

Report of the Minor Research Project File No. 47-498/08(WRO)

Title of the Project : Environmental benign photodegradation of dyes using Nanotechnology

The nano titanium dioxide (TiO_2) was prepared by sol-gel technique and was characterised by XRD and TEM images. It was found that the size of the nano TiO_2 particles vary from 18 to 60 nm and also of anatase type TiO_2 . This nano TiO_2 was coated in the form of a thin layer on the different substrates such as mild steel, stainless steel and quartz plates. This TiO_2 coated plates were hanged in the photo-reactor made up of hard glass designed by us which is having an outer tube for the circulation of water to maintain the temperature and an inner tube for the circulation of dye solution. There was also a provision for the UV light which is used for the activation of Nano TiO_2 coated on the plates. Thus the photodegradation of Acid Orange 25 and Acid Orange 56 dyes were studied by using different parameters such as effect of concentration of dye solution, effect of substrate, effect of nano TiO_2 catalyst loading, effect of time of initial activation and effect of temperature.

This study was then further modified to study the photodegradation of acid azo dyes by using nanocomposites made up of nano TiO_2 and carbon nanotubes CNTs and a comparative study was carried out.

We have presented a poster for this study in National conference on Advanced Materials in Industries, 2012.

The part of this study and the extension of the research work was then published as a book entitled, 'Nanotechnology for waste water treatment by Lap Lambert Academic Publishing, Germany with ISBN : 978-3-659-22131-6 in 2012.

We are really thankful to the UGC(WRO) for providing the assistance to initiate the basic study in the preparation of a photo catalyst Nano Titanium dioxide TiO_2 and its application in the degradation of dyes and other toxic materials.

Status of the Minor Research Project : Completed

Signature of the Principal Investigator :

(Dr. Ramesh S. Yamgar)