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Sonochemical rate enhanced by a new nanomagnetic embedded core/shell nanoparticles and catalytic performace in the multicomponent synthesis of pyridoi-midazoisquinolines

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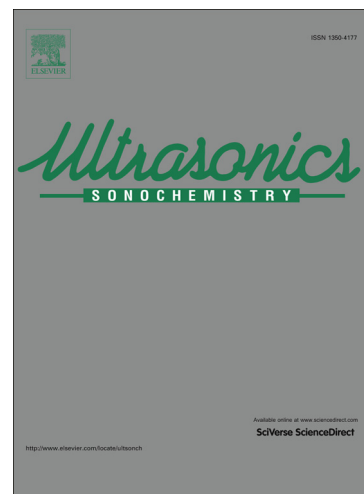
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**Sonochemical rate enhanced by a new nanomagnetic embedded  
core/shell nanoparticles and catalytic performace in the  
multicomponent synthesis of pyridoimidazoisquinolines**

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**Abstract**

A sonochemical approach for the one-pot three-component synthesis of pyridoimidazoisquinolines via by using phthalaldehyde, trimethylsilylcyanide and aminopyridines the presence of a catalytic amount of a new nanomagnetic catalyst  $\text{Fe}_3\text{O}_4@\text{SiO}_2\text{-CO-C}_6\text{H}_4\text{-NH}_2$  is described. The characterization of the nanocatalyst and the product was done by various methods, such as FT-IR, SEM, EDX, TGA/DTA, NMR, MS and CHN analyses. This is the first design, preparation, characterization and application of the present core/shell nanomaterial and also the first ultrasound irradiated synthesis of the biologically and pharmaceutically important fused polycyclic compounds in ethanol as a green solvent. This novel protocol offers several advantages such as high yields, short reaction times, environmentally-friendly reaction media, easily isolation of the products, simple preparation and recoverability of the nanocatalyst by an external magnet and reusing several times without significant decrease in catalytic activity.

**Keywords:** Sonochemistry; Ultrasonic irradiation; Core/shell magnetic nanoparticles; Nanostructure catalyst; Pyridoimidazoisquinolines; Green chemistry.

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