Center for Molecular Spectroscopy and Dynamics, IBS-Korea University

IBS Center for Molecular Spectroscopy and Dynamics

COLLOQUIUM

- **SPEAKER**
  Junwoo Kim (IBS Center for Molecular Spectroscopy and Dynamics)

- **TITLE**
  Time-resolved spectroscopy for photo-induced chemical reactions in solution phase

- **ABSTRACT**
  Even though many chemical reactions used in industry or researches take place in solution (or liquid) phase, they are too complicated to be understood because of their random orientation. The development in time-resolved spectroscopy, molecular dynamics and statistics encouraged the studies on liquid phase. Especially, time-resolved spectroscopy can directly visualize the statistical quantity of solution phase. When an impulsive and intense optical pulse is irradiated on an equilibrated liquid or solution, the irradiated part is perturbed and equilibrated again. The equilibration process is monitored by another optical pulse. In linear-response limit, the equilibration process corresponds to the fluctuation dynamics of the system. Further, time-resolved spectroscopy is only one experimental technique to study the excited-state dynamics of photo-induced chemical reaction system, where the population of the excited state is extremely small at room temperature. Various applications with photo-induced chemical reaction such as molecular probe, artificial photosynthesis and photovoltaics, requires solution phase. Therefore, it is important to understand the correlation between photo-induced chemical reaction and liquid dynamics.

  I present three types of researches; solvation dynamics, ultrafast photo-induced chemical reactions and applications. In solvation part, a slow solvation dynamics, which is firstly observed, is introduced. An ultrafast proton transfer and the intersystem crossing of transition metal complex are in the second part. The nonadiabatic and adiabatic natures of them are well represented, respectively. Finally, the excited-state dynamics of Thioflavin T, which is a molecular probe for amyloid fibrillation, is introduced in the last part. The excited-state dynamics of the probe with high time resolution suggests additional usage of Thioflavin T.

- **DATE AND VENUE**
  September 06, 2017 (Wednesday, 5:00 - 6:00 pm)
  Seminar Room 116, KU R&D Center

- **LANGUAGE**
  English