



IBS Center for Molecular Spectroscopy and Dynamics

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# Seminar

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- **SPEAKER**

Prof. Jae Yoon Shin (Korea University)

- **TITLE**

Dynamics of carbon dioxide and room temperature ionic liquids in supported ionic liquid membranes

- **ABSTRACT**

The atmospheric concentration of the major anthropogenic greenhouse gas, carbon dioxide, has been increasing since the industrial revolution, resulting in the onset of global warming and climate change. To mitigate the high CO<sub>2</sub> concentration in the atmosphere and its negative effects on global society, there has been enormous efforts to develop efficient technologies that can be used in carbon capture and storage (CCS). Among many materials and technologies, room temperature ionic liquids (RTILs) and supported ionic liquid membranes (SILMs) are considered as promising candidates for CO<sub>2</sub> capture media due to their high CO<sub>2</sub> solubility and selectivity and low energy consumption. Fundamental understanding of how CO<sub>2</sub> and RTILs behave in these media is a prerequisite for the rational design of SILMs in real applications. In this talk, the rotational and structural dynamics of CO<sub>2</sub> and RTIL in SILMs measured with infrared polarization selective pump-probe (PSPP) and two-dimensional infrared (2D IR) spectroscopies will be presented in comparison to those in bulk RTIL. Despite the relatively large pore size of the SILM (~ 350 nm), the complete orientational randomization of CO<sub>2</sub> and structural fluctuations of the RTIL in the pores are significantly slower than in the bulk RTIL. This implies that the RTIL structural change induced by the membrane interface can propagate out more than a hundred nanometers and influence the dynamics. Also, the influence of water on these dynamics in SILMs will be discussed to provide an useful insight for real applications.

- **DATE AND VENUE**

October 28, 2020 (Wednesday, 5:00 - 6:00)  
Seminar Room B (119), KU R&D Center

- **INVITED BY**

Prof. Kyungwon Kwak

- **LANGUAGE**

Korean