

Internal Webinar

π -Conjugated Donor-Acceptor Functional Materials: Asymmetric 2, 2'-Bipyridine Systems

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Bipyridyl-based π -conjugated chromophores have gained widespread attention due to their potential applications in organic light-emitting diodes (OLEDs), nonlinear optics (NLOs), electrogenerated chemiluminescence (ECL) and dye-sensitized solar cells (DSSCs). So far, plenty of symmetric bipyridine chromophores have been reported but very few are symmetrically substituted bipyridine chromophores. This is due to the difficulties in their synthetic protocols. In my presentation, I will mainly focus on the synthetic aspects of asymmetric substituted 2,2'-bipyridine based donor-acceptor chromophores and their potential applications in fluorescence properties, nonlinear optics (NLO). By introducing different donor substituents on 2,2'-bipyridine based donor-acceptor chromophores, we are able to tune the emission from green to near-infrared (NIR) in presence of transition metal ions through intramolecular charge-transfer (ICT). Further, these asymmetric bipyridine chromophore ligands can be employed to make half sandwich-type metal complexes with Ruthenium ions with NIR emission and explore their applications as photo sensitizers in photodynamic therapy, fluorescence probes for imaging and detection of biomolecules in cellular compartments.

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