

Cu(II)-hydrazide coordination compound supported on silica gel as an efficient and recyclable heterogeneous catalyst for green click synthesis of β -hydroxy-1,2,3-triazoles in water.

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Streszczenie

A hydrazone ligand, (*E*)-6-(2-((2-hydroxynaphthalen-1-yl)methylene)hydrazinyl)nicotinohydrazide (H_2L), was synthesized and characterized by spectroscopic methods. The reaction of H_2L with $CuCl_2 \cdot 2H_2O$ in methanol gave Cu(II) coordination compound, $[Cu(HL')(Cl)] \cdot CH_3OH$ (**1**), which was characterized by elemental analysis and spectroscopic methods (Fourier transform infrared (FT-IR) and UV-vis). The structure of **1** was also determined by single-crystal X-ray analysis. Structural studies confirmed the formation of esteric group during the synthesis of **1**. Compound **1** was immobilized on 3-aminopropyltriethoxysilane (APTS)-functionalized silica gel through the amidification reaction and the obtained heterogeneous coordination compound was utilized as a catalyst for the three-component azide-epoxide-alkyne cycloaddition reaction in water as a green solvent. The structural properties of the heterogeneous catalyst were characterized by a combination of FT-IR, UV-vis, thermogravimetric analysis (TGA), scanning electron microscopy (SEM) and energy-dispersive spectrometry (EDS) analyses. The effect of the amount of catalyst and temperature on the cycloaddition reaction was studied, and the obtained 1,2,3-triazoles were characterized by spectroscopic studies and single-crystal X-ray analysis. The catalytic investigations revealed that this catalytic system has high activity in the synthesis of β -hydroxy-1,2,3-triazoles. It was also found that the aromatic and aliphatic substituents on the alkyne and epoxide together with the reaction temperature have considerable effects on the activity and regioselectivity of this catalytic system.

Słowa kluczowe

Silica, Addition reactions, Coordination compounds, Catalysts, Ethers

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