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Ferroanthophyllite in Rockport grunerite: A transmission electron microscopy study

KRASSIMIR N. BOZHILOV[1,*] AND BERNARD W. EVANS[2]

[1]Central Facility for Advanced Microscopy and Microanalysis, University of California, Riverside, California 92521, U.S.A.
[2]Department of Geological Sciences Box 351310, University of Washington, Seattle, Washington 98195-1310, U.S.A.

ABSTRACT

A transmission electron microscopy study reveals the microstructure of polysynthetically twinned, near end-member grunerite from Rockport, Massachusetts. A small percentage of *Pnma* ferroanthophyllite of similar composition is present as thin slabs intergrown parallel to (100) of grunerite and as individual μ-size crystals. HRTEM imaging shows that grunerite is free of chain-multiplicity faults. The observed microstructures are interpreted as a result of partial transformation of ferroanthophyllite to grunerite, a mechanism that is also supported by microstructures observed in the *Pnmn* protoferroanthophyllite from Cheyenne, Colorado, with similar composition. This study supports the possibility that grunerite, ferroanthophyllite, and protoferroanthophyllite may all possess true stability fields.