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One-Pot synthesis of 5-(4-Substituted Phenyl)-1,3,4-Thiadiazole-2-Amines derivatives Catalysed by $CeZrO_4$ Nanocatalyst

Komal Takankhar[a], Maqdoom Farooqui[b], Kshitija Tambe[b], Shivani raut[b], Ayesha Durrani[a]
Department of Chemistry
Dr. Rafiq Zakaria College for Women, Jubilee park, Chhatrapati Sambhajinagar, Maharashtra, India
takankharkomal99@gmail.com

Abstract: *By using co-precipitation method to synthesize $CeZrO_4$ nanoparticles as nanocatalysts, an environmentally friendly solution was developed to obtain 5-(substituted phenol)- [1,3,4] thiadiazol-2-amine derivatives. It is possible to impart optical properties to the obtained products to create nanostructures with active sites. X-ray diffraction and scanning electron microscope characterization methods were used to determine the effect of organic additives on the properties of nanopowders. Current research includes cyclic condensation reaction of substituted aromatic carboxylic acids and thiosemicarbazide under microwave irradiation using EtOH as solvent. The process was found to be simple, inexpensive and painless. This work adopted for present study because of safety, environmental protection, low cost and the use of non-toxic and non volatile, This work includes the direct condensation of aromatic carboxylic acids with thiosemicarbazide and $CeZrO_4$ nanoparticle, due to use of $CeZrO_4$ nanoparticle reaction completed in less time and the excellent results of thiadiazol-2-amine appeared. The current study reported the synthesis of substituted thiadiazole in a one-step reaction using nanocatalyst EtOH solvent shown good purity with excellent yield.*

Keywords: $CeZrO_4$ nanocatalyst, Co-Precipitation method, aromatic acids, Thiadiazole, Thiosemicarbazide, Pharmacological activity etc

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