Hydrogen Storage in Metal Hydrides <u>K.J. Gross</u>

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Hydrogen storage for transportation is becoming an increasingly important area of research. Metal hydrides have offer a unique and practical way to reversibly store hydrogen. However, until recently, properties such as the gravimetric hydrogen storage capacity or desorption temperatures as well as cost have precluded hydrides for on-board hydrogen storage. This changed with the discovery that hydrogen can be reversibly absorbed and desorbed from titanium-doped complex hydrides (e.g. NaAlH₄) under practical conditions. The "Alanates" can reversibly store greater than 4 wt.% H₂. A breakthrough for these materials has been the development of solvent-free direct synthesis methods combined with solid Ti-doping. This has lead to dramatic improvements in the reversible hydrogen capacity, sorption kinetics, cycle-life, and purity of the desorbed hydrogen. The latest results in developing these materials will be presented.

Keywords: Metal hydride; Complex hydride; Catalysis; NaAlH₄; Na₃AlH₆; Hydrogen storage; Fuel cell;

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