

IRTG-Seminar



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“High-Pressure Effects on Photochemical Reactivity of Organic Molecular Materials Probed by Vibrational Spectroscopy”

Chemical transformations of molecular materials induced by high-pressure and light radiation exhibit novel and intriguing aspects that have attracted much attention in recent years. Particularly, under the two stimuli, entire transformations of molecular species can be realized in condensed phases without employing additional chemical constraints, e.g., the need of solvents, catalysts or radical initiators. These aspects make this synthetic approach in chemistry therefore satisfies increasing need for production methods with reduced environmental impact. However, as of now we have little knowledge about this method and lack comprehensive understanding of the combined pressure-photon effects on materials.

In this talk, I will present systematic high-pressure photochemical studies on selective molecular hydrocarbon materials. Specifically, we employ high-pressure to create the necessary reaction conditions to transform molecular materials, and further apply monochromatic light to trigger and direct the chemical reaction according to selective paths. Using optical microscopy, vibrational spectroscopy, and diamond anvil cell techniques, we have explored pressure effects on three prominent types of reactions, e.g., photodissociation, photoisomerization, photopolymerization reactions. The works provide insightful understanding of different effects that are achieved by the combined pressure-light tuning and demonstrate significant feasibility and controllability of the method in material synthesis.

**Tuesday, September 11, 2018; 1:00 p.m., HSII
Physics high rise, Hermann-Herder-Str. 3**

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