Abstract of thesis

In the present work, the possibility of using metal oxide nanoparticles in dye wastewater treatment has been explored. The nano-sized metal oxides such as MgO, Al₂O₃, ZnO and TiO₂ were synthesized via different techniques and were employed for the removal/degradation of textile dyes. Textile dyes from reactive, vat and acid dye families were chosen as model organic pollutants in the present study. Properties like high surface area and wide band gap exhibited by metal oxides at the nanoscale level were exploited to achieve dye removal from its aqueous solution. Al₂O₃ and MgO nanoparticles were used as adsorbents for the removal of textile dyes while ZnO and TiO₂ nanoparticles have been employed as photocatalysts for the degradation of these dyes.

Key words: metal oxide nanoparticles, textile dyes, adsorbents, photocatalyst.