

Abstract Submitted
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Oxidation and Unimolecular Decomposition of Aluminum Metalloids Nanoclusters SUFIAN ALNEMRAT, The Hashemite University, JOSEPH HOOPER, Naval Postgraduate School — We have been studying molecular scale aluminum clusters (known as metalloids clusters) that are passivated against immediate oxidation via a layer of organic ligands as energetic materials that may retain the high energy density of bulk metals but offer substantially faster reaction kinetics. Several experimental efforts have also begun on lab-scale synthesis of ligated metalloids clusters that could be tailored for energetics applications and allowing low-valence metals to oxidize within the reaction zone of a detonation. But, considerable synthesis challenges remain. The air stability provided by these ligands is currently one of the key limiting factors in moving to larger scale testing of these materials. Recently, we showed that nucleation and growth of well-dispersed aluminum nanoclusters supported by functionalized-graphene layers is possible and may provide new insights toward more stable nanostructures.

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