N Rajamanickam et al., J Material Sci Eng 2014, 3:3
http://dx.doi.org/10.4172/2169-0022.S1.016

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference and Exhibition on
Materials Science & Engineering
October 06-08, 2014 Hilton San Antonio Airport, USA

Efficiency of perovskite nano $BaSnO_3$ based dye-sensitized solar cells

N Rajamanickam, S Rajashabala and **K Ramachandran**
Madurai Kamaraj University, India.

Ternary oxides are potential candidates as electron-transporting materials as their electronic/optical properties can be easily controlled by manipulating the composition and/or by doping and so can be uses in dye-sensitized solar cells (DSSCs). Here perovskite $BaSnO_3$ (BSO) nanoparticles and the effects of different dyes on the photovoltaic properties of BSO-based DSSCs are investigated. BSO nanoparticles of average size is 43 nm were prepared by the co-precipitation method. Structural characterization by XRD revealed the presence of perovskite phased BSO without any secondary phase and the calculated lattice parameters agreed with the JCPDS data (89-2488). The surface morphology and the chemical composition of BSO nanomaterials were investigated by SEM with EDS analysis. The optical absorption and emission spectra of the synthesized samples were examined with UV-vis and photoluminescence spectroscopy, respectively. The band gap of the BSO is 3.17 eV, which is higher than that of earlier works (3.1 eV). FTIR analysis was used to determine the vibrational modes of the synthesized samples. The magnetic and dielectric properties were studied for various fields and temperatures and only a feeble signature of multiferroic properties obtained at room temperature. Finally, I-V measurements were carried out on the fabricated solar cell and the solar conversion efficiency was found to be is >4.2% and the result are compared with earlier reports.

nrajamku@gmail.com