

Copper on Chitosan: recyclable heterogeneous catalyst for azide-alkyl cycloaddition reactions in water

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Supporting information

Experimental procedure for synthesis of Chitosan copper catalyst (Chit-CuSO₄):

Chitosan (5 g, medium molecular weight, Aldrich, CSA # 9012-76-4) was suspended in 100 mL of water. To this suspension, 1 g of CuSO₄.5H₂O was added and stirring was continued for 2h. The catalyst was separated using centrifuge (5000 rpm 5 min), dried under vacuum at 50 °C. The catalyst was characterized by X-ray diffraction (XRD) (Fig 1b, MS) and using SEM (Fig.1 a, MS). The signals pertaining to copper metal were not detected in XRD; it may be due to complexation with chitosan or low percentage. The weight percentage of copper was found to be 5.1 % by inductively coupled plasma-atomic emission spectroscopy (ICP-AES) analysis.

Synthesis of triazole from alkyl azide and alkyne

1.2 mmol of alkyl azide, 1.0 mmol of alkyne and 5 mg of Chit-CuSO₄ catalyst were placed in a reaction tube. To this, 5 mL of water and a stirring bar was added. The reaction tube was placed on a magnetic stirrer and the reaction mixture was stirred for 4-12 h at room temperature. After the completion of the reaction, product was separated by extraction using ethyl acetate and the catalyst was separated by centrifugation (5000 rpm, 5 min). The products were purified by recrystallization or column chromatography. The recovered catalyst was dried and reused at least five times without losing its activity.





































































