

عنوان مقاله:

Nano γ - Alumina supported boron trifluoride as a novel solid acid catalyst for the synthesis of pyrroles at room temperature under solvent-free condition

محل انتشار:

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تعداد صفحات اصل مقاله: ۱

نویسندگان:

Abdolhamid Bamoniri - Department of Organic Chemistry, Faculty of Chemistry, University of Kashan, Kashan, I.R. Iran

Mahnaz Mahmoodi Fard Chegeni - Department of Organic Chemistry, Faculty of Chemistry, University of Kashan, Kashan, I.R. Iran

خلاصه مقاله:

Pyrroles are a significant category of heterocyclic compounds and are structural units contained in an immense array of natural products, synthetic material, and bioactive molecules, like heme, vitamin B₁₂, and cytochromes [1]. Because of these properties, synthesis of pyrrole derivatives has an important role in heterocycle chemistry and there is increasing interest in the synthesis of this kind of compounds [2]. There are several methods for the synthesis of pyrrole derivatives. Generally, these methods are based on the cyclocondensation reactions. Classical procedures for the synthesis of pyrroles include the Knorr, Hantzsch, and Paal-Knorr condensation reactions. In the Paal-Knorr reaction, α,β -dicarbonyl compounds are converted to pyrroles in the presence of ammonia or primary amines [3]. Recently, many catalysts have been used for this conversion such as montmorillonite KSF, Bi(NO₃)₃·5H₂O, Sc(OTf)₃, layered zirconium phosphate, zirconium sulfophenyl phosphonate, silica sulfuric acid (SSA) [4]. However, some of these methods suffer from certain drawbacks such as prolonged reaction times, use of volatile or hazardous organic solvents, tedious conditions, use of extra energy source, and toxic metals. Herein, We wish to report a simple, clean, practical and efficient method for the synthesis of pyrrole derivatives by nano γ -Al₂O₃/BF₃ as heterogeneous catalyst under solvent-free condition at room temperature (Scheme 1). This synthetic procedure has several advantages, including the availability, safety, and reusability of the catalyst, high yields, short reaction times and also has an environmentally benign nature in agreement with the concepts of green chemistry.

کلمات کلیدی:

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