

Gemeinsames Kolloquium der Sonderforschungsbereiche 445, 491 und 616

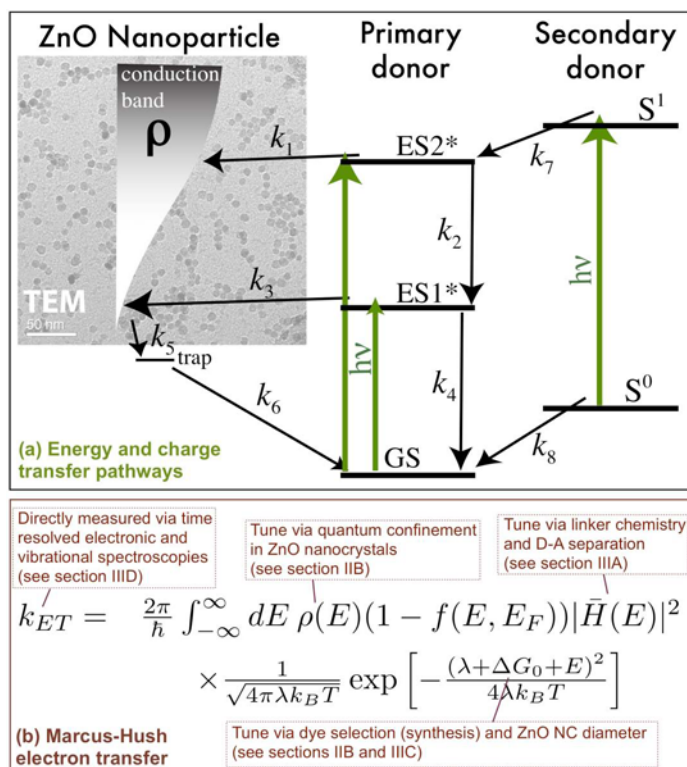
Vortragender: **Prof. Dr. Wayne L. Gladfelter**

CSE Distinguished Professor of Chemistry and Associate Dean of Academic Affairs
Department of Chemistry, University of Minnesota, Minneapolis, USA

Gast von Prof. Winterer

Thema: "Early Events in Nanoparticle-based Solar Cells: Excited State Charge Transfer from Organic and Dyes to ZnO Nanoparticles"

Abstract: We study the fundamental energy and charge transfer dynamics that govern light absorption and charge separation in zinc oxide-based dye-sensitized solar cells (DSSCs) as outlined section (a) of the figure. The overarching goal of this research is to study the relationship between structure, energetics, and dynamics in a set of synthetically controlled donor-acceptor dyads and triads. This presentation will outline studies of dispersible sensitizer/ZnO nanocrystal (NC) ensembles. Monodispersed ZnO NCs in the quantum-confined regime (< 6 nm in diameter), prepared by published methods, are used as a dispersible platform to which a variety of new sensitizers are attached for study using ultrafast spectroscopic techniques. Dye binding to the ZnO NCs is measured using static fluorescence measurements. Ultrafast spectroscopy is used to evaluate charge transfer rates from the dye excited state to the ZnO NC. The effect of NC size and the energy of the excited state of the dye will be described and is best understood using Marcus-Hush theory (section b of the figure).



Related publications:

"Photo-initiated Electron Transfer Dynamics of a Terthiophene Carboxylate on Monodispersed Zinc Oxide Nanocrystals", J. Phys. Chem. C, 2011, 115, 2-10.

"Binding and Static Quenching Behavior of a Terthiophene Carboxylate on Monodispersed Zinc Oxide Nanocrystals", J. Phys. Chem. C, 2011, 115, 11-17.

"Tuning Electron Transfer Rates via Systematic Shifts in the Acceptor State Density Using Size Selected ZnO Colloids", J. Am. Chem. Soc., 2010, 132, 13963-13965.

Zeit: Donnerstag, 12. Mai 2011, 15:00 Uhr

Ort: Gebäude MD, Raum 245 (Sondertermin) (Campus Duisburg)
Lotharstraße, 47057 Duisburg

Prof. Dr. A. Lorke
(Sprecher SFB 445)

Prof. Dr. Dr. h. c. H. Zabel
(Sprecher SFB 491)

Prof. Dr. M. Horn-von Hoegen
(Sprecher SFB 616)