Photoinduced Electron-Transfer Through the Mechanical Bond in a Supramolecular Dyad

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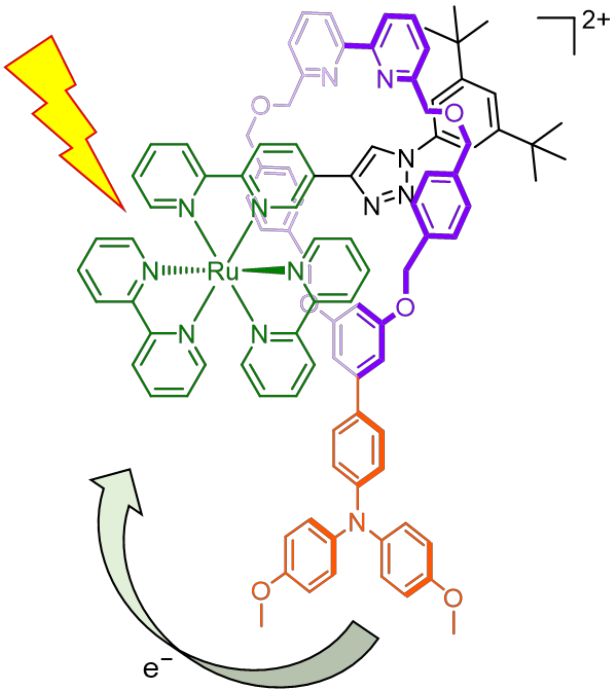
Photoinduced Electron transfer (PET) has been widely explored in covalently connected molecular motifs, mostly focusing on how various bridging motifs facilitate PET.[1] Although research has predominantly focused on PET through covalent bridges, an emerging field is through-space PET.[2] Within this framework, mechanically-interlocked molecules such as catenanes and rotaxanes represent a particularly interesting scaffold for PET, due to their unique three-dimensional topology and dynamic nature.[3]

Despite interest in PET in rotaxanes dating back to Sauvage's original work in the field,[4] fundamental insight into PET in mechanically-interlocked systems remains underdeveloped. To address this, herein is presented a systematic spectroscopic investigation on PET through the mechanical bond, using a supramolecular dyad comprised of a $[Ru(bpy)_3]^{2+}$ photosensitizer and a triarylamine (TAA) donor, situated on different components of a [2]rotaxane.



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