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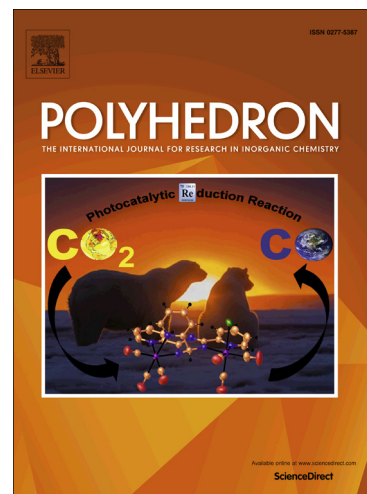
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Cu-Fe layered double hydroxide derived mixed metal oxide: Environmentally benign catalyst for Ullmann coupling of aryl halides

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Abstract

Solid mixed metal oxide derived from Cu-Fe-layered double hydroxide by its thermal decomposition at 600 °C has been demonstrated as novel ligand free catalyst for the synthesis of biphenyls through C-C coupling. The catalytic efficiency of this material has been studied by varying the solvents and bases, thereby their influence in controlling the product formation. The C-C coupling yield of aryl halides were found to be higher, when dimethylformamide and potassium carbonate used as a solvent and base respectively. The catalyst can be easily separated from the reaction mixture, simply by filtration and reused several times without significant loss of its activity. The mixed metal oxide has been characterized by XPS, XRD, SEM, BET, TG analysis and the role of calcined Cu-Fe layered double hydroxide in catalyzing C-C coupling reaction was proposed. Moreover, it is ligand-free C-C coupling reaction and is promising alternative than the conventional homogeneous and heterogeneous Pd catalysts.

Keywords: Cu-Fe-hydrotalcite; Heterogeneous Catalysis; Ullmann coupling, Biaryls

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