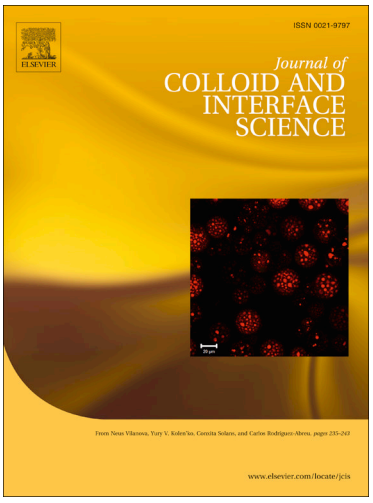

SILAR controlled CdSe nanoparticles sensitized ZnO nanorods photoanode for solar cell application: Electrolyte effect

Pratibha R. Nikam, Prashant K. Baviskar, Sutripto Majumder, Jaydeep V. Sali, Babasaheb R. Sankapals

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SILAR controlled CdSe nanoparticles sensitized ZnO nanorods photoanode for solar cell application: Electrolyte effect

Pratibha R. Nikam[a], Prashant K. Baviskar[b*], Sutripto Majumder[c,d], Jaydeep V. Sali[a], Babasaheb R. Sankapal[d*]

[a]Department of Physics, School of Physical Sciences, North Maharashtra University, Jalgaon-425001 (M.S.) India.

[b]Advanced Physics Laboratory, Department of Physics, Savitribai Phule Pune University, Pune-411007, India

[c]Department of Physics, National Institute of Technology, Raipur. G.E. Road, Raipur, Chattisgarh-492010, India

[d]Nano Materials and Device Laboratory, Department of Physics, Visvesvaraya National Institute of Technology, South Ambazari Road, Nagpur- 440010, India.

Abstract

Controlled growth of different sizes of cadmium selenide (CdSe) nanoparticles over well aligned ZnO nanorods have been performed using successive ionic layer adsorption and reaction (SILAR) technique at room temperature (27 ^{o}C) in order to form nano heterostructure solar cells. Deposition of compact layer of zinc oxide (ZnO) by SILAR technique on fluorine doped tin oxide (FTO) coated glass substrate followed by growth of vertically aligned ZnO nanorods array using chemical bath deposition (CBD) at low temperature (<100 ^{o}C). Different characterization techniques viz. X-ray diffractometer, UV-Vis spectrophotometer, field emission scanning electron microscopy and X-ray photoelectron spectroscopy have been used to know the structural, optical, morphological and compositional properties of synthesized nano heterostructure. The photovoltaic performance of the cells with variation in SILAR cycles for CdSe and with use of different electrolytes have been recorded as J-V characteristics and the maximum conversion efficiency of 0.63% have been attained with ferro/ferri cyanide electrolyte for 12 cycles CdSe coating over 1-D ZnO nanorods.

Keywords: Wet chemistry; 1-D ZnO nanorods; SILAR; CdSe; Electrolyte effect; Nano heterostructure solar cell; EIS.

*Corresponding authors: pkbaviskar@physics.unipune.ac.in (PKB); brsankapal@phy.vnit.ac.in (BRS)