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Mineral microstructures in granulites of Angara-Kan uplift (Enisey Ridge, Russia) and some aspects of PT – estimates

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Angara-Kan uplift is located in southern part of Enisey Ridge (SW of Siberian platform). It includes Kan granulite complex, Enisey and Yuksei complexes metamorphosed at lower PT conditions. Age of granulite metamorphism is 1.9 Ga. Kan granulite complex is consist of alternated metaigneous and metasedimentary rocks. Metasediments are represented by hyperstene-biotite, garnet-cordierite-sillimanite and hyperstene-biotite-cordierite gneisses, metaigneous rocks by garnet-hyperstene-plagioclase, garnet-two-pyroxene and garnet-two-pyroxene-hornblende gneisses.

In granulites with association Opx+Cpx+Grt+Pl+Qtz+Ilm mineral microstructures are common. Fine-grained garnet rims are located around plagioclase and orthopyroxene. Garnet contains myrmecite-like inclusions of quartz and ilmenite. Mg number of clinopyroxene is 62-73, orthopyroxene – 52-54. Clinopyroxene contains 0.36-0.53 wt. % of Na2O. Composition of garnet is Alm0.60-0.63Py0.18-0.15Grss0.18-0.19Spss0.01, xAn in plagoclase is 46-50 in center of grain and decreases sharply to 35-32 on rim. Appearance of garnet can be related to reaction Opx+Pl50 → Grt+Qtz+Pl35 which occurs at increasing pressure or decreasing temperature. For PT estimates associations Cpx+Opx+Pl50 and Grt+Pl35 should be used separately.

Granulites with association Hbl+Opx+Cpx+Grt+Pl+Qtz+Ilm located in the same place have granoblastic structure without garnet rims. Garnet form idiomorphic grains with myrmecite-lice inclusions of quartz. Amphibole is represented by tschermakite with Mg number 58-61. xAn in plagioclase is 45-48 with slight increasing from center to the rim of grain. We suppose that absence of garnet rims and sharp zoning in plagioclase may be an indicator of more evolved reaction in this granulite compare to other associations. Thus, these rocks are more acceptable for PT-estimates of final stage of metamorphism. Obtained PT – estimates are about 850 degrees Celsius and 10 kbar.
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