Abstract:

PVA based Ni-O nano-composites were synthesized by sol gel method in which nickel sulphate salt and NaOH as casting agent. PVA based nano- composites were characterized by different techniques as Fourier transform infrared spectroscopy (FTIR), UV-Vis spectroscopy (UV-Vis), X-Ray diffraction spectroscopy (XRD), Scanning Electron microscopy (SEM), Energy dispersive X-ray spectroscopy (EDX) and Raman spectroscopy. UV-Vis spectrum shows PVA/ Ni-O nano- composites exhibit absorption peak at 390nm. EDX results confirmed highest Ni mass percentage. And SEM results illustrated that nanocomposite film has polymeric structure due to PVA and Ni-O nanoparticles are distributed equally in PVA matrix. FTIR analysis gave functional group confirmation containing vibrational peak O-H group at 3450 cm^{-1}. Similarly, Ni-O showed bending vibration at 663cm^{-1}.PVA based Ni-O nanocomposites were used for photocatalytic degradation of methylene blue. Methylene blue was degraded under visible light in 60 minutes. After 10 minutes interval, sample from solution was taken and analyzed under UV-Vis spectroscopy. Results showed 86% dye degradation in 60 minutes by PVA based Ni-O nanocomposites. Dye degradation results confirmed that nanocomposites showed more ability to degrade dyes with PVA.