

Department of Materials Science

Novel Composite Oxides by Combinatorial Material Synthesis for Next Generation All-Oxide-Photovoltaics

MEON



FACULDADE DE
CIÊNCIAS E TECNOLOGIA
UNIVERSIDADE NOVA DE LISBOA



Shrabani Panigrahi

Post-doctoral research scholar

Holder of Ph.D degree from University of Calcutta, India, 2014.

Currently a post-doctoral researcher under the supervision of Prof. Elvira Fortunato

Objectives

- Development of doped Cu_2O film using spray pyrolysis technique. Optimization of the precursors for deposition and the substrate temperature.
- Deposition of n-type materials by using low cost method.
- Development of photovoltaics with high efficiency using oxide based materials.
- Characterizations of structural and optoelectrical properties of oxide based PV.

Methodology

Co Doped Cu_2O film preparation:

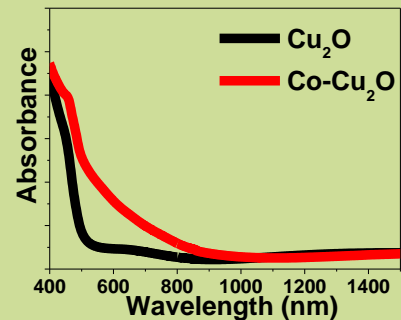
By using spray pyrolysis technique Co doped Cu_2O thin film have been prepared using copper acetate monohydrate and cobalt chloride salts keeping the substrate temperature at 300-320°C.

ZnO film preparation:

By using sol-gel technique ZnO thin film are prepared.

Characterizations:

After the preparation of these two types of film all the characterizations are performed and the efficiency of solar cell have been calculated from the results.



Expected Results

From the literature we have observed that the efficiency of the ZnO- Cu_2O based solar cell is about 3-4%. As our results indicate that the absorbance power in case of Co doped Cu_2O material is much higher in the visible region than that of undoped Cu_2O material. So we can expect that the efficiency of photovoltaics by using doped material will be higher than that of the reported results.