

The origin and stability of sodicgedrite in ultrahigh-temperature metamorphic rocks from southern India

Tomohito Kanazawa[1]; # Toshiaki Tsunogae[1]; Kei Sato[2]; M SANTOSH[3]

[1] Univ. Tsukuba; [2] Earth Planetary Sci., Tokyo Inst. of Tech.; [3] Natural Environmental Sci., Kochi Univ

Mg-Al-rich rocks from the Palghat-Cauvery Shear Zone System (PCSZ) within the Gondwana suture zone in southern India contain sodicgedrite with up to 3 wt.% Na₂O, which is texturally the prograde to peak phases stable at T = 900-990 °C ultrahigh-temperature metamorphism. The Na content of gedrite adjacent to garnet increase from the core to the rim, suggesting the progress of the decomposition of gedrite + kyanite and formation of sodicgedrite + garnet + cordierite at prograde stage. High-P-T experiments at 12 kbar and 1000 °C indicate that gedrite and melt are stable phases at the P-T condition. However, the product gedrite is nearly Na-free. In contrast, the matrix glass contains up to 8.5 wt.% Na₂O, suggesting that Na was partitioned into the melt rather than gedrite. The results therefore imply that the occurrence of sodicgedrite in the UHT rocks of the PCSZ is probably due to the low H₂O activity during peak P-T conditions that restricted extensive partial melting in these rocks, leaving Na partitioned into the solid phase (gedrite).