

Undergraduates, Crystals, & Crystallography

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At UT, Austin undergraduates are working in a research lab learning the art of growing crystals, collecting data on Rigaku, Bruker, and Agilent diffractometers, and using Olex2 to solve and refine their crystal structures. This research is integrated into course credit options for the students to obtain valuable research experience during their first couple of semesters. Students have opportunities to stay in the lab to finish projects, learn more advanced techniques, and teach the incoming students about our research. Our research projects focus on lanthanide complexation chemistry which has become an explosive field within recent years due to new advances in lasers, optics, and radiology. Unique lanthanide-containing compounds have strong photophysical characteristics which are dependent upon the ligand environment. The ligands used in this group are called Schiff base ligands which coordinate well to lanthanides. They also have the appropriate band gap to transfer energy via the antennae effect. The lanthanide coordination complexes exhibit sharp and distinct emission bands in the visible and infrared regions of the electromagnetic spectrum with long-lasting luminescence lifetimes. Single crystal X-ray crystallography is the best way to characterize our lanthanide coordination complexes.

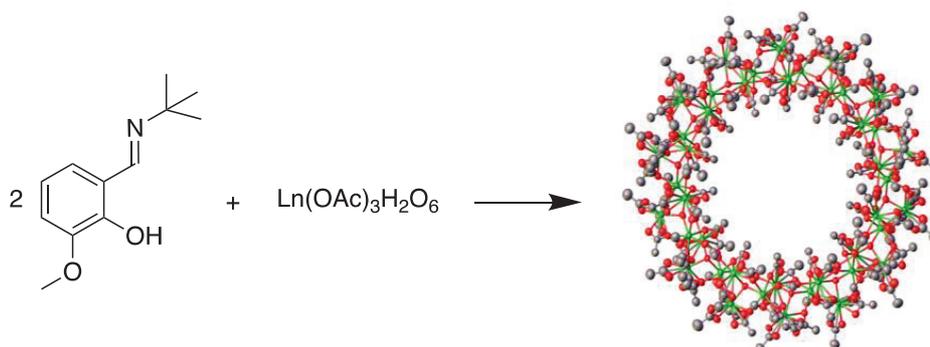


Figure 1. Formation of a molecular wheel containing 42 lanthanide atoms from the reaction of a simple Schiff base ligand with a lanthanide acetate hydrate.