

Report on “The 15th Asian Chemical Congress”

Kenji Sakota and Mitsuhiko Miyazaki

(Department of Chemistry, Kyushu University; Chemical Resources Laboratory,
Tokyo Institute of Technology)

The 15th Asian Chemical Congress (15ACC) was held at Resorts World Sentosa, Singapore, in August 19–23, 2013. This conference was aimed at enhancing current networks and establishing new collaborative links within Asian community. Topics discussed in 15ACC covered a broad range of chemistry. One of these important topics, a session focused on fast kinetics named “Recent Progresses in Fast Kinetics and Their Application” was opened at Aug. 22nd. We, K. Sakota and M. Miyazaki were invited to the session to introduce recent results concerning to solvent reorganization dynamics in gas phase clusters. This theme directly concerning to the research target of the core-to-core program “Photoionisation-induced switch in aromatic molecule-solvent recognition”, thus we participated in 15ACC with a support of the Japan Society for the Promotion of Science (JSPS).

K. Sakota talked about water fluctuation among several local minima realized by photoionization of neutral in hydrated clusters. He measured IR spectrum of a cluster cation, and found IR transitions that can be assigned to different hydration forms are observed simultaneously in the IR spectrum. This observation means that several isomeric forms coexist in the cationic

state even though a single isomer was selectively ionized by a REMPI process. By analyzing a saturation effect of the IR spectrum, he concluded the water molecule walk around the local minima continuously, and cannot be trapped in a potential well.

M. Miyazaki talked picosecond time resolved IR spectroscopy on acetanilide–water cluster cation. It has previously been reported photoionization of the C=O bound isomer in the neutral ground state isomerizes to the N-H bound isomer by IR spectroscopy. The time resolved IR spectra clearly show the hydrogen bonded OH stretching vibration disappears ~3 ps after the ionization and the very broad hydrogen bonded NH stretching vibration appears instead. This observation clearly proves water reorientation in the cationic state. An analysis of time evolutions of IR transitions clarifies the isomerization reaction takes ~5 ps via an intermediate structure that does not have any hydrogen bonding with acetanilide. About the presentation, MM asked the true structure of the intermediate and the reaction path. These questions are quite important and essential. Actually we are collaborating with Prof. R. Mitric to determine the reaction path as soon as possible.