Complex Hydrides as Hydrogen Storage Media - M. Hampton and D. Slattery (University of Central Florida)

The use of hydrogen as a fuel involves a number of large technical challenges, not the least of which is storage. The complex hydrides of aluminum, the alanates, are currently of great interest for this application because of their large hydrogen capacities and their newly realized ability to recycle. In particular, sodium aluminum hydride is the subject of intense investigation because of recent work showing that incorporation of titanium and/or zirconium allows for reversible hydrogen release.

While sodium aluminum hydride contains a large amount of hydrogen, 7.5% by weight, only 5.4% is reversible. As a result, in this laboratory we are investigating other alanates, with larger hydrogen contents, for hydrogen storage. The hydrogen contents and hydrogen release properties of other alanates will be discussed. The effects of catalysts, including titanium and zirconium, on the hydrogen capacities and hydrogen release characteristics of these alanates will be discussed along with the effects on the reversibility of the hydrogen release of the catalyzed compounds.