N-Heterocyclic Carbenes (NHCs): Conductive and Stable Anchors for Au-based Hybrid Materials and Devices

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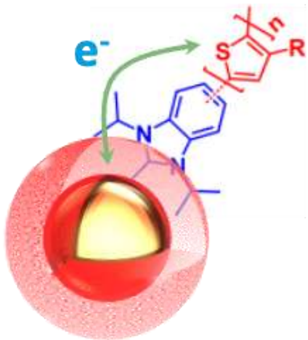

Left: *N*-heterocyclic carbenes (NHCs) facilitating electronic delocalization across the metal-polymer interface and true inorganic-organic hybrid nanostructures with high promise for electronic and optoelectronic applications

Coupled inorganic-organic nanostructures offer breakthroughs for a range of applications ranging from fields as diverse as photovoltaics, spin memories or optical upconverters to sensing or catalytic applications.[1] Nanoparticles exhibit unique properties that are not accessible at the macroscale, such as the quantum size effect for semiconducting particles and localized surface plasmon resonance in the case of noble metal nanoparticles. Elevating them to hybrid particle-based materials combines the merits of the inorganic (nanoparticle) with the merits of organic (molecules or polymers). However, this requires facilitating an electronic delocalization across the metal-organic interface. The seminar discusses *N*-heterocyclic carbenes (NHCs) as a high-performing alternative to traditional sulfur-based approaches to modulate the metal-organic interface. [2] NHCs exhibit excellent stability (e.g. regarding temperature, pH, and electrochemical redox), and are highly conductive, allowing to access true inorganic-organic hybrid nanostructures with high promise for electronic and optoelectronic applications.[3]

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