

Borohydride Ionic Liquids as Reductants of CO₂ in the Selective N-formylation of Amines

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Streszczenie

Borohydride imidazolium ionic liquids, [IL]BH₄, used for the first time as reductants in the N-formylation of various amines with CO₂, provided an excellent yield of formamides. Under the same conditions, 5 bar CO₂ and 80 °C, NaBH₄ produced a mixture of N-formylated and N-methylated products in a ratio of 1 : 2. An alternative approach, based on the addition of halide imidazolium salts ([IL]Cl or [IL]Br) to the reactions of amine with NaBH₄ and CO₂, resulted in a significant increase of selectivity to formamide. However, no effect was noted for [IL]BF₄ and [IL]PF₆. Monitoring the reaction course in time using ¹H NMR brought about new insight into the role of BH₃ in the reduction of CO₂ and the functionalization of amines. The formation of N-methylaniline – borane intermediate was evidenced.

Słowa kluczowe

carbon dioxide, ionic liquid, sodium borohydride, amine-borane, N-formylation

Adres publiczny

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