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LETTER

Further observations related to a possible occurrence of terrestrial ahrensite

WILLIAM E. GLASSLEY[1,2,*], JOHN A. KORSTGÅRD[2], AND KAI SØRENSEN[3]

[1]Department of Geology, University of California, Davis, California 95616, U.S.A.
[2]Department of Geoscience, Aarhus University, 8000 Århus C, Denmark
[3]Geological Survey of Denmark and Greenland (GEUS), DK-1350 Copenhagen, Denmark

ABSTRACT

Clusters of aligned, highly elongate, prismatic quartz (Qtz) rods occur in a few fayalite (Fa) crystals in an eulysite from a recently identified ~1.8 Gy UHP site in central West Greenland (Glassley et al. 2014). Additional detailed analyses of the crystallography and phase compositions of these olivines were conducted to evaluate the postulate that the Qtz rods formed during inversion of super-silicic ahrensite to Fa+Qtz during decompression. These new observations show the Qtz rods consistently occur in crystallographically coherent clusters with the Qtz grains aligned parallel to [100] of Fa. The contrasting compositions of coexisting primary UHP Fa and Fa postulated to have formed by inversion of ahrensite are consistent with the inversion scenario. We thus conclude that all available data are consistent with the postulate that ahrensite was part of the equilibrium phase assemblage formed during UHP metamorphism and that it inverted to Fa+Qtz upon decompression. If true, this would represent the first occurrence of terrestrial ahrensite formed through natural tectonic processes.

Keywords: Ahrensite, UHP, quartz exsolution, fayalite, Greenland