

Development of novel characterization method for extraterrestrial clay mineral

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Clay minerals, a kind of hydrous minerals that may be included in meteorites, are generated in the presence of liquid water. There are a wide variety of clay mineral species depending on their mineral content and coordination positions. The mineral species of clay minerals are related to their formation environment (e.g., the cation compositions and/or the Eh-pH condition). Therefore, the characterization of clay mineral species can reveal the water environment of extraterrestrial material such as meteorite when they were formed. In this study, we focused on the “scanning transmission X-ray microscope (STXM)” as a new tool for analyzing meteorite samples containing clay mineral species. The purpose of this study is to collect X-ray absorption spectra of the major elements from various standard clay minerals on the earth for the construction of a database for the identification of clay minerals species in the actual meteorite samples such as Martian meteorite.

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