Biotitization of vermiculite under hydrothermal condition

Mamoru Sato[1], Takeshi Kasama[1], Takashi Murakami[2]

[1] Dept. of Earth and Planetary Science, Univ. of Tokyo, [2] Deprt. of Earth Planet. Sci.., Univ. of Tokyo

To demonstrate biotitization of vermiculite experimentally, hydrothermal experiment was carried out reacting vermiculite with K- and Si- bearing solution in a Teflon vessel at 150oC for 14, 51, and 71 days. X-ray powder diffraction analysis revealed that biotite is formed within 71 days. More detailed study by high-resolution transmission microscopy showed that biotite domains of more than several nm in thickness are already formed within vermiculite for 14 days. Our results clearly indicate that biotitization of vermivulite can occur under hydrothermal condition. This suggests that vermiculite formed during weathering be progressively changed to biotite by diagenesis as well as metamorphism after burial.