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Title:	Synthesis, characterization, and photocatalytic activity of ZnO nanoparticles using water extract of waste coconut husk
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Abstract:	The present work reports the use of natural alkaline extract from coconut husk ash as a precipitating agent for metal oxide nanoparticles synthesis. The abundance of K2O and K2CO3 in it makes the extract highly basic and could be the alternative source of basic media in the laboratory. In this study, highly photoactive zinc oxide nanoparticles have been synthesized using water extract of waste coconut husk ash in a green approach which is considered as replacement of homogeneous base like NaOH and KOH. The formation of zinc oxide nanoparticles at different pH of the solution of coconut husk ash was confirmed through powder XRD, BET, SEM–EDX, UV–Vis, FTIR, and photoluminescence spectroscopy. The photocatalytic performance of the samples was evaluated through the degradation of methylene blue (MB) and methyl orange (MO) under solar irradiation which undergo degradation around 97% and 68% within 120 min, respectively. The high photocatalytic activity and rate constant could be attributed to the large surface area due to small particle size that could provide quicker photon absorption and reduction of charge carrier recombination. This current work introduces a new method to reduce energy consumption for the synthesis of highly photoactive low-cost zinc oxide nanoparticles.
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