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**Catalytic performance of a new 1D Cu(II) coordination polymer  
{Cu(NO<sub>3</sub>)(H<sub>2</sub>O)}(HTae)(4,4'-Bpy)**

E.S. Larrea<sup>1</sup>, R. Fernández de Luis<sup>2</sup>, M. Iglesias<sup>3</sup>, M.I. Arriortua<sup>\*1,2</sup>

<sup>1</sup>Universidad del País Vasco, Spain, <sup>2</sup>BCMaterials (Basque Center for Materials, Applications & Nanostructures), Spain, <sup>3</sup>Instituto de Ciencia de Materiales de Madrid-CSIC, Spain

There has been extensive interest in the synthesis and design of new porous coordination polymers [1] because of their potential applicability in different areas. One interesting crystal engineering approach to construct new coordination polymers is the selection of metal chelating ligands different from those commonly used. [2] In this regard, the  $\beta$ -diketonates, and concretely the metal  $\beta$ -diketonates, have been recently started to be used as structural building blocks in coordination polymers. [3] Deprotonated  $\beta$ -diketonates act as metal chelating agents; hence, in order to obtain extended structures other substituents are necessary to make them act as bridging ligands. This is the case of bis( $\beta$ -diketonate) 1,1,2,2-tetraacetylthane (H<sub>2</sub>Tae) which can act as bischelating ligand bridging two metal centres. During the course of our research with the system Cu–Tae–4,4'-Bpy, we have obtained the 1D {Cu(NO<sub>3</sub>)(H<sub>2</sub>O)}(HTae)(4,4'-Bpy) coordination polymer.[4] The crystal structure consists in parallel and oblique {Cu(HTae)(4,4'-Bpy)} zig-zag metal-organic chains stacked along the [100] crystallographic direction. Copper atoms are in octahedral coordination environment linked to two nitrogen atoms of two bridging 4,4'-Bipy and to two oxygen atoms of one HTae molecule. The occupation of the other two positions varies from one copper atom to another with different combinations of water and nitrate molecules, giving rise to a commensurate super-structure. By means of thermal removal of water molecules we were able to obtain copper coordinatively unsaturated centres which could act as Lewis acid active sites in several heterogeneous catalytic reactions. Therefore, we have tested the anhydrous compound as heterogeneous catalyst for Knoevenagel condensation reactions.

{Cu(NO<sub>3</sub>)(H<sub>2</sub>O)}(HTae)(4,4'-Bpy) is an efficient catalyst for the condensation of benzaldehyde and malonitrile in mild conditions (60 °C in toluene, 5 % catalyst). The scope of the reaction was studied with various substrates. Recycling and leaching tests were also performed.

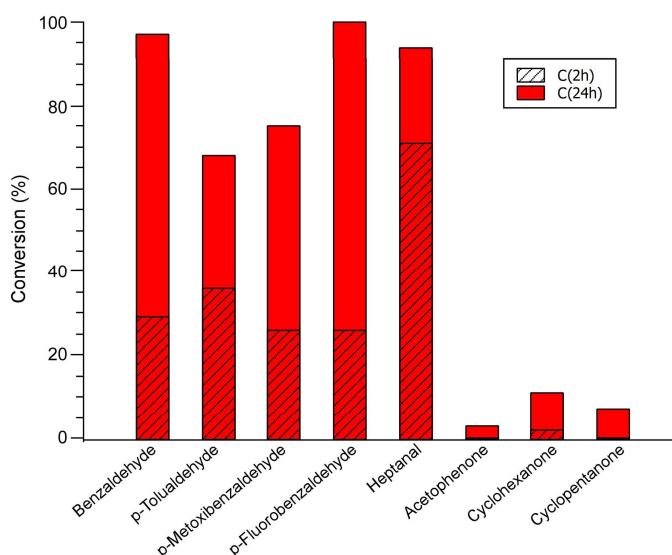


Fig. 1. Catalytic conversion percentages of various substrates for Knoevenagel condensation with malonitrile.

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