

## Water adsorption to gypsum by infrared spectroscopy under controlled relative humidity

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For the formation of clouds in the atmosphere under normal relative humidity, aerosol particles are necessary to act as cloud condensation nuclei (CCN). Among various aerosol particles, calcium sulfate such as gypsum ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) is supposed to be formed in the atmosphere by reactions of Ca-bearing minerals and  $\text{SO}_x$  species.

In order to examine if gypsum can act as CCN, we have conducted adsorption experiments of water to gypsum particles under controlled relative humidity (RH%).

Infrared spectra of gypsum showed changes in OH stretching bands with increasing RH. In order to examine quantitatively these changes, the OH bands were fitted by 6 Gaussian OH components (Fig.1)

Among these OH components, 3300  $\text{cm}^{-1}$  component (Fig.1: 5) showed significant increases with increasing RH. This component is considered to be corresponding to water molecules with relatively short hydrogen bond distances, which are adsorbed to gypsum. The relation of this water adsorption to cloud formation and assignments of other OH components will be discussed. We will also try to extend the water adsorption experiments to gypsum to lower temperatures from room temperature.

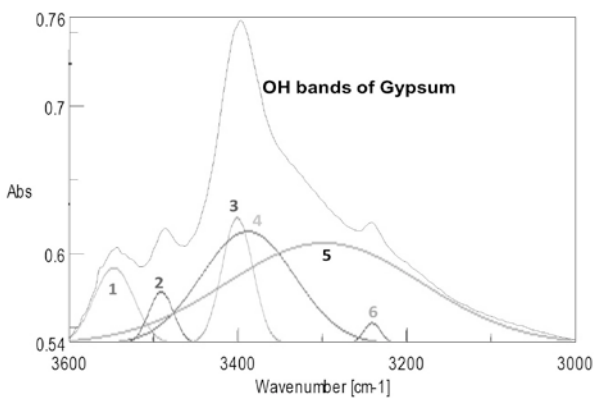


Fig.1. A representative curve fitting of OH bands of gypsum at relative humidity 40%.