Preparation of Amine Boranes, Ammonia Borane, and Phosphine Boranes

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- Chemistry and Chemical Analysis

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- Amine-Boranes
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- Hydrogen Storage

Amine and phosphine-boranes, the classic Lewis base-Lewis acid (LB-LA) pairs have been known and valued for over a century, with uses that include hydrogen storage applications. There are major drawbacks associated with current procedures for making amine-boranes, including low efficiency and other issues such as formation of highly unpleasant odors from the necessary reactions. In addition, removal of dimethyl sulfide for reuse of the solvent THF adds additional steps in the synthetic process. Therefore, as the demand for large quantities of amine-boranes increases, there is a need for more effective methods for making ammonia borane and amine-boranes.

Researchers at Purdue University have developed several new procedures to efficiently make ammonia borane and amine boranes in large quantities. In addition, due to the stability of sodium borohydride (SBH) and ammonia borane in water, water can be used in the production process, allowing for an efficient, cost-effective synthesis of ammonia borane from SBH.

Advantages:
-Simplest possible synthesis of ammonia borane from sodium borohydride
-Prepare ammonia-borane in large quantities

Potential Applications:
-Method for making a more pure ammonia borane and amine borane

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