University of zabol
Graduate School
Faculty of Science
Department of Chemistry
The Thesis Submitted for the Degree of Master of Science
(In the field of organic chemistry)

Design and synthesis of a new nanocatalyst based on surface modification of mesoporous MCM-41 nanoparticles and its application in the synthesis of pyrimidine derivatives

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February 2021

Abstract

Pyrido[2,3-d]pyrimidine derivatives are a group of precious heterocyclic building blocks which are studied widely because of their abundant medicinal and pharmaceutical applications. These compounds have shown a widespread array of biological and medicinal properties. Some of these applications include antiallergens, anti-inflammatory and antitumor agents, human platelet aggregation inhibitors and antivirus and antibacterial agents. So, the discovery of novel catalytic methodologies toward the synthesis of these compounds is an active area of research. Nanoporous materials are extremely significant because of characteristics such as high surface area and a great ability for interaction with molecules, atoms and ions from theoretical and applied viewpoints. These materials have been the subject of many efforts toward designing and development of novel nanocatalysts in the past few decades. In the presemt study, a novel nanocatalyst based on surface modification of MCM-41 mesoporous nanoparticles was prepared and applied for the synthesis of pyrido[2,3-d]pyrimidine derivatives through a multicomponent reaction as a invaluable basis of diversity oriented organic synthesis. The nanocatalyst was prepared by aminpropylation of MCM-41 followed by reaction with choline chloride at 100°C in toluene as solvent. The nanocatalyst was then characterized by XRD, SEM, TEM, EDS and BET analyses. The prepared catalyst was then examined in the multicomponent synthesis of pyrido[2,3-d]pyrimidine derivatives. The products were synthesized within relatively short reaction times with very good to excellent yields without any laborious purification step.