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Name of the Scholar: Shayista Gaffar

Name of the Supervisor: Dr. Amit Kumar

Name of the Department: Chemistry

Topic of the research: Synthesis, characterization and photocatalytic applications of conducting polymer/ferrite nanohybrids

Findings

The thesis entitled "**Synthesis, characterization and photocatalytic applications of conducting polymer/ferrite nanohybrids"** consists of six chapters. The thesis describes the synthesis of various metal ferrites and their nanohybrids with various conducting polymers utilizing environmentally affable substance and procedures. The prepared nanohybrids were employed for the photocatalytic degradation of various pharmaceuticals, dyes, inorganic pollutants, and other emerging contaminants. Various techniques including X-ray diffraction (XRD), Ultraviolet Diffuse Reflectance Spectroscopy (UV-DRS),Fourier Transform infrared spectroscopy (FTIR), Brunauer–Emmett–Teller (BET) analysis, Scanning electron microscopy (SEM), Energy dispersive X-ray spectroscopy (EDX), and X-ray photoelectron spectroscopy (XPS). Mechanistic insights were explored through radical scavenging experiments, while kinetic studies were performed using Langmuir-Hinshelwood and pseudo-first-order models. The study demonstrated that conducting polymer/ferrite nanohybrids exhibit enhanced photocatalytic performance due to improved charge separation, extended light absorption, and high surface area, making them promising candidates for wastewater remediation and environmental applications.