

Photoinduced Reduction of Aryl Halides with Ligand–Borane Complexes

Laurent Chabaud,^a G. Lalande,^a M. Pucheault^a

Institut des Sciences Moléculaires, Bordeaux University
351 Cours de la libération 33405 Talence cedex - France
laurent.chabaud@u-bordeaux.fr

This study introduces a novel light-driven protocol for the selective reduction and deuteration of aryl halides (where X = I or Br), without requiring radical initiators^{1,2} or photoredox catalysts.³ The method uses borane complexes (L→BH₃ or L→BD₃) as efficient hydrogen or deuterium sources, enabling clean transformations under mild conditions.

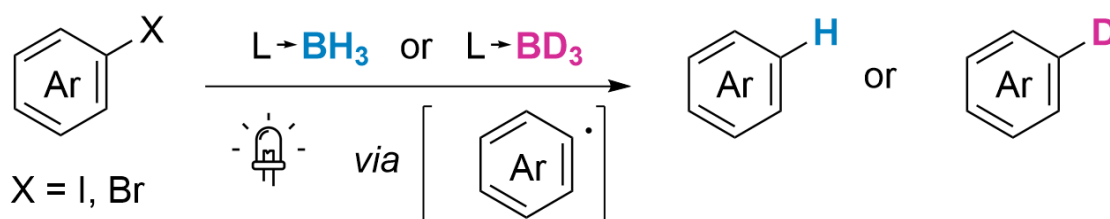


Figure 1. Photoinduced reduction and deuteration of aryl halides by ligand-borane complexes.

Mechanistic studies reveal a pathway that involves aryl radical intermediates. The reaction exhibits broad scope, accommodating diverse substrates and functional groups, while the use of deuterated boranes opens new opportunities for isotopic labeling.

1 S.-H. Ueng, M. Makhlouf Brahmi, É. Derat, L. Fensterbank, E. Lacôte, M. Malacria, D. P. Curran, *J. Am. Chem. Soc.*, **2008**, *130*, 10082.

2 S.-H. Ueng, L. Fensterbank, E. Lacôte, M. Malacria, D. P. Curran, *Org. Biomol. Chem.*, **2011**, *9*, 3415.

3 T. Taniguchi, *Chem. Soc. Rev.*, **2021**, *50*, 8995.