

Clinopyroxene exsolution in wollastonite from Namaqualand granulite, South Africa

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ABSTRACT

Chemical and crystallographic properties of clinopyroxene exsolution in wollastonite are described from metamorphosed calc-silicate granulite, Namaqualand, South Africa. The wollastonite is $\text{Ca}_{1.96}\text{Fe}_{0.01}\text{Al}_{0.01}\text{Si}_{2.01}\text{O}_6$ belonging to space group $P2_1/a$ (2M polytype) and the clinopyroxene is $\text{Ca}_{0.99}\text{Mg}_{0.75-0.80}\text{Fe}_{0.17-0.21}\text{Na}_{0.02}\text{Al}_{0.03}\text{Si}_{1.99-2.00}\text{O}_6$ belonging to $C2/c$. An electron backscattered diffraction investigation suggests that the clinopyroxene lamellae elongated along $[\bar{1}\bar{1}1]$ lie on (120) and (100) of the wollastonite-2M, and $[1\bar{1}0]$ of both lamellae are parallel to $[001]$ of the wollastonite-2M. The formation of the exsolution probably results from the relatively high peak metamorphic temperature (800–860°C) of the Namaqualand granulite and its slow cooling rate.

Keywords: Wollastonite, exsolution, clinopyroxene, TEM, EBSD