Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

MTT37-P05 Room:Convention Hall Time:May 21 17:15-18:30

In-situ infrared spectroscopic observations of sulfate surface

YANG, Chen[1*], KITADAI, Norio[2], FUKUSHI, Keisuke[3]

[1]Graduate School of Natural Science and Technology,Kanazawa University, [2]Graduate School of Science, Osaka University, [3]Graduate School of Science, Osaka UniversityInstitute of Nature & Environmental Technology, Kanazawa

<<In-situ infrared spectroscopic observations of sulfate surface complexation on ferrihydrite>>

Adsorption of solute to the surface of metal oxide is an important process that can control the mobility and solute concentration in natural water. Adsorption behavior of solute is related to the structure of solute on the surface (surface complex). The type of surface complex on a solute of a mineral surface depends not only is not the type of minerals and solutes but also the solution conditions such as pH, ionic strength and solute concentration. Therefore, the understanding of the adsorption behavior is necessary to understand the surface complex as function of the mineral types and solution compositions.

Sulfate is a major anion in nature and affects the mobility of coexisting trace dissolved species on mineral surfaces. Ferrihydrite is a low-crystalline iron oxide widely distributed in nature. Because of the huge specific surface area and the positively charged behavior, it is considered as an excellent scavenger for oxyanions. Although the adsorption of sulfate on ferrihydrite must be important process governing the motilities of trace dissolved species, there are very limitied knowledge about the adsorption behavior of sulfate on ferrihydrite including the structure of surface complex.

Attenuated total reflectance-infrared spectroscopy (ATR-IR) method enbles the direct observation of surface complex structure in aqueous system. The purpose of this experiment is to determine the structure of surface complex of sulfate on ferrihydrite from the in-situ observation by using ATR-FTIR under a wide range of environment conditions.

Keywords: surface complexation, In-situ infrared spectroscopic observations, ferrihydrite, sulfate, Adsorption, Attenuated total reflectance-infrared spectroscopy (ATR-IR)