



One Pot Catalyzed Synthesis of 1,3-bis (2-(4-hydroxyphenyl)-2-methyl-4,5-diphenyloxazol-3(2H)-yl) Thiourea and Its Antimicrobial Activity

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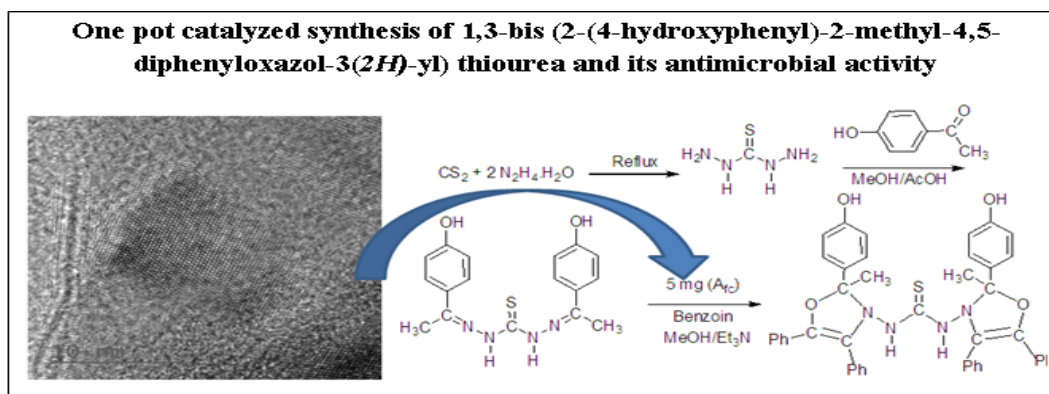
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ABSTRACT

Aloevera-Fe⁰-Nps-Silica nanohybrid (A_{fc}) catalyzed synthesis and antimicrobial activity of 1,3-bis (2-(4-hydroxyphenyl)-2-methyl-4,5-diphenyloxazol-3(2H)-yl) thiourea is being reported in the present communication. The catalyst was designed by integrating zerovalent FeNps (ZVI Nps) with Aloevera polysaccharide (AVP)-silica hybrid hydrogel. The synthesis of this new oxazole derivative (TO_x) was performed in a single step using three components (thiocarbohydrazide, 4-hydroxy acetophenone, and benzoin) both through catalyzed and uncatalyzed routes. The catalyzed reaction led to 99.5 % product yield as compared to 49 % yield of the uncatalyzed reaction. The structure of TO_x was established using C H N analysis, FTIR, and ¹H NMR spectroscopy. The catalyst was easily recycled for the synthesis. TO_x exhibited fairly good antimicrobial activity against different strains of pathogenic bacteria and fungi. The minimum inhibitory concentration (MIC), minimum bactericidal concentration (MBC) and minimum fungicidal concentration (MFC) of TO_x were determined using positive and negative controls.

Graphical Abstract



Keywords: Aloevera-Fe⁰-Nps-Silica nanohybrid, heterogeneous catalyst, oxazole nucleus, thiourea derivative, antimicrobial activity.