

Internal Webinar

Taming the Reactivity in Aluminum and Bismuth Cations through Intramolecular Coordination

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Lewis acidic compounds play an important role in the activation of inert bonds.^[1] Various ligand systems can be employed to tune the Lewis acidity of such compounds. Intramolecular coordination using chelating ligand systems has drawn attention of synthetic chemists for stabilizing cationic main group element centers.^[2] This ligand chelate effect is expected to show direct consequence on the reactivity of the Lewis acids.^[3-6] In this presentation, synthesis of cationic organo aluminum and bismuth complexes bearing 2-(dimethylamino)phenyl (2-Me₂NC₆H₄) and 2-(dimethylaminomethyl)phenyl (2-Me₂NCH₂C₆H₄) systems will be discussed. Lewis acidity of the aluminum and bismuth compounds has been experimentally quantified by Gutmann-Beckett method. As a general observation, the four-membered chelate complexes are observed to be more Lewis acidic than the five-membered chelate complexes. The higher reactivity of the four-membered chelates is demonstrated by performing a variety of Lewis acid catalyzed reactions including aldehyde dimerization, de-oxygenation of ketones, hydrosilylation of aldehydes and ketones.^[4-6]

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