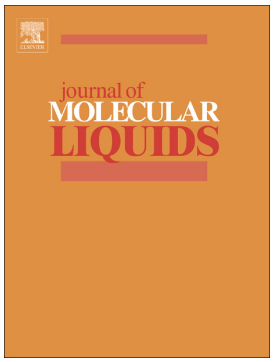

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Evaluating the Efficiency of Nano-Sized Cu Doped TiO2/ZnO Photocatalyst under Visible Light Irradiation

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Abstract

A visible light responsive photocatalyst, nano-sized copper doped TiO_2/ZnO, was synthesized by sol gel method. It was characterized in terms of thermal stability, crystalline phase, crystal size, morphology, surface area, UV-Vis DRS and band gap. The results showed that the synergistic effect of copper ions considerably narrowed the band gap of the synthesised photocatalyst compared to TiO_2/ZnO. Its photoactivity was then evaluated by measuring degradation efficiency of methyl orange (MO) and methylene blue (MB) in terms of colour, COD and TOC removal. The synergistic or antagonistic effects of different combinations of dye and catalyst concentrations, pH, intensity of light irradiation and reaction time on photoactivity of Cu-TiO_2/ZnO were also investigated. The highest photoactivity achieved was 85.45% of colour, 70.56% of COD and 48.70% of TOC removal for MO and 73.20% of colour, 59.92% of COD and 38.77% of TOC removal for MB under optimal conditions.