Title: NaY zeolite functionalized by sulfamic acid/$Cu(OAc)_2$ as a new and reusable heterogeneous hybrid catalyst for efficient solvent-free formylation of amines

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Original article

NaY zeolite functionalized by sulfamic acid/$Cu(OAc)_2$ as a new and reusable heterogeneous hybrid catalyst for efficient solvent-free formylation of amines

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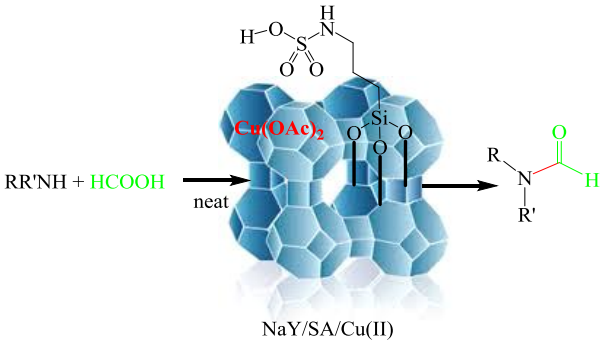
Graphical Abstract



Chemoselective *N*-formylation of amines with formic acid was achieved using NaY/SA/Cu(II) as a new, recyclable and efficient hybrid catalyst. Excellent yields, very short reaction times, solvent-free and mild reaction conditions are prominent advantages of this new protocol.

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ABSTRACT

NaY zeolite functionalized by sulfamic acid/$Cu(OAc)_2$ [NaY/SA/Cu(II)] was synthesized and used as a new, efficient and recyclable catalyst for preparation of formamides. This novel organic-inorganic hybrid catalyst was characterized by several techniques such as FT-IR, XRD, SEM, EDX and TG analysis. Chemoselectivity, easy procedure, excellent yields, very short reaction times, solvent-free and mild reaction conditions are some benefits of this new protocol.

1. Introduction

Formamides are important intermediates in organic synthesis [1, 3], and are also precursors for preparation of formamidine, isocyanides [2] and many pharmaceutically important heterocycles, such as flouroquinolines [3], oxazolidinones [4], 1,2-dihydroquinolines [5], substituted arylimidazoles [1] and cancer chemotherapeutic compounds [6]. In addition, formyl group has been

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