

## Abstract

The focus of the present study is to devise facile methods for the detection of Explosives by using freshly prepared Nanocomposites of Zinc oxide. For the present Zinc Oxide Nanocomposite was prepared by using co-precipitation methodology and to further exploit the Photocatalytic sensing properties of prepared nanocomposites. For the sake of studies, Nickel doped bimetallic Nanocomposites of Zinc oxide was prepared in different concentration. Nickel-doped Zinc Oxide nanocomposites were prepared with 1%, 3%, 5%, and 7% doping of Nickel. Particle size was established through X-rays diffraction and subsequently produced fingerprint confirmed the particle size in nanocomposites. To check the catalytic efficiency of Nanocomposites, a solution of Methyl Green, 2-Nitrophenol & 4-Nitrophenol with different concentrations was used. The prepared solution of compounds was treated with prepared nanocomposites. The photocatalytic properties of nanocomposites contributed to the degradation of Methyl Green and help to reduce the 2-Nitro-phenol & 4-Nitrophenol to 2-Aminophenol and 4-Aminophenol. UV-Visible spectra helped to detect the rate of degradation and reduction of Nitrophenols. The result helped to identify that prepared composite effectively degraded the Methyl Green, and reduced Nitrophenols. The photocatalytic property of prepared Nanocomposites is attributed to greater absorptivity and large surface area due to surface defects. The results show that prepared Nanocomposites can be used to degrade the toxic industrial effluents, Nitrate containing explosives, and elimination of explosives.