
Abstract

Nanoparticles of cerium-doped manganese oxide were prepared with the solution combustion technique, where various concentrations of Ce (2, 4, 6, and 8%) were considered to dope into Mn_xO_y lattice. Phase identification, presence of functional groups, optical properties, and surface morphology of Ce-doped Mn_xO_y were evaluated using X-ray diffraction, Fourier-transform infrared spectroscopy (FTIR), UV-vis analyses, and scanning electron microscope (SEM), respectively. During sintering at 700 °C, MnO_2 and Mn_5O_8 were developed and transformed to BCC Mn_2O_3 during annealing at 900 °C. The crystallinity of the specimens was increased with an increase in the Ce-concentration. SEM images revealed the cloudy morphology of prepared nanoparticles, also particle size increased with Ce-concentration. FTIR spectra confirmed the presence of various functional groups and molecules such as Mn-O and O-Mn-O, in the prepared specimens. UV-vis spectroscopy depicted a slight redshift in the absorption window. Samples were tested for antimicrobial activity against gram-positive and gram-negative bacteria and compared its efficiency with standard antibiotic *Penicillin*.