

Sulfonic Acid Functionalized Ionic Liquid in Combinatorial Approach: A Recyclable and Water Tolerant-Acidic Catalyst for Friedlander Quinoline Synthesis

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Abstract : Quinolines are very important compounds partially because of their pharmacological properties which include wide applications in medicinal chemistry. notable among them are antimalarial drugs, anti-inflammatory agents, antiasthmatic, antibacterial, antihypertensive, and tyrosine kinase inhibiting agents. Despite quinoline usage in pharmaceutical and other industries, comparatively few methods for their preparation have been reported. The Friedlander annulation is one of the simplest and most straightforward methods for the synthesis of poly substituted quinolines. Although, modified methods employing lewis or brønsted acids have been reported for the synthesis of quinolines, the development of water stable acidic catalyst for quinoline synthesis is quite desirable. One of the most remarkable features of ionic liquids is that the yields can be optimized by changing the anions or the cations. Recently, sulfonic acid functionalized ionic liquids were used as solvent-catalyst for several organic reactions. We herein report the one pot domino approach for the synthesis of quinoline derivatives in Friedlander manner using TSIL as a catalyst. These ILs are miscible in water, and their homogeneous system is readily separated from the reaction product, combining advantages of both homogeneous and heterogeneous catalysis. In this reaction, the catalyst plays a dual role; it ensures an effective condensation and cyclization of 2-aminoaryl ketone with second carbonyl group and it also promotes the aromatization to the final product. Various types of quinolines from 2-aminoaryl ketones and β -ketoesters/ketones were prepared in 85-98% yields using the catalytic system of SO₃-H functionalized ionic liquid/H₂O. More importantly, the catalyst could be easily recycled for five times without loss of much activity.

Keywords : antimalarial drugs, green chemistry, ionic liquid, quinolines

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