



Efficient photocatalytic degradation of toxic dyes using nanostructured TiO₂/polyaniline nanocomposite

Lalitha Gnanasekaran^a, R. Hemamalini^{a,*}, Mu Naushad^{b,*}

^aDepartment of Physics, Queen Mary's College, Chennai 600 004, India, email: hemaphy.qmc@gmail.com (R. Hemamalini)

^bDepartment of Chemistry, College of Science, Building #5, King Saud University, Riyadh, Saudi Arabia, email: shad81@rediffmail.com (M. Naushad)

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ABSTRACT

In this study, the synergistic effect between polyaniline and TiO₂ nanoparticles make favorable accomplishment of aqueous methyl orange (MO) and methylene blue (MB) dyes. Before the degradation reaction, two-step methods were executed to prepare nanocomposite (TiO₂/polyaniline) systems. Apart from synthesis, characteristics of the materials were perceived via x-ray diffraction, transmission electron microscopy, FOURIER transform infra red and UV-Vis techniques. The characteristic outcomes described the presence of polyaniline which suggestively impacts the size and crystallinity of TiO₂ and additionally, initiate $\pi-\pi^*$ transition under visible light illumination. The $\pi-\pi^*$ transition was excited to generate more electrons and holes in the nanocomposites and it helps to achieve visible light degradation of MO and MB.

Keywords: Metal oxide; Polyaniline; Conducting polymer; Methyl orange; Photocatalyst

* Corresponding author.