamsky and Labaksky formations are similar to the Syverminsky formation in the Norilsk area $(Gd/Yb)_n=1.6-1.7$ but characterized by low $TiO_2=1$ wt.%. Upper formations in the Taimyr peninsula correspond to the Kharaelakhsky and Kochechumsky formations in the Norilsk area and Tunguska syncline, respectively. Both are represented by tholeiitic basalts with $(Na_2O+K_2O)=3$ wt.%, $MgO=6-7$ wt.% and $(Gd/Yb)_n=1-1.2$. Intrusive sills of subalkaline and normal alkalinity are widespread in the West Taimyr peninsula, while large layered intrusions occur in its central and eastern parts.

These two types of basalts are located in rift zone and around the whole province (Fig.1). Paleo profiles reconstruction in combination with the geochemical data will make it possible to identify the most significant periods in the geological history of the region development. This approach will help to define the aspects of the eruption time which can be a clue for more reliable ore deposits forecast.

References

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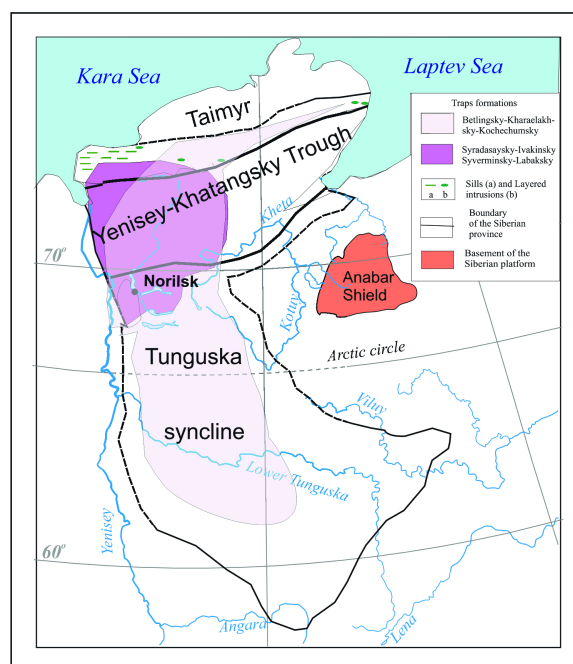


Fig.1. Distribution of main formations within the Siberian province

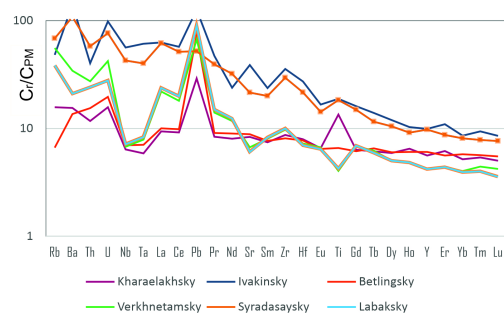


Fig.2. Spider-diagrams for volcanic rocks (normalized to PM; Hofmann, 1988)