

High temperature in-situ X-ray diffraction study of enstatite up to the melting point

Dayong Jiang[1], Kiyoshi Fujino[2], Naotaka Tomioka[1], Kaushik Das[1]

[1] Earth and Planetary Sci., Hokkaido Univ, [2] Divi. of Earth and Planetary Sci., Hokkaido Univ.

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There is much controversy regarding the occurrence and stability fields of enstatite MgSiO_3 polymorphs, particularly of high temperature clinoenstatite ($C2/c$, high-T CEn). High temperature X-ray powder diffractometry was employed to examine the phase relations of enstatite up to the melting point by using low clinoenstatite (CEn) as a starting material. The results showed that the CEn \rightarrow PEn(protoenstatite) transition was below 1100C and PEn was stable up to the melting point. Two extra peaks ($d=3.0785\text{\AA}$, 3.3287\AA , at 1200C) which could not be indexed by PEn accompanied with PEn but disappeared at 1450C, indicating the metastable appearance of high-T CEn.