

### **Quasi-Solid State SnO<sub>2</sub>/CaCO<sub>3</sub> Solar Cells Sensitized with Indoline D-358 Dye**

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Dye sensitized solar cells (DSSCs) have drawn the attention of researchers due to simplicity of preparation and low cost compared to conventional solar cells. Even though the liquid electrolyte DSSCs shows the highest efficiencies in their class, there are draw backs in these systems such as solvent evaporation and sealing problems. As such, there have been attempts to replace the liquid electrolyte by a hole collector or a quasi-solid electrolyte in order to overcome these problems.

In present study, quasi-solid dye-sensitized solar cells were prepared using CaCO<sub>3</sub>-coated SnO<sub>2</sub> sensitized with indoline dye D358. The quasi electrolyte was prepared using polyacrylonitrile polymer with ethylene carbonate and propylene carbonate as plasticizers. The CaCO<sub>3</sub> insulating layer inhibits the recombination and increases the open circuit voltage  $V_{oc}$  of the cell from 330 mV to 700 mV while not affecting the short-circuit current  $I_{sc}$  significantly. For this system we have achieved a best photo conversion efficiency of 4.0 % for a molar ratio of SnO<sub>2</sub> : CaCO<sub>3</sub> = 1 : 0.02 under 1.5 AM conditions.