



Synthesis of 6-Amino-2, 4-Dihydropyrano-[2, 3-c]Pyrazol-5-Carbonitriles Catalyzed by Cerium(IV)carboxymethylcellulose under Solvent-Free Conditions

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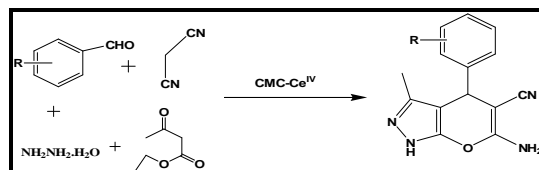
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ABSTRACT

An efficient, high-yielding, and rapid protocol has been developed for the synthesis of 6-amino-2,4-dihydropyrano[2,3-c]pyrazol-5-carbonitriles derivatives via a one-pot, four-component, reaction of hydrazinehydrate, ethyl acetoacetate, aldehydes, and malononitrile using Cerium(IV) carboxymethylcellulose as expeditious reusable heterogeneous catalyst. The protocol proves to be efficient and environmentally benign in terms of very easy workup, good yields, and ease of recovery of catalyst.

Graphical Abstract



Synthesis of 6-amino-4-aryl-3-methyl-2,4-dihydropyrano[2,3-c]pyrazole-carbonitriles catalyzed by CMC-Ce (IV) under solvent free conditions

Keywords: Heterogeneous catalyst, Cerium(IV) carboxymethylcellulose, Four-component reaction, pyrano[2,3-c]pyrazole.