



Inorganic Chemistry Seminar Series

Tuesday, April 17, 2018, 12:30 pm
Seaver Science Library, Room 150

SSC Auditorium next to the library

Professor Claudia Turro

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The Ohio State University

Excited States of Transition Metal Complexes: From Fundamental Science Toward Photochemotherapy

Excited state processes of transition metal complexes initiated by the absorption of light have potential applications in various fields, such as photochemotherapy (PCT) and solar energy conversion. These reactions include photoinduced ligand exchange, charge transfer, photoisomerization, and energy transfer to produce $^1\text{O}_2$. In the case of Ru(II) and Rh₂(II,II) complexes, the relative energies of the metal-to-ligand charge transfer (MLCT), ligand-field (LF, metal-centered), and ligand-centered (LC) excited states play a key role in the observed reactivity.

The use of light to activate the action of a drug has become an important mode of cancer therapy, in some cases superior to traditional treatments, due to its low levels of invasiveness and systemic toxicity. Photoinduced ligand exchange, which can be used to release caged drugs or to induce covalent DNA binding with spatiotemporal control, together with the sensitization of $^1\text{O}_2$, represent important reactions initiated by light with potential applications in photochemotherapy (PCT). These photoinduced reactions of Ru(II) complexes will be presented, along with their activity towards biological targets and cancer cells. Importantly, Ru(II) complexes were recently discovered to undergo multiple photochemical pathways following activation with light, and this property was used to design new dual-action compounds. These new complexes are able to both release a medically relevant compound and to produce $^1\text{O}_2$ and were shown to exhibit significant enhancement of activity stemming from their ability to induce cell death via two different, independent pathways. These new complexes provide a new platform for drug delivery and enhanced therapeutic activity upon excitation with low energy light.

Hosted by Professor Mark Thompson

The scientific community is invited

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