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Synthesis of a Novel, Efficient and Reusable Fe(II) Carboxymethylcellulose Catalyst and its Catalytic Activity in the Synthesis of 1,4-dihydropyrano [2,3-c] Pyrazole Derivatives

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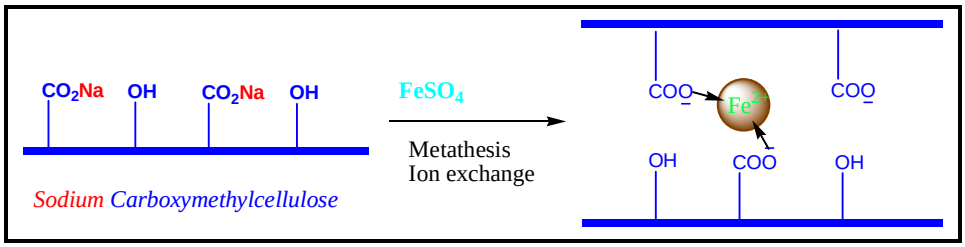
ABSTRACT

Simple and efficient method for the synthesis of 1,4-dihydropyrano[2,3-c]pyrazole derivatives has been developed by one-pot four-component reaction of various aldehydes, malononitrile, ethyl acetoacetate and phenyl hydrazine in the presence Fe(II)CMC as a novel, nanocomposite heterogeneous and reusable catalyst. In this method, Fe(II)CMC was prepared and characterized by SEM and FT-IR techniques. The catalyst was recovered and reused for several cycles without considerable loss of activity. The advantages of the protocol include rapid reactions with good yields, simple workup, and easy isolation of products. The synthesized compounds were characterized by FT- IR, ^{1}H NMR, and ^{13}C NMR spectroscopic technique.

Graphical Abstract



Schematic route for preparation of Fe (II) CMC catalyst.

Keywords: Fe(II) carboxymethylcellulose, Multi-component reaction, Nanocomposite catalyst, Pyranopyrazole.