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Ultrasound-assisted synthesis of 3,4-dihydropyrimidine-2(1*H*)-ones catalyzed by nanocomposites: An efficient and green approach

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ZnO NPs, CuO NPs, and ZnO-CuO NCs have been synthesized from aqueous extract of *Azadirachta indica* (neem plant) leaves extract by co-precipitation method in aqueous medium, under ultrasound irradiation. The traditional medicinal leaf extract of Neem (*Azadirachta indica*) in combination with ultrasound irradiation result in the formation of different morphologies of ZnO NPs, CuO NPs, and ZnO-CuO NCs. The significant antibacterial activity study of synthesized NPs has been carried out against two bacterial strains namely *E. coli* and *S. aureus* and it is shown that they have good ability to resist growth of bacteria. Among the synthesized nanoparticles bimetallic nanoparticles have drawn interest to a greater extent than monometallic nanoparticles. The enhancement could be due to the synergy between ZnO and CuO NPs. Hence, ZnO-CuO NCs used to productive synthesis of dihydropyrimidones derivatives under solvent-free technique is described. The environmental friendliness and reusability of the catalyst with steady activity, short reaction time, simple filtration process for separation of catalyst and simplified product isolation make this protocol attractive in organic synthesis.

Keywords: Nanocatalyst, Ultrasound irradiation, Multicomponent reaction, Antibacterial activity, Solvent-free technique, Green synthesis