

Abstract Submitted  
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**Phase Transition Study of Ammonia Borane/Polymer Composites: Potential Hydrogen Storage Systems**<sup>1</sup> OZGE GUNAYDIN-SEN, RAMESH SUVVARI, Lamar University — Ammonia Borane ( $\text{NH}_3\text{BH}_3$ ), a potential hydrogen storage material exhibits a phase transition at  $T_p \sim 223$  K but the underlying mechanism is unclear. Ammonia borane (AB) blended with polymers (e.g. polyacrylamide) significantly improves the dehydrogenation kinetics and suppression of byproducts/impurities. We carried out heat capacity measurements over a temperature range of 180–300 K, and detected an anomaly at around 223 K, indicating a first-order transition. The change in enthalpy and entropy was calculated for AB as well as the composites and compared. The transition enthalpy and entropy revealed a decrease by increasing the polymer content and the transition temperature showed a small shift to lower temperatures for AB/Polymer composites both of which could be due to the interaction between polyacrylamide and AB after blending. This phenomena was also supported by infrared measurements.

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