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Application of garnet chemistry in thermodynamic studies of Dehnow Tonalite (Northwest of Mashhad)

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Abstract: Hornblende biotite bearing tonalite from the west of Dehnow comprises of quartz, calcic plagioclase (andesine-labradorite), garnet (mostly almandine), biotite (annite to siderophyllite), calcic amphibole (mainly ferrohornblende) and accessory minerals of chlorite, epidote, calcite and ilmenite. According to thermobarometry of amphibole, plagioclase as well as the chemistry of garnet that shows CaO content of about 4.91-5.48 wt% and MnO content of about 1.89-2.40 wt%, the garnet in tonalite has crystallized in the temperature and pressure range of 696 to 950°C and 6.4 to 12 kbar, respectively, and which is in a greater depth than that of amphibole and plagioclase.

Keywords: *Tonalite; Temperature; Pressure; Garnet; Dehnow; Mashhad.*

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