

## Ammonia-Borane( $\text{NH}_3\text{BH}_3$ ) for chemical hydrogen storage

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Ammonia-Borane( $\text{NH}_3\text{BH}_3$ ) with high hydrogen content of 19.5wt% was investigated as a candidate for chemical hydrogen storage material. Synthesis of  $\text{NH}_3\text{BH}_3$  and hydrogen release at elevated temperature were carried out. Molecular structure of commercial  $\text{NH}_3\text{BH}_3$  and synthesized  $\text{NH}_3\text{BH}_3$  was compared by XRD and  $\text{B}^{11}$  NMR analysis. The effect of elevated temperature such as melting and hydrogen release was studied by TGA, DSC, and Mass Spectroscopy of decomposed gases. Hydrogen release around 100°C was observed and the effect of heating rate was also investigated. Basic properties of  $\text{NH}_3\text{BH}_3$  as a hydrogen storage material were analyzed and operating condition was suggested for the use of novel hydrogen storage system component.