

Synthesis and Application of Nanocomposite for Wastewater Treatment: A Critical Review

Appeals of Nanocomposites have acquired scientist's profound attentiveness for studies in wastewater treatment. The major challenge of treatment with conventional methods like coagulation, flocculation, chemical addition, and filtration have been found less effective, so there is a need to synthesize photocatalyst, which has high efficiency. Quite a few Nanocomposites having core-shell structure has been synthesized; Size, structure, morphology, surface charge, thermal stability and magnetic properties have been investigated by various characterization techniques. Morphology of Nanocomposites was characterized using high-resolution TEM, X-ray photon spectroscopy, FTIR, TG analysis, UV-Visible. In general Nanocomposites like C-doped Fe₃O₄@TiO₂ and CoFe₂O₄ etc. Have magnetic properties, which make them easily recyclable and recoverable. The photocatalytic activities were evaluated under photodegradation of methyl orange and organic pollutants under natural sunlight. The Nanocomposites have shown high efficiency for the degradation of wastewater pollutants comparatively with bare nanoparticles. Innovative techniques were used for surface modification and improving photocatalytic efficiency. Nanocomposites perform photocatalytic action in different consecutive photocatalytic reactions, which have removed heavy metals, organic pollutants, Oils, Humic acid, dyes, inorganic ions, and bacteria to a great extent with their specific binding adsorption and electrode action. Recovery rate and efficiency can also be adjusted by applying a magnetic field due to absorbance ability enhancement.

Keywords: Nanocomposites, Photocatalysis, Waste Water Treatment.

Dolly Singh

*National Institute of Technology,
India*

ds.20p20062@msc.nitdgp.ac.in