Abstract

Transition metal oxide based photocatalysts have earned great attention because they have the ability to remove organic pollutants from waste water under natural sunlight. The chemical approach was adopted to form nickel manganese oxide ($NiMn_2O_4$) and $NiMn_2O_4$ anchored with multi-walled carbon nanotubes ($NiMn_2O_4$/MWCNT's). X-ray diffraction confirm the preparation of $NiMn_2O_4$ and $NiMn_2O_4$/MWCNT's. UV-Vis DRS study of $NiMn_2O_4$ anchored with MWCNT's manifest lessening the bandgap energy from 2.8 eV to 2.5 eV. Anchoring of MWCNT's with $NiMn_2O_4$ nanocomposite improves photocatalytic activity. It has degraded methylene blue dye upto 98% in 45 minutes under solar light irradiation. This improved photocatalytic potential of MWCNT's anchored composite as compared to simple $NiMn_2O_4$ composite is because of the superior electron storing capacity of MWCNT's. MWCNT's also possess a broad surface area comprising extra reactive sites for redox reactions, which improves conductivity and limits the probability of hole-electron recombination.