



IBS Center for Molecular Spectroscopy and Dynamics

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## Seminar

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- **SPEAKER**

Dr. Gi Rim Han (IBS CMSD)

- **TITLE**

The investigation of charge carrier dynamics by the transient absorption spectroscopy

- **ABSTRACT**

The absorption difference between the ground state and the excited state species, called transient absorption, is the most basic and fundamental technique of ultrafast time-resolved spectroscopy. Here I introduce the investigation of various charge carrier related excited state dynamics, conducted by the steady-state and the time-resolved spectroscopy along with some quantum calculation, with emphasis on the analysis of femtosecond transient absorption spectra. The target samples range from simple organic molecules to more complicated semiconductor materials. For the former, the excited state proton transfer of the common yellow dye quinophthalone and the novel biocompatible dye resveratrone is introduced. Also the triplet transients of iridium(III)-based OLED emitter complexes are acquired, and the relation between the intersystem crossing rate and their ligand orientation is explained via the symmetry breaking charge transfer. Such primary photophysical processes lay the base of physical photochemistry and are crucial for understanding the more complex systems, namely condensed multibody system, which can be analyzed using widely applied exciton-based models with analogous charge carriers, quasi-electron and hole. A typical example would be the observation of the energy and the electron transfer process in donor-acceptor type dye, where the role of methoxy functional group in fluorescence quenching is examined. The photoinduced current generation of polymerized donor-acceptor structure that undergoes self-assembly in aqueous solvent is handled as well. Then exciton dynamics of perovskites, organic-inorganic hybrid materials which are emerging as new promising materials for solar power generation, is presented and compared with the device characterization.

- **DATE AND VENUE**

August 11, 2021 (Wednesday, 13:00 - 14:00)

Virtual Seminar (Join Zoom Meeting)

<https://us06web.zoom.us/j/89730499062?pwd=aXNxbEUxOE1kc2BOOHRNRmtLdXR5Zz09>

Meeting ID: 897 3049 9062

Passcode: 400918

- **LANGUAGE**

Korean