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RELICT SAPPHIRINE IN PYROPIC GARNET FROM THE EASTERN SØR RONDANE MOUNTAINS, ANTARCTICA (ABSTRACT)

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Sapphirine-bearing biotitic schist forms a reaction zone between an ultramafic lens and its host biotite-hornblende gneiss at Balchenfjella, which is underlain by migmatitic complex metamorphosed under granulite-facies conditions in the Late Proterozoic and under amphibolite-facies conditions in the Early Paleozoic. This schist consists of porphyroblastic garnet, the core of which is compositionally homogeneous pyrope-almandine ($X_{Mg}=Mg/(Fe+Mg)\cong0.50$) surrounded by an almandine rim ($X_{Mg}\cong0.27$), biotite ($X_{Mg}=0.70$-0.73), plagioclase (An_{75-87}), spinel ($X_{Mg}=0.26$-0.36), corundum, rutile and zircon. In addition, individual garnet porphyroblasts enclose different mineral associations in the magnesian cores as follows: (A) sapphirine ($X_{Mg}=0.75$-0.85), commonly with kyanite, and, locally, with spinel ($X_{Mg}=0.50$-0.68), (B) kyanite only, and (C) gedrite ($X_{Mg}=0.75$-0.78)+quartz aggregates.

The mineral associations sapphirine+kyanite±spinel and gedrite+quartz±kyanite are inferred to be relict assemblages of the prograde *P-T* path, and the magnesian garnet cores to have been homogenized during the granulite-facies event. Differences in the associations are presumed to have resulted from pre-metamorphic chemical heterogeneity in the precursor to the biotitic schist. These mineral associations suggest a clockwise prograde *P-T* trajectory entirely within the kyanite field; the assemblage sapphirine+kyanite might have been stable as *T* approached 700°C constraining *P* to be at least 8 kbar.

Further increase in temperature was accompanied by a small decrease in *P* to the 7-8 kbar (at $T=760$-800°C) estimated for peak conditions in the granulite-facies by M. ASAMI *et al.* (Proc. NIPR Symp. Antarct. Geosci., **6**, 57, 1993). The relict sapphirine-kyanite assemblages in the Sør Rondane Mountains are similar to those reported from the Lüzow-Holm Bay complex, Antarctica, and the Highland Complex, Sri Lanka (*e.g.* Y. OGO *et al.*: Recent Progress in Antarctic Earth Science, ed. by Y. Yoshida *et al.* Tokyo, Terra Sci. Publ., 75, 1992), suggesting similarities in the *P-T* evolution of the three areas.

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