One-Pot Synthesis of Indole derivatives Catalyzed by SBA-15-Pr-SO_3H as a Nanoporous Acid

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Abstract

An effective one-pot synthesis of indole derivatives using functionalized SBA-15 as Brønsted acid. It efficiently catalyzed synthesis of indole derivatives through the Fischer Indole reaction. One pot synthesis procedure, mild reaction conditions, and simple workup are attractive features of this method.

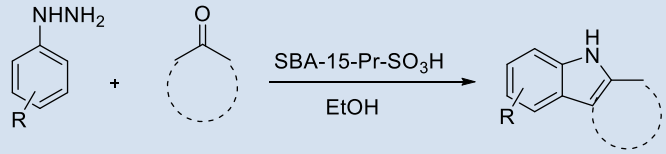
Introduction:

Due to indole structure ubiquity in nature and its broad application in chemistry, indole derivatives are valuable heterocycles. Numerous methods have been developed for the synthesis of indole derivatives and more efficient straightforward synthetic strategies still continue to be pursued. Fischer Indole method is one of the most powerful routes of indole synthesis. In view of the versatility of indoles and its derivatives in material sciences, There is an increasing sensitivity for environmental protection and using green methodologies for effecting the Fischer indole synthesis. We were interested in developing a new, easy workup procedure with high yielding synthetic protocol for indole derivatives using modified SBA-15 with HO_3S-functional group as a recyclable and environmentally benign catalyst.

Methods and Results: To develop Indole scaffold we considered a reaction of phenylhydrazine or its nitro derivatives, a ketone (typically, cyclohexanone), and SBA-15-Pr-SO_3H as Brønsted acid. The present methodology also offers the advantages of excellent yields, short reaction time, and milder reaction conditions. All the synthesized compounds were characterized by ^1H NMR, IR spectral data.

Conclusions:

The target compounds were obtained from phenylhydrazines and ketones with good to excellent yields.



Key words: Synthesis, Fischer indole, Phenylhydrazine, SBA-15-Pr-SO_3H.