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Reductive Amination Reactions under Electrosynthesis Conditions

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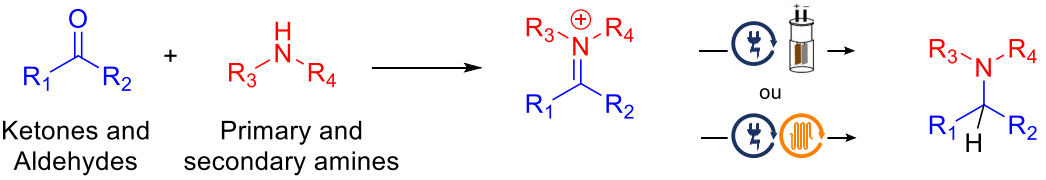
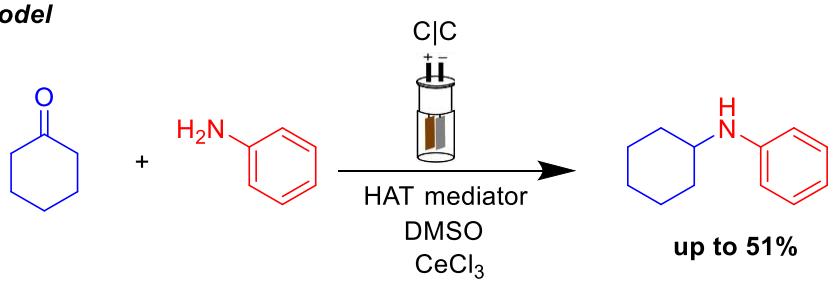
ABSTRACT

We present the investigation of the reductive amination of aldehydes and ketones with primary and secondary amines, focusing on the *in-situ* generation of the iminium ion (or imine) and its electrochemical reduction. Given the limited precedents for this reaction under electrochemical conditions with respect to conditions,[1] our methodology involves the screening of various electrodes, including graphite carbon, glassy carbon, magnesium, platinum, and copper. Additionally, we aim to determine the optimal solvents, electrolytes, and concentration conditions to enhance efficiencies in batch cells, which will later be applied to continuous flow electrochemical reactors. By optimizing these parameters, we seek to develop a robust and efficient protocol for reductive aminations under electrochemical conditions, and then transposing this methodology for valuable API synthesis.[2] So far, we have investigated the reaction between cyclohexanone and aniline, thus achieving the corresponding secondary amine in up to 51% yield.

Methodology



Reaction Model



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