

**RU DOPED ANATASE TITANIUM DIOXIDE AND
ITS PHOTOCATALYTIC ACTIVITY OF RHODAMINE B**

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ABSTRACT

RU DOPED ANATASE TITANIUM DIOXIDE AND ITS PHOTOCATALYTIC DEGRADATION OF RHODAMINE B

Pure and ruthenium-doped titanium dioxide (TiO_2) nanoparticles powder were prepared in this study via liquid deposition method. The TiO_2 in this study was synthesised from the potassium titanyl phosphate powder and boric acid as fluoride scavenger. The ruthenium element was introduced to the pure TiO_2 at different concentrations. The doped concentrations of Ru were varying at 0.1 M, 0.5 M, 0.025 M, 0.00125 M and 0.00625 M respectively. The samples were characterized using X-ray diffraction (XRD), Field Emission Scanning Electron (FESEM) and UV-Vis spectrophotometer. XRD analysis shows that the TiO_2 nanoparticles prepared has anatase structure with a dominant high energy (101) basal plane. The EDX analysis confirms the presence of Ru element in the TiO_2 nanoparticle. FESEM showed the morphological analysis of the sample. The band gaps of the samples lie in the theoretical value obtained from the absorbance using UV-Vis spectrophotometer. Photocatalytic properties of the samples were examined using degradation of Rhodamine B. It was found that pure TiO_2 shows poor photocatalytic performance and Ru-doped TiO_2 shows an enhancement towards photocatalytic performance. 0.025 M Ru was the optimum concentration while the concentration above this dopant yields poor result of photocatalytic degradation.

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