

Facile synthesis of a luminescent copper(I) coordination polymer containing a flexible benzotriazole-based ligand : an effective catalyst for three-component azide-alkyne cycloaddition

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Abstract

A straightforward method for the synthesis of a new luminescent copper(I) coordination polymer (CP) containing the ligand 1,3-bis(1H-benzotriazol-1-ylmethyl)benzene (L) through a self-assembly process with copper(I) iodide is reported. The CP was characterized by infrared, NMR, UV–Vis and photoluminescence spectroscopy, high resolution mass spectrometry (ESI), elemental and thermogravimetric analyses, single-crystal and powder X-ray diffraction, and relativistic density functional theory calculations. Furthermore, this one-dimensional copper(I) benzotriazole-based coordination polymer catalyzed the three-component azide-alkyne cycloaddition reaction to obtain 1,4-disubstituted 1,2,3-triazoles in good to excellent yields (up to 95%) from organic halides, sodium azide and terminal alkynes..

Keywords

Copper(I) coordination polymer, Luminescence, Catalysis, Azide-alkyne cycloaddition, Click chemistry.