

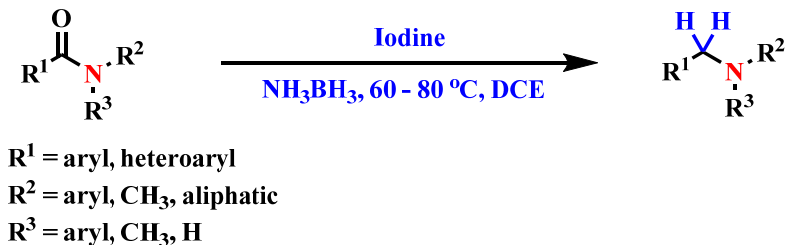
IN-SITU GENERATED μ -AMINODIBORANE FROM AMMONIA BORANE AND IODINE FOR DEOXYGENATIVE REDUCTION OF CARBOXAMIDES

Abhishek Nair and Anil J. Elias

Department of Chemistry, Indian Institute of Technology, Delhi, Hauz Khas,
New Delhi-110016, India.
eliasanil@gmail.com

Reduction reactions of carbonyl compounds are among the most important transformations with the carboxamide group being the most challenging to reduce. Among all the borane complexes, ammonia borane has proved to be an efficient solid hydrogen source that is stable in air and moisture and easy to handle. The use of AB as a reagent for carrying out various functional group transformations is well documented. In contrast, very little has been reported on the easy synthesis and utility of μ -aminodiborane (μ -ADB) as a reagent for organic functional group transformations.

Herein, we report a new, simple and cost-effective method for the reduction of amides to amines using *in-situ* generated μ -ADB from the reaction of AB and elemental iodine (I_2) (Scheme 1). This method is applicable to various secondary, tertiary amides and trifluoroamides with yields in the range of 67-94%. Moreover, this protocol has been found to be useful for preparing pharmaceutically important compounds as well. Control experiments and mechanistic studies indicate that the active reagent in case of reduction of secondary amides is μ -ADB and in the case of tertiary amides, it is NH_2BH_2 .



Scheme 1: Reduction of secondary and tertiary amides to corresponding amines by using ammonia-borane and iodine