INFRARED SPECTROSCOPY OF HYDRATED DOUBLY-CHARGED METAL IONS PRODUCED BY ELECTROSPRAY IONIZATION

HARUKI ISHIKAWA, TORU EGUCHI, AKIMASA FUJIHARA, YUJI YAMADA, KIYOKAZU FUKE, *Department of Chemistry, Graduate School of Science, Kobe University, Nada-ku, Kobe 657-8501, Japan*.

Until now, a large number of studies on the microscopic solvation effect of metal ion have been carried out. However, a very small number of spectroscopic studies on the doubly-charged metal ions are reported compared with that on the singly-charged ion. Since doubly-charged metal ions are highly energetic, electron- or proton- transfer reactions with solvent molecules should compete with the stabilization by solvation. Thus, we have carried out infrared spectroscopy of the hydrated doubly-charged metal ions.
In the present study, we used the electrospray ionization method to produce the hydrated doubly-charged metal ions. The ions mass-separated by the first quadrupole mass filter are irradiated by IR laser light and then fragment ions are detected by the second quadrupole mass analyzer. In the case of $Mg^{2+}(H_2O)_7$, a structure where one water molecule is hydrogen-bonded to the 6-coordinated Mg^{2+} is indicated by the IR spectrum. IR spectra of other systems will be presented in the paper.