Contribution ID: **29** Type: **Research Paper**

A Study of the Morphology of SynthesizedZnO Nanoparticles and their Application in Photodegradation of Dyes

Environmental pollution by toxic organic contaminants is a global menace so declining water quality has become a global issue. Organic dyes produce toxic aromatic amines that are carcinogenic to human beings and harmful to the environment yet they are non-biodegradable. Nanotechnology is a promising field in waste water treatment. The aim of this study thus was to assess the use of synthesized ZnO nanoparticles in photo degradation of dyes. The basis of ZnO/UV photo-catalytic process is the semi-conduct optical stimulation of ZnO as a result of electromagnetic ray absorption. Precipitation technique was used to synthesize ZnO nanoparticles. By varying experimental conditions, two samples L1 and L2were synthesizedand characterized using Power X-ray Diffraction (PXRD), Fourier Transform Infra-Red (FTIR), Scanning Electron Microscopy (SEM) and Energy Dispersive X-ray Spectroscopy (EDX) methods of analysis. The PXRD results showed diffraction peaks which were indexed to ZnO reference as per JCPIDS file 80-0075. The size of ZnO nanoparticles was found to be 26 nm. FTIR spectra showed a broad band at around 430 cm-1 with shoulder shape, characteristics of Zn-O bond. The images obtained by SEM showed rod shaped clusters of nanoparticleswere distributed well within a range of 100 nm which is a favourable property to exhibit better photo catalytic activity. The EDX results showed elemental composition of ZnO nanoparticles and showed 54% Zn, 44.07% O and 1.93% Mn impurities for L1 and 55.34% Zn, 42.3% O and 2.37%Mn impurities for L2. on the extent of photodegradation has also been investigated. The results showed that percentage removal of the dye increases with increase in contact time and amount of photocatalyst, it decreases with increase in initial dye concentration. The results revealed that dyes could be removed by semiconducting nanomaterials assisted by photocatalytic degradation.

Primary author: Ms CHEBOR, lucy

Session Classification: Issues and Challenges in Basic Education Act (2012)

Track Classification: Issues and Challenges in Basic Education Act (2012)