

HIGH-PRESSURE BASIC-ULTRABASIC COMPLEXES OF SIBERIAN PLATFORM BASEMENT (SOUTH-EAST OF RUSSIA)

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Numerous massives of high-pressure basic-ultrabasic rocks marking the Siberian platform boundary with folded frame have been recognized. They are also fixed by positive gravitation anomaly along whole margin from northwest to southeast.

The mineralogical compositions of these rocks correspond to eclogite, basic garnet granulite, garnet pyroxenite, and garnet lherzolite. The large blocks (up to 200 square km) or layers occur within cyanite-garnet gneiss, garnet amphibolites and marbles.

Mineralogical and geochemical patterns show distinct origin of these high-pressure complexes. Peridotites of Igil' massif (Kansky Precambrian block, southwest part of Siberian platform basement) are mantle fragment whereas the protoliths most of the others high-pressure complexes are mafic-ultramafic rocks emplaced into continental crust most probably prior metamorphic events.

Garnet lherzolites of Igil' massif have such and slightly lower CaO, MgO, Al_2O_3 , TiO_2 and REE contents than primitive mantle. Primary mineral relicts are pyrope garnet (up to 70 % pyrope mineral) + clinopyroxene + orthopyroxene + olivine. During exhumation garnet was replaced by kelyphitic assemblages of two pyroxenes and spinel. Primary assemblages crystallized at 1000 °C and 30 kbar. Garnet peridotites and pyroxenites of Biryusa Precambrian block show a wide range in CaO, Al_2O_3 and TiO_2 contents and possess moderately fractionated REE patterns. Relicts of primary olivine, orthopyroxene, clinopyroxene and chrome-spinel are barely preserved. Prograde metamorphic assemblages are pyrope-almandine garnet, enstatite and diopside. P-T estimates of high-pressure metamorphism yield temperature ranging from 800 to 900 °C and pressures of 19-23 kbar.

The largest on Siberian platform basement high-pressure block of basic rock are Malo-Tagul'sky massif. Transformation of mineral parageneses from gabbro to eclogite observed in this block corresponds to pressure ranging from 8 to 18 kbar. Investigation of high-pressure complexes of Siberian platform basement provides a window into history of lithosphere tectonic development.