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**Regeneration of Aluminum Hydride studied with Raman Microscopy.** DAVID LACINA, JASON GRAETZ, J.J. REILLY, Brookhaven National Laboratory — We are interested in developing new methods to form aluminum hydride directly from aluminum powder and hydrogen. Due to the low free energy of formation, aluminum and hydrogen require extremely high pressures to react and form the hydride. It is possible to form alane directly at low pressure when it is catalyzed with a small amount of titanium (2 mol %) and stabilized as an adduct. We have studied the formation of amine-alanes by direct hydrogenation of aluminum and have attempted to understand the mechanisms behind these reversible reactions and the role of the catalyst. We will present the results from our recent survey of possible reactions between aluminum, hydrogen and various amines. We will also present the results of a Raman spectroscopy study of the alane polymorphs at ambient and high pressure and alane amines.

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