Tuesday, February 26, 2019, 12:30 pm
Seaver Science Library, Room 150
SSC Auditorium next to the library

Professor Dave Herbert

Department of Chemistry
University of Manitoba

Benzannulated Aromatic N-Heterocycles and their Coordination Complexes

Pyridines appear prominently in a number of well-known "non-innocent" ligand systems, participating both 'directly' and 'indirectly' in the redox and chemical reactivity of metal complexes. ‘Benzannulation’ can be used to extend the conjugated system of pyridine to quinoline (2,3-benzopyridine) to acridine (2,3-benzoquinoline), stabilizing the lowest unoccupied molecular orbital (LUMO) of the molecule while raising the energy of the highest occupied molecular orbital (HOMO). In the context of coordination complexes, this should introduce more energetically accessible, vacant orbitals and stronger metal-ligand bonding, and therefore enable more facile chemical and redox non-innocence.

To test this hypothesis we developed synthetic routes to *phenanthridine* derivatives amenable for inclusion in multidentate ligands. Phenanthridine (3,4-benzoquinoline) is an asymmetric isomer of acridine (2,3-benzoquinoline) with an electronically accessible extended π-system and a chemically accessible, imine-like C=N double bond. These features have led to its application as the core of fluorescent DNA intercalators (ethidium bromide), in advanced chemotherapeutics (‘phenanthriplatin’), and as a biomimetic hydride-shuttling co-catalyst in hydrogenation reactions. In this presentation, the impact of the *site* of π-extension on the materials properties and chemical reactivity[] of benzannulated *N*-heterocycles and their coordination complexes will be discussed, including the preparation of iron complexes with unprecedented nanosecond charge-transfer excited state lifetimes.

Hosted by Professor Smaranda Marinescu

The scientific community is invited

USC Department of Chemistry
chem.usc.edu