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Nanomagnetic Cu(II) complex catalyzed synthesis of 2-amino-3-cyano-4H-chromenes

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Heterocyclic systems, in particular oxygen-containing structures, constitute a privileged group of compounds based on their wide range of biological activity. Derivatives of 4H-chromenes have attracted attention because of containing a pharmacophore group that is found in many molecules with pharmacological effects, including anticancer, antifungal, antibacterial, antioxidant, and antiprotozoal agents [1]. 1,10-Phenanthroline-5,6-dione (phendione)-based transition-metal complexes are known for their use in pharmacological and catalysis applications [2,3]. In this work, a novel Fe_3O_4-supported Cu(II)-complex catalyst was synthesized via functionalization of the Fe_3O_4 surface as a support by acetylacetone, followed by treatment with $CuCl_2$ and phen-dione ligands, and identified by Fourier transform infrared spectroscopy (FT-IR), feld emission scanning electron microscopy (FE-SEM), X-ray difraction spectroscopy (EDX), thermogravimetric analysis (TG), and X-ray powder difraction (XRD). The catalytic activity of the Lewis acid catalyst has been successfully examined in a one-pot, three-component condensation reaction of aromatic aldehydes, Lawsone, and malononitrile in ethanol under reflux conditions to furnish 2-amino-3-cyano-4H-chromenes. The proposed approach has some advantages, such as excellent yields, mild reaction conditions, short reaction times, the use of agricultural waste, and an eco-friendly nature.

***Keywords*:** Fe_3O_4; Copper catalyst; 2-amino-3-cyano-4H-chromenes; Levis acid catalyst.

References

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