

*American Mineralogist, Volume 86, pages 773–779, 2001*

## **Calcite inclusions in forsterite**

**JOHN M. FERRY**

Department of Earth and Planetary Sciences, Johns Hopkins University, Baltimore, Maryland 21218, U.S.A.

### **ABSTRACT**

Forsterite in metamorphosed siliceous dolomites commonly contains calcite inclusions that are significantly more magnesian than even the most-magnesian calcite grains in the matrix of the same rock. Calcite inclusions in forsterite from dolomite-bearing rocks therefore have an unexploited potential for providing more-accurate estimates of the peak  $T$  of metamorphism than do matrix calcite grains. Some consequences for estimating fluid pressure and for the development of models of heat and fluid transport during contact metamorphism are reviewed. Measured compositions of calcite inclusions in forsterite from five contact aureoles indicate that significant growth of forsterite grains continues over a 50–200 °C range in  $T$  after the initial nucleation and growth of the mineral during heterogeneous mineral-fluid reaction. The continued growth may occur by an annealing mechanism driven by reduction in interfacial free energy.