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SYNTHESIS OF TRIAZOLE USING NANOPARTICLES OF CuI AS CATALYST

¹M.Kardani, ²A. zarei Ahmady

¹Department of Medicinal Chemistry, School of Pharmacy, Nanotechnology

Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

m.kardaani@yahoo.com

²Department of Medicinal Chemistry, School of Pharmacy, Nanotechnology

Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

zareai-a@ajums.ac.ir

Abstract

In this study synthesis of high efficiency 1, 2, 3 triazole compounds were described. Triazole ring was formed in presence of CuI as catalysts. Product was characterized with FT-IR and NMR analysis.

Keywords: Synthesis, triazole, catalyst

1-INTRODUCTION

1, 2, 3 triazole are an important class of heterocyclic compound and have different application in biological conjugation (1) polymer chemistry (2) and pharmacophores in medicinal chemistry (3). These compounds were synthesized by cycloaddition between azide and alkyne group. Cyclization occurs in thermally condition. But in high temperature unstable compound decompose. triazole 1,2,3 triazole can be synthesized according to click reaction under mild conditions with high efficiency. In this procedure carbon- heteroatom- carbon bonds were constructed. Copper catalyst is used in this reaction. Different copper catalyst have been developed to produce triazole (4, 5, 6). In this work we reported CuI nanoparticle as suitable catalyst for click reaction.

2-EXPERIMENTAL

2-1-Synthesis of 4-propynyloxy benzaldehyde

The intermediate 4-propynyloxy benzaldehyde was prepared by reaction of 4 hydroxy benzaldehyde and propargyl bromide with molar ratio 1:1, this reaction was done in acetone as solvent in presence K₂CO₃ and tetra butyl ammonium bromide (20 mol %) at room temperature for overnight. Then extraction was done in ethyl acetate and water. Ethyl acetate phase dried over anhydrous calcium chloride then solvent evaporated under vacuum the crude product obtained by recrystallization from ethanol and water. Product was characterization using IR spectra.

2-2-Synthesis of azide

To prepare azide, the mixture of sodium azide and 2,4 dibromo acetophenone with molar ratio 1.8:1 and tetrabutyl ammonium bromide (20 mol %) stirred in acetone at room temperature for 2h. purification was done according to section 2-1. Compound was evident by IR spectra. Acetone was removed under reduced pressure and extracted by ethyl acetate and water. Ethyl acetate layer was dried using calcium chloride, and evaporated under vacuum to provide red liquid.

2-3-Synthesis of triazole