



Efficient indium-mediated dehalogenation of aromatics in ionic liquid media

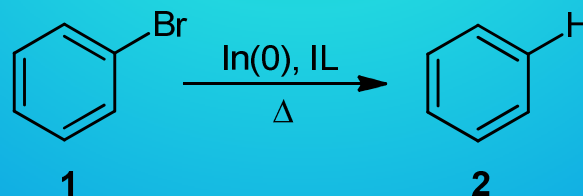


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In the field of synthetic organic chemistry, the dehalogenations are common and interesting reactions.¹ Within the broad range of conditions for carrying out such reactions, the use of indium is of particular interest because it can be utilized in different organic solvents (THF, toluene, etc.), in water, and without solvent. As a preliminary study, we propose the use of ionic liquid as alternative solvent to carry out dehalogenation reactions.

Dehalogenation of aromatics compounds was investigated by a series of reactions under several conditions. Bromobenzene was used as a starting material and we tested this procedure changing the IL, as shown in the following scheme:



Scheme 1

Our experimental results indicate that [bmim]Br is the most effective solvent for this reaction.

1. Alonso, F.; Beletskaya, I.; Yus, M. *Chem. Rev.* **2002**, *102*, 4009-4091.

To explore the scope of this dehalogenation reaction, we investigated the behavior of others haloaromatics and haloheteroaromatics systems using indium under [bmim]Br conditions (Figure 1). The yields of dehalogenated products were in the moderate to excellent range.

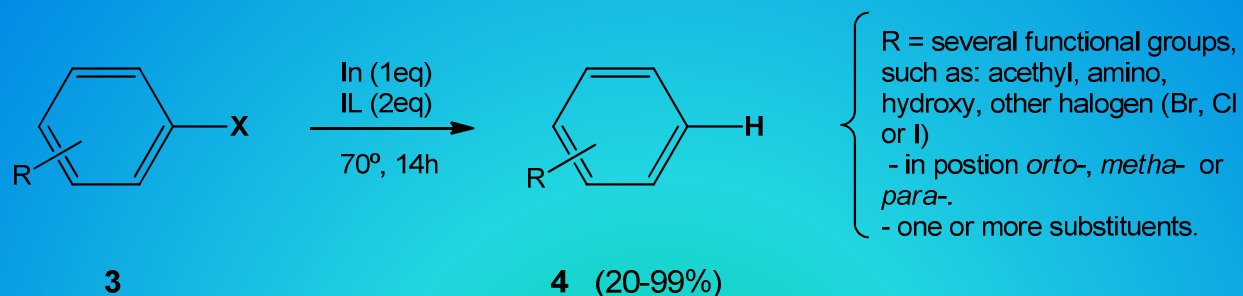
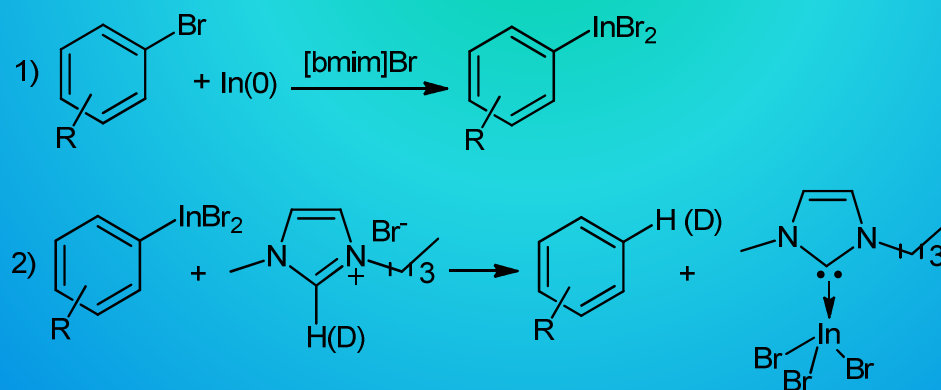


Figure 1

This methodology was successful for some heteroaromatic systems, such as pyridine or thiophene derivatives (60-99%). A plausible mechanism for this reductive dehalogenation is shown in Scheme 2, and was verified using deuterated-IL (step 2, Scheme 2).



Scheme 2

In conclusion, we have demonstrated that a reductive system consisting of an indium powder in ionic liquid allows a highly conversion of haloaromatics and haloheteroaromatics compounds.