

## Formation of metastable assemblages and the grain-size reduction in the postspinel transformation

# Tomoaki Kubo [1], Eiji Ohtani [2], Takumi Kato [3], Satoru Urakawa [4], Akio Suzuki [5], Kenichi Funakoshi [6], Wataru Utsumi [7], Takumi Kikegawa [8], Kiyoshi Fujino [9]

[1] Tohoku Univ, [2] Institute of Mineralogy, Petrology, and Economic Geology, Tohoku University, [3] Inst. Geoscience, Univ. Tsukuba, [4] Dept.of Earth Sci., Okayama Univ., [5] Faculty of Science, Tohoku Univ., [6] JASRI, [7] JAERI, [8] IMSS, KEK, [9] Earth and Planetary Sci., Hokkaido Univ.

In order to clarify mechanisms and kinetics of the postspinel transformation in  $\text{Mg}_2\text{SiO}_4$ , in situ X-ray diffraction experiments under high pressure and temperature were carried out using "SPEED-1500" and "MAX90" multi-anvil high pressure apparatus installed at SPring8 and KEK, respectively. Transformation experiments were conducted at 22.7-28.2 GPa and 1133-1473K. We confirmed that  $\text{Mg}_2\text{SiO}_4$  spinel metastably dissociated into  $\text{MgSiO}_3$  ilmenite and periclase, stishovite and periclase, which are considered to be the intermediate step in the transformation from spinel into  $\text{MgSiO}_3$  perovskite and periclase. The postspinel assemblages grow into spinel with lamellar textures. The lamellar spacing becomes less than 0.5 micron with the overpressure of more than 0.5 GPa.