**Abstract**

 Metal-oxide-semiconductors have been widely used for the optoelectronic applications like smart windows, solar cells, light emitting diodes and flat panel displays. Among all the metal oxides, copper oxide nanomaterials have a great attention due to its unique properties. It is mostly used in recent research works because of its low cost, rich availability and used in latent applications like antibacterial activities. Aluminium nanoparticles are a good conductor and it enhances the conductivity. Hence an attempt is made to synthesize CuO and Al doped CuO nanoparticles by hydrothermal method. The prepared samples are characterized by XRD, FT-IR, SEM, UV-Vis and PL analysis.The crystallite structures of CuO and Al doped CuO nanoparticles are identified by XRD analysis. The Fourier transform Infrared spectroscopy is used to determine the functional groups present in the prepared nanoparticles. UV-Vis Spectral analysis is performed to determine the band gap energy of the synthesized nanoparticles. PL spectral studies are used to study the optical properties of the nanoparticles. The morphology of the samples is determined by using scanning electron microscopy analysis. The impact of aluminium on structural, optical and morphological properties is investigated. The antibacterial activities of prepared CuO and Al doped CuO nanoparticles are probed.