**Link:** <https://solar-power-tech.com/e-posters/dsc_eposter_06/>

**Abstract**

Poly(3,4-propylenedioxythiophene (PEDOT) counter electrodes are considered to be one of the most promising alternatives to expensive Pt-based counter electrodes in Dye Sensitized Solar cell (DSSC). In the present study, we prepared PEDOT counter electrodes with various thicknesses through scalable electropolymerization technique using a nontoxic mixture of sodium dodecyl sulfate (SDC) in water medium, which provides the opportunity for scale up and commercialization.1,2 The time scale for electropolymerization was varied systematically to tune the thickness and uniformity of PEDOT film. The PEDOT films and their interaction with conventional iodide and triodide (I-/I3-) were studied using various electrical and optical characterization techniques. The catalytic activity of porous PEDOT films were found to be decreasing with an increase in thickness. DSSCs fabricated using PEDOT counter electrodes having lower thickness of 33 nm (deposited with 5 seconds polymerization time) showed superior power conversion efficiency of 10.39% followed by PEDOT counter electrodes having 65 nm and 120 nm thickness deposited with polymerization time of 10 s and 15 s delivering power conversion efficiency of 8.11% and 7.45% respectively. Electrochemical Impedance Spectroscopy (EIS) was used to investigate the role of variation in PEDOT thickness with various charge transfer processes at the electrolyte/counter electrode interface influencing PV performance