

Abstract

Nanoparticles of samarium-doped manganese oxide were prepared with the solution combustion method, where concentration of Samarium (0.75%) was considered to dope into Mn_xO_y (99.25%) lattice. Phase identification, presence of functional groups, and optical properties of Sm-doped Mn_xO_y were evaluated using X-ray diffraction, Fourier-transform infrared spectroscopy (FTIR), UV-vis analyses, respectively. During heating at 350°C , MnO_2 and MnO , MnO_2 (IV) were developed and then reheating at 350°C . The crystallinity of the specimens was increased / decreased with heating and reheating. FTIR spectra confirmed the presence of various functional groups and molecules such as C=C, N=C=S, Mn-O and C-OH, in the prepared specimens. The absorption window showed a modest redshift as seen by UV-vis spectroscopy. Gram-negative bacteria (*E. coli*) were examined for antimicrobial activity for the samples, and the results were compared to the effectiveness of the standard antibiotic *Penicillin*.