Nano-spinel catalyzed reduction of imines to amines by sodium borohydride

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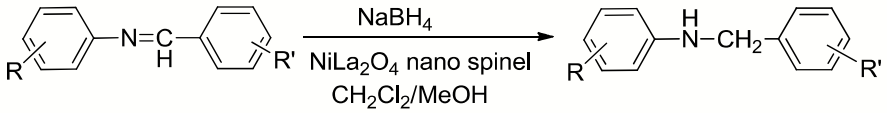
Two approaches commonly used for the reduction of imines to amines are catalytic hydrogenation and hydride reduction employing lithium aluminum hydride or sodium borohydride. Catalytic hydrogenation and lithium aluminumhydride are difficult methods because of high pressure is frequently required for catalytic hydrogenation [1] and also $LiAlH_4$ have to be carried out in a dry organic solvent in an inert atmosphere.[2,3]

In this study, various derivatives of imines were synthesized according to the accepted procedures. The purity, physical and spectral data of the starting materials were totally confirmed. Then, the model reaction was selected and the optimal reaction conditions were investigated to find the catalyst ratio, reduction reagent concentration, temperature, solvent, etc. Consequently, the reduction reactions of various derivatives of imines were studied with $NaBH_4$ in the presence of catalytic amount of $NiLa_2O_4$nanospinel as catalyst. The overall environmentally friendly and easily work-up reactions were conducted at room temperature in short reaction times with excellent yields. The catalyst was also recovered and reused several times.



References:

1. Kascheres, A.; Rodrigues, R. A. F. *Tetrahedron* **1996**, 52, 1291.
2. Liu, P. S. *J. Org. Chem.* **1987**, 52, 4717.
3. Shawe, T. T.; Sheil. *J. Org. Chem.***1994**, 59, 5841.