UNIVERSITY OF HOUSTON
CULLEN COLLEGE OF ENGINEERING

Center for Integrated Bio and Nano Systems
SPEAKER SERIES

PRESENTS

Synthetic Strategies to Optimize Photophysical and Photoredox Properties of Organometallic Complexes

Dr. Tom Teets
Chemistry, University of Houston

Friday, February 23, 11:15 am
Classroom and Business Building, Room 122

LECTURE ABSTRACT

This talk describes complementary synthetic strategies to enhance the luminescence and photoredox properties of organometallic complexes. Most of the lecture describes bis-cyclometalated iridium complexes, a class of compounds well-known for their efficient triplet-state luminescence and excited-state redox chemistry. The first part describes advances in the synthetic chemistry of cyclometalated iridium, overcoming the substitutional inertness of iridium(III). Postsynthetic modification strategies, using the inherent reactivity of coordinated ligands, give rise to new structure types and have led to the discovery of efficient thin-film phosphors. In the second part of this talk, targeted efforts for designing efficient red and near-infrared phosphors and potent photoreductants are outlined, all of which involve preparing bis-cyclometalated iridium complexes with nitrogen-containing, π-donating ancillary ligands. This approach has led to the discovery of compounds with up to fourfold enhancements in the quantum yield for red phosphorescence, produced a class of compounds with tunable near-infrared phosphorescence, and yielded a set of potent photoreductants which outperform state-of-the-art photosensitizers in photoinduced electron-transfer reactions.

SPEAKER BIOSKETCH

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