



University of Zabol
Graduate school
Faculty of Science
Department of Chemistry

**The Thesis Submitted for the Degree of M.Sc
(in the field of Organic Chemistry)**

Design and synthesis of a novel nanocatalyst based on layered double hydroxide modified clinoptilolite and the study of their electrochemical properties and application in the synthesis of pyrido[2,3-d] pyrimidine derivatives

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Abstract

Pyrido[2,3-*d*]pyrimidine derivatives have shown a great deal of biological activities and medicinal application recently. Therefore, the attempts toward finding novel synthetic methods for the preparation of these derivatives have attracted organic and medicinal chemist's attention more recently. Layered double hydroxide solids containing two different ions with 2+ and 3+ charges in their structure have shown a broad range of application in various scientific and industrial areas most recently. We can refer to two of the most important application as pollution removal and catalyst for organic synthesis. In this research, we have come up with designing a novel nanocomposite by surface modification of natural clinoptilolite with using ZnFe layered double hydroxide in order to be used as a nanocatalyst for the preparation of Pyrido[2,3-*d*]pyrimidine derivatives. First, this nanocatalyst was examined to find the optimized reaction condition under different thermal and solvent conditions. Then, the optimized reaction condition was applied to the preparation of all Pyrido[2,3-*d*]pyrimidine derivatives. The derivatives were all prepared simply with very yields with no need for laborious purification step according to the proposed methodology.

Keywords: layered double hydroxide, natural clinoptilolite, Nanocatalyst, pyrido[2,3-*d*]pyrimidine.