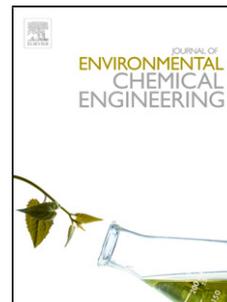


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## Synthesis of Nano-ZnO by Wire Explosion process and its photocatalytic Activity

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### Abstract

Zinc oxide (ZnO) nanoparticles were produced by wire explosion process and characterised through X-ray diffraction (XRD) studies and by TEM studies. The particle size analysis indicates that they follow log-normal distribution and the mean size of the ZnO nanoparticles formed is about 44 nm. Optical band gap of ZnO is found to be 3.21 eV by UV-Vis diffuse reflectance spectroscopy (DRS). The synthesized ZnO nano particles were used as photo catalyst for degradation of methylene blue (MB) in aqueous solution. 100 mg/L of nano ZnO particles was found as the optimum quantity for UV photo degradation of 10 mg/L MB. ZnO nanoparticles were verified for its reusability. The results of the study are compared with commercial ZnO nanoparticle and with Degussa P-25 TiO<sub>2</sub>. LC-MS studies were carried out to identify the intermediates and degradation pathway.

*Keywords:* ZnO; nanoparticles; Wire Explosion; water treatment; Methylene Blue; Degradation mechanism

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