**Abstract**

The copper oxide (CuO) nanoparticles (NPs) were prepared simply by Hydrothermal process using various concentration of the surfactant of cetyltrimethyl ammonium bromide (CTAB –0.05 and 0.1 M) and their by structural, optical, dc electrical and diode properties have been analyzed. From the XRD analysis, the crystallite size of the CTAB assisted CuO NPs was reduced. The CTAB caused an increase in the optical absorbance and band gap of the NPs. The morphological changes in the sponge, plate like structure under the strong influence of the surfactant were observed from SEM analysis. The FT-IR spectrum confirmed that the presence of Cu and O elements. The dc electrical analysis revealed that conductivity increased while using CTAB. The electrical parameters of ideality factor (n), barrier height (ФB), series resistance (Rs) and interface properties for the n-Si/p-CuO diodes have been analyzed by the I-V method.