

Title: "Atomic Layer Deposition for Undergraduate Laboratory Curriculum"

Proposal:

Atomic layer deposition (ALD) has become increasingly important in the microelectronic industry for thin film manufacturing. A major challenge with ALD is the synthesis of viable precursors. Introduction to ALD in an undergraduate laboratory setting would ideally focus on the challenge of precursor development while providing the students with an opportunity to synthesize an air-stable precursor that could be handled easily in the laboratory. Furthermore, ALD in undergraduate laboratories is not commonly taught because of the need for specialized equipment. However, the introduction of this subject in undergraduate curriculum would expose students to a field of industry that is continually growing. This study presents work towards the development of a set of experiments that will be modified for use in either a general chemistry or an inorganic chemistry laboratory. Tris(pyrazolyl)borate metal complexes that have been reported as air-stable ALD precursors will be synthesized and characterized for comparison with literature reported values and the inorganic or general chemistry principles related to these complexes will be discussed.