

Unusual Structures and (Photo)-Chemical Reactivity of Organometallic Complexes of the f-Elements

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Organometallic complexes of f-elements are an interesting class of organometallic compounds developed in the 1950s and now concern most rare earth ions in their trivalent and divalent states as well as many actinides. The applications for such compounds are numerous for single electron transfer reactivity and small molecule activation.¹ Because of their optical and magnetic properties, their Single-Molecule-Magnet behavior has impressed with record blocking temperatures.² Additionally, very original magnetic behaviors have shed light on their intriguing bonding nature.³ We will briefly overview our methodology for synthesizing organometallic complexes with original geometries,⁴ in which the oxidation state is not trivial to assess because of intermediate valent electronic states.⁵ Among many large aromatic ligands, the cyclononatetraenyl (Cnt) anion, a nine-membered ring, showed interesting photochemical isomerization and switching properties.⁶ Our tribulations will be presented during this seminar.

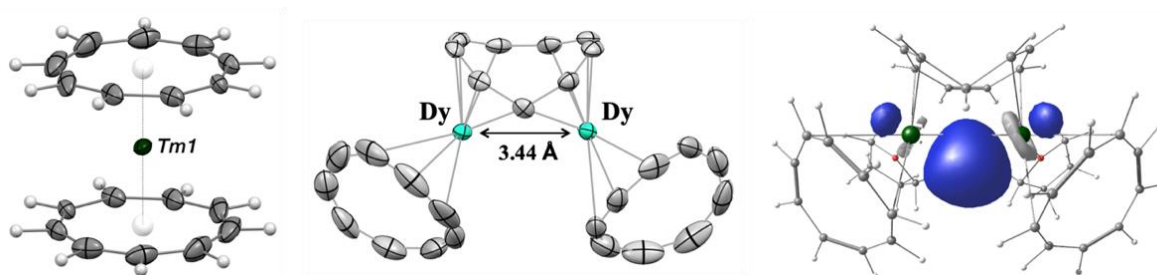


Figure. Linear thulium complex with the cyclononatetraenyl ligand⁵ (left), dysprosium complex (two THF molecules have been removed for clarity) with a possible metal-metal interaction (ORTEP, center, and HOMO, right).

References

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