

EXPERIMENTAL STUDY TOWARDS FABRICATION OF SPRAY-DRIED PHOTOCATALYTIC TITANIUM DIOXIDE FILMS FOR WATER TREATMENT

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ABSTRACT

Doped TiO₂ were milled and then processed into powder using a spray dryer. The powder was dried overnight and then heat treated (calcined) at different temperatures for 4 hours. Characterization of doped TiO₂ was done using Field Emission Scanning Electron Microscope for size and morphology determination; X-Ray Diffractometer for crystallinity analysis; and FT Raman Spectrometer for Raman spectroscopic analysis. As calcination temperature went up, rutile phase increased with increased crystallite size in commercial (Degussa P25) TiO₂ but it was not observed in the doped sample. The crystallite size and diffraction peak intensity of the doped (anatase) TiO₂ increased as calcination temperature went up. Diffraction peaks for talc disappeared after milling (i.e grinding process). Two new RAMAN bands started to emerge at 1926 and 1498 cm⁻¹ starting at temperature 750°C and showed significant peaks at 950°C due to presence of talc or its constituents in the doped sample. This requires further study and investigation.

Keywords: Water Treatment; Photo Catalys; Titanium Dioxide; Spray Drying; Grinding Process;

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