



GESELLSCHAFT
DEUTSCHER CHEMIKER

KOLLOQUIUM

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Titel

Tailoring the electronic structure of manganese(II) complexes for light activation

Vortragender

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Abstract

The development of photoactive transition metal complexes is central to advancing solar energy conversion, photocatalysis, and light-driven molecular technologies. To date, many of the most effective photosensitizers rely on scarce and expensive precious metals such as ruthenium(II) and iridium(III), motivating the search for sustainable alternatives based on earth-abundant elements. In this context, complexes based on manganese have emerged as attractive candidates owing to manganese's low cost, high natural abundance, and reduced environmental impact. However, achieving favorable excited-state properties remains a significant challenge, requiring rational ligand design strategies.

In this talk, I will present our group's efforts to advance the photophysical properties of manganese(II) complexes. We have developed two different platforms based on 1) *N*-heterocyclic carbenes (NHCs) and 2) formazanate ligands. Through a combination of advanced laser spectroscopy and theoretical calculations, we establish the underlying excited-state landscapes and identify the key factors governing their dynamics. Interestingly, we find that the excited state landscapes of the manganese(II) complexes based on NHC and formazanate ligands are dominated by opposite charge transfer direction, i.e., metal-to-ligand charge transfer (MLCT) and ligand-to-metal charge transfer (LMCT), respectively. Such an outcome also highlights that developing photoactive complexes based on Earth-abundant metals is not simply about mimicking the photophysics of established ruthenium(II) and iridium(III) complexes. Instead, the weaker ligand-field splitting of first-row transition metals gives access to distinct excited-state landscapes that can enable new photophysical behavior and photochemical applications.

Ort

Chemie, HS2 – Campus Nord, Otto-Hahn-Straße 6

Anfahrt: <http://www.ewit.ccb.tu-dortmund.de/gdch/anfahrt.html>

Zeit

Mittwoch, 07.10.2026, Vortrag 17:00 ct

gez. Professor Dr. Andreas Steffen

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