

Nature of the Kolyma Tectonic Block Based on the Study of Magmatism

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Magmatism and metallogeny of the northwestern Pacific mobile belt are determined by collision between the Verkhoyansk margin of the Siberian continent and the Kolyma tectonic block. The nature of the block still remains a controversial problem of the geology of northeast Asia. It was considered as part of the Kolyma-Omolon median massif; as an eugeosyncline developed over oceanic or transition-type crust; or as heterogeneous superterrane accreted to the Siberian platform margin in post-Bathonian time.

Within the limits of the region, Late Proterozoic - Early Paleozoic (910-590 Ma) crystalline schists, gneiss-granites, granites, metabasalts, metagabbroids, and metahyperbasites are exposed at the surface. Ultrabasic and basic rocks are represented both by calc-alkaline diopside-olivine normative and Na-alkaline nepheline-olivine normative varieties. They contain more ferruginous olivine and pyroxene, as compared to ophiolites, and are enriched in K, Li, Rb, Ba, Sr, Ce, La, and Nd. Their main parameters correspond to magmatic rocks of back-arc or internal ocean basins initiated on thin continental crust. The granites belong to the trachytic magmatic series and the rapakivi-granite geochemical type and are comparable to A-type continental intraplate granites. Compositionally similar granites, granite-gneisses, and crystalline schists are found in xenoliths of magmatic rocks in adjacent areas of the Verkhoyansk continental margin.

In view of the above data and the similarity of the Early Paleozoic rocks of these structures in lithological composition, one can conclude that the Kolyma tectonic block once formed part of the eastern continental margin of Siberia which was detached from it in course of Paleozoic rifting. Further development of the structure occurred on thin continental crust of broken integrity due to formation of rift-related depressions - small ocean basins.