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Synthesis of Pyranopyrazoles Using Lanthanum Ferrite as Efficient and Reusable Heterogeneous Catalyst

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Abstract:

Heterogeneous ferrite catalysis plays a vital role in many organic preparations for design and synthesis of new organic moieties. Efficient and sustainable ferrites catalysts have received considerable attention in the field of heterogeneous catalyst and actively participated in the development of greener reaction protocols for providing a suitable support. Lanthanum ferrite as efficient and reusable heterogeneous catalyst were found to be efficient for the synthesis of pyranopyrazoles by a four-component reaction of a mixture of hydrazine hydrate, ethyl acetoacetate, aldehydes/ketones and malononitrile under solvent free condition. The catalyst was characterized by XRD, SEM and FT-IR studies. The advantages of these protocols are its greenness with respect to mild reaction conditions, short reaction time, operational simplicity and high yields. Ferrite catalysts can be easily recovered from reaction medium and reused up to several runs almost without loss of catalytic activity. Synthesized compounds were confirmed by using FT-IR, ^{1}H & ^{13}C NMR spectroscopic data and melting points compared with reported values.

Key words: Multicomponent reaction, pyranopyrazoles, lanthanum ferrite, heterogeneous catalyst