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Title:	Effect of transition metal ion (Cr3+, Mn2+ and Cu2+) doping on the photocatalytic properties of ZnWO4 nanoparticles
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Abstract:	In this work, we report the effect of transition metal ion doping on the photocatalytic properties of ZnWO4 nanoparticles. Undoped and transition metal (Cr3+, Mn2+ and Cu2+) doped ZnWO4 nanoparticles have been synthesized sonochemically and have been characterized using powder X-ray diffraction (XRD), transmission electron microscopy (TEM) and energy dispersive spectroscopy (EDS). Band gap has been estimated using UV–vis diffuse reflectance spectroscopy (DRS) which shows a red shift with doping which could be attributed to doping effects and lattice variation. The photocatalytic efficiency of the samples was tested for Methylene blue (MB) degradation under simulated solar light (150 W Xe arc lamp) which showed improvement with doping. The best results were obtained for ZnWO4:Cr3+(2 mol%) and ZnWO4:Cu2+(2 mol%) samples which was a result of proper band gap tuning and enhanced separation of the photogenerated electron/hole pairs leading to effective degradation of the MB dye solution. The photocatalytic mechanism has been elucidated and it could be inferred that photogenerated holes and hydroxide radicals play a major role in the photocatalysis
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