**Abstract**

The different technological applications of metal oxide thin films are mostly ruled by their properties [1]. Among the different metal oxides,thin films of CuO (Cuprous oxide) have attracted much attention as promising materials for many industrial applications [2-4]. CuO, which has a monoclinic crystal structure, is an important p-type semiconductor with an optical band gap ranging from 1.2 to 1.6 eV and a high absorption coefficient. It is effectively employed in catalysts, gas sensors, solar cells, lithium ion batteries, and superconductors. The structural morphology and particle size play important roles in determining the physicochemical properties of CuO. The present study deals with the preparation of pure and CTAB coated CuO nanomaterials by using the hydrothermal route and the study of their structural, physical, and optical properties.

The XRD patterns of both pure and CTAB coated CuO nanomaterials are found to exhibit a well crystallized monoclinic structure. The SEM image gives direct information about the size and typical morphologies of the pure and CTAB coated CuO. The optical band gap values of the pure and CTAB CuO nanoparticles are estimated from the UV studies. Fourier transform infrared (FTIR) spectra confirm the chemical structure and also help to identify the major functional groups existing in the pure and CTAB CuO particles. The CuO samples prepared with CTAB show a better performance compared to the pure CuO samples