Presentation Title:

Photophysical properties of conjugated polymers studied by ultrafast optical spectroscopy

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Abstract :

Understanding the dynamics and the fate of excited states in conjugated materials is of utmost importance to improve their optoelectronic properties. The phenomena occurring in conjugated materials range from ultrafast processes such as excited state relaxation and charge transfer processes to much slower excited state and charge recombination processes, of which many are non-luminescent, i.e. their dynamics cannot be followed by classical time-resolved photoluminescence spectroscopy. Hence, spectroscopic techniques are required that allow one to follow the emission and absorption of excited states from femto- to milliseconds or even beyond. This talk will provide an overview of the different experimental techniques combined with recent experimental results on ultrafast energy and charge transfer processes. In particular, the photophysical properties and the occurrence of amplified spontaneous emission (ASE) in a series of stepladder-type polymers will be discussed. Secondly, ultrafast charge transfer processes studied by transient absorption spectroscopy in a random donor-acceptor type copolymer and in blends for photovoltaic applications will be presented. Finally, recent research activities and future research interests will be discussed.

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