



## Removal of Rhodamine B Dye from Aqueous Solution by Advanced Oxidation Process using ZnO Nanoparticles

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**Abstract:** Electrocatalytic oxidation of Rhodamine B (RhB) dye from aqueous solution was investigated with RuO<sub>2</sub>/IrO<sub>2</sub>/TaO<sub>2</sub> coated titanium electrodes using zinc oxide (ZnO) nano particles. ZnO nanoparticles were synthesized by chemical method; morphology and structure of the synthesized nanoparticles were characterized by Scanning Electron Microscope (SEM), X-ray diffraction (XRD). The electrical, optical and structural properties were studied. The parameters that influence the efficiency of the treatment were investigated, including dye initial pH, applied current density, concentration of dye, concentration of supporting electrolyte, stirrer speed and treatment time. The effective decolourization achieved in the presence of NaCl (0.05 M) as conductive electrolyte. Under the optimal conditions, the decolourization efficiency reached 91.5 per cent in 60 minutes of electrolysis. The pH was important parameter for the electrocatalytic oxidation process, the maximum efficiency of colour removal was achieved at pH 5.0. The degradation products of Rhodamine B were confirmed by GC-MS.

**Keywords:** Advanced oxidation, Colour removal, Rhodamine B dye, RuO<sub>2</sub>/IrO<sub>2</sub>/TaO<sub>2</sub> coated Titanium anodes

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