Abstract:

We report investigation of effect of conduction band edge on the dye injection and transport by preparation of (Ti,Sn)O2 solid mixtures in ratios of 80:20 and 90:10 as possible applications in dye sensitized solar cells. SEM micrographs showed highly porous with nanometer sized particles of around 6 - 10μm diameter. X-ray diffraction patterns showed strong TiO2 anatase peaks with crystal orientation directions (101) being the strongest in both the solid mixtures and in pure TiO2. XPS studies have shown an apparent chemical shift for Ti 2p and O1s core level spectra with an energy difference between the unmodified and the solid mixture being 0.65eV. Initial I-V studies have shown high Voc but low short circuit photocurrent, showing a possible unfavorable band edge shift between the semiconductor and the dye LUMO level.