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Reusable $ZnCr_2O_4$ Nano Catalyzed One Pot Three-Component Cycloaddition Reaction for Synthesis of Azetidine Derivatives under Ultrasound Irradiation

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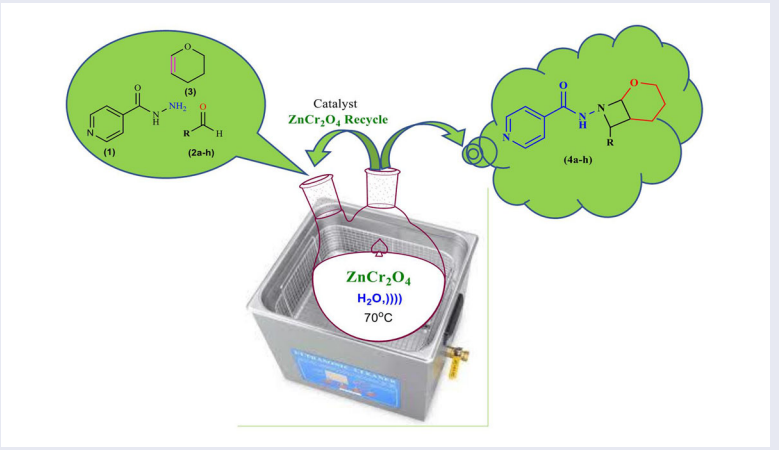
ABSTRACT

A versatile and effectual, three-component one pot ($2\pi + 2\pi$) cycloaddition reaction to the synthesis of substituted azetidines in the excellent yields is described. The reaction of isonicotinic acid hydrazide (**1**) as starting materials. Design and preparation of N-(7-R)-2-oxa-8-azabicyclo[4.2.0]octan-8-yl)isonicotinamide derivatives (**4a-h**) was carried out by condensation of isoniazid (**1**) with aromatic aldehyde (**2a-h**), $ZnCr_2O_4$ nano catalyzed one-pot cycloaddition of isoniazid Schiff base with pyran (**3**) under ultrasonic irradiation. Moreover, the Prepared $ZnCr_2O_4$ nanoparticles were easily recovered by corresponding solvent and reused for next synthesis of derivatives without significant loss of their catalytic activity. Prepared $ZnCr_2O_4$ nanoparticles were confirmed by XRD, EDX, TEM, HRTEM, TGA-DTA and all substituted azetidines were characterized by ^{1}H NMR, ^{13}C NMR, FT-IR, mass and elemental analysis.



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