Methyl Formate as a Reducing Agent for Reductive Amination: New Approach for C-N bond formation

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Reductive amination plays a key role in organic synthesis and pharmaceutical chemistry owing to its synthetic merits and ubiquitous presence of amines among biologically active compounds. Various reducing agents for reductive amination are known but the main problem of common reducing agents is a balance between activity and selectivity. New selective and active reducing agents for the amination are of a big interest for modern chemists. Carbon monoxide is a highly efficient reductant for reductive amination due to its both selectivity and activity. The main problem of carbon monoxide usage on laboratory scale is its inconvenience because of the necessity of CO cylinder and high toxicity of this compound to people. We were interested if there is a suitable and safe precursor for CO to use in laboratory practice and we found one. It is methyl formate. It’s nontoxic, cheap, easily available and non-corrosive comparing to formic acid. We developed new protocol for reductive amination with methyl formate and investigated substrate scope for this protocol and proved universality of our method for different types of compounds. Structure and purity of all obtained compounds were confirmed with 1H NMR, 13C NMR and GCMS.

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