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RESEARCH ABSTRACT FORM

TITLE: Ammonia Borane – Studies In Stereoselective Reductions

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The most basic molecular boron-nitrogen compound, ammonia borane (NH_3BH_3), has recently attracted scientific attention as a stable hydrogen storage compound. This research is organized to develop an improved understanding of the intermediates formed and the origins and influences of the diastereoselectivities of this reducing reagent. The general reactivity and diastereoselectivity of ammonia borane was determined by performing organic reductions using 4-*t*-butyl-cyclohexanone and D-camphor as substrates, with regards to the effects of concentration and stoichiometry. Purity, selectivity, and conversion of the compounds were determined by gas chromatography, while nuclear magnetic resonance (NMR) was used to characterize the compounds. The data collected from the performed experiments suggest that ammonia borane had a higher degree of diastereoselectivity when reducing 4-*t*-butyl-cyclohexanone as opposed to D-camphor under identical conditions. Further evaluation and experimentation concerning this difference in selectivity would be needed to characterize the intermediates formed when ammonia borane is used as a reducing reagent. The remainder of this presentation discusses the general reactivity and diastereoselectivity of ammonia borane by evaluating the study of stoichiometry and concentration (dilution) effects of the reducing reagent.