

عنوان مقاله:

One-Pot Synthesis of 1,4-Dihydropyridines via Hantzsch Reaction Using Nano-kaolin/BF₃/Fe₃O₄ as a Green Catalyst under Solvent-Free Conditions

محل انتشار:

بیست و ششمین سمینار شیمی آلی ایران (سال: 1397)

تعداد صفحات اصل مقاله: 1

نویسندگان:

Abdolhamid Bamoniri - *Department of Organic Chemistry, Faculty of Chemistry, University of Kashan, Kashan, Iran*

Reza Mohammadi Pour - *Department of Organic Chemistry, Faculty of Chemistry, University of Kashan, Kashan, Iran*

Bi Bi Fatemeh Mirjalili - *Department of Organic Chemistry, Faculty of Chemistry, Yazd University, Yazd, Iran*

خلاصه مقاله:

Dihydropyridine derivatives exhibit a large range of biological activities. They have been used as anticonvulsant, 1,4 antidepressive, antianxiety, analgesic, antitumoral, hypnotic, vasodilator, bronchodilator and anti-inflammatory agents [1]. Some of them, such as amlodipine, felodipine, isradipine, lacidipine and nifedipine are effective drugs as calcium-channel blockers for the treatment of cardiovascular diseases and hypertension. 1,4-dihydropyridines are also good precursors of the corresponding substituted pyridine derivatives and constitute useful reducing agents for imines in the presence of a catalytic amount of Lewis acid [2]. Hantzsch first reported in 1882 the one-pot three-component condensation of an aldehyde with ethylacetoacetate (or 1,3-dicarbonyl compounds) and ammonia (or ammonium acetate) in acetic acid or refluxing alcohol [3]. Yields of the resulting 1,4-dihydropyridines are usually modest and in recent years, several new efficient methods have been developed including the use of microwaves, ionic liquids, TMSI-NaI, metal triflates, molecular iodine, SiO₂/NaHSO₄, SiO₂/HClO₄, ceric ammonium nitrate, Na- and Cs-norit carbons, tetrabutylammonium hydrogensulfate, fermenting baker's yeast, and organocatalysts [4]. In this study, we report our results for the synthesis of 1,4-dihydropyridines by a one-pot cyclocondensation of aldehyde with ethyl acetoacetate and ammonium carbonate using nano-kaolin/BF₃/Fe₃O₄ as a magnetic catalyst under solvent-free conditions (Fig.1). The advantages of this study involve the use of solvent-free conditions, an easy experimental work-up system, rapidity, recyclable catalyst and green process.

کلمات کلیدی:

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