
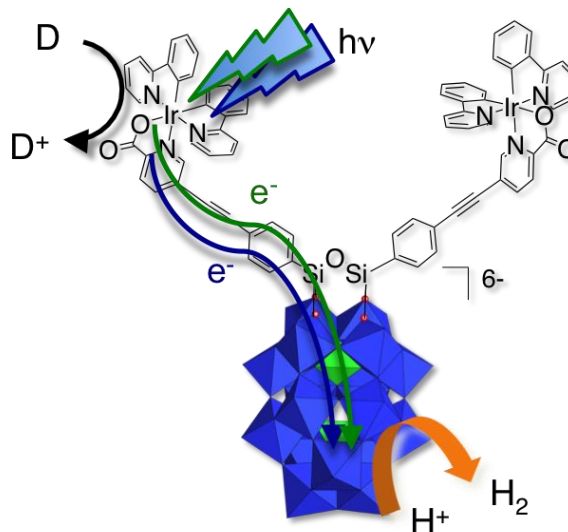


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Research keywords:

Organic-inorganic hybrids based on polyoxometalates, artificial photosynthesis, molecular electronics & photonics, inorganic supramolecular chemistry

My research interests are focused on the design of tailor-made polyoxometalate hybrids for different scopes of application, including artificial photosynthesis.¹⁻² I am indeed running a long-term project aiming at elaborating photoactive POM-based hybrids able to perform photocumulative electron transfer.³⁻⁴ Among the hybrids developed, POM-cyclometalated Ir hybrids displayed remarkable photophysical properties.⁵⁻⁶ The lifetimes of the charge-separated states (ranging from ns to hundreds of ns at room temperature) are the longest reported for covalently bonded photosensitized POMs. Charge photo accumulation and hydrogen photo production was also achieved under steady state photolysis conditions, which makes it a unique system reproducing the different steps of the photosystem (light absorption, charge separation, charge accumulation and multi-electron catalysis).



More recently, I developed a POM-bodipy system.⁷ The interest of these compounds lies in the absence of noble metals at in the photoactive antenna as well as in the possibility of subsequently grafting ancillary groups on the organic chromophore in order to develop molecular photocathodes. The photophysical properties of a POM-bodipy compound (studied in collaboration with the group of Dr. Elizabeth Gibson at Newcastle University) showed very rapid electronic injection of bodipy to POM (of the order of 50ps) in agreement with those desired for the development of molecular

photocathodes. I also expanded my research interest to POM-based supramolecular assemblies⁸⁻⁹ and shifted my research topics from covalent functionalization of discrete POMs towards their nanostructuration and integration into functional molecular functional devices.

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