SCA Synthetic Carbon Allotropes SFB953

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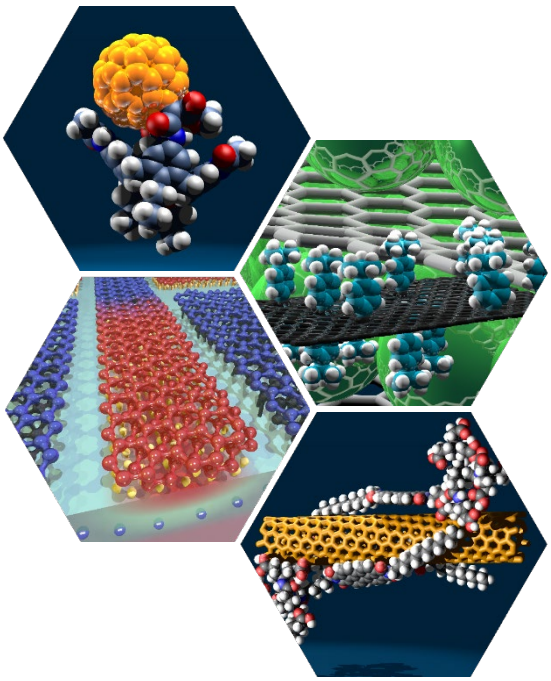

Doping at the Limit: Improving Charge Transport in Organic Light-Emitting Diodes Using Molecular Dopants

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Incorporating molecular dopants in organic hole and electron transport layers (HTLs and ETLs) has been crucial for the development of high efficiency organic light-emitting diodes (OLEDs). These layers facilitate the transport of either an electron or a hole as it is injected into the active emissive layer of a device. Organic semiconductors often have low conductivities and poor charge transport, particularly the large bandgap molecules utilized for green and blue LEDs. The charge transport layers which are used with blue and green OLEDs have two correlated challenges: their large transport gaps make them both insulating and difficult to p- or n-dope.

In this talk, I will discuss my efforts to address these issues by incorporating highly reducing n-dopants and oxidizing p-dopants into materials with a challenging IE and EA. I will cover the characterization of n- and p-doped charge transport layers characterized using ultraviolet and inverse photoemission spectroscopy (UPS and IPES) to characterize the band structure and determine the Fermi level shift in these doped films, lateral conductivity measurements, and contact potential difference measurements. In order to demonstrate the enhancement in charge injection using these doped transport layers, proof of concept OLEDs were fabricated.

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2:15 pm

Zoom-Meeting

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