

Optimization of dye adsorption time for DSSC

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Dye-Sensitized Solar Cell(DSSC) is advantageous in the points that its process is simple compared to Silicon Solar Cell so that makes it economical, and it also has long lifetime and high transparency. Recently, several companies are planning to commercialize DSSC and in this respect, it also becomes important to study for higher efficiency in process as well as higher photocurrent efficiency of cell. The process of DSSC is composed of three parts, briefly: 1. Deposition of semiconductor like TiO₂ on working electrode. 2. Dye adsorption and manufacture of counter electrode. 3. Assembly of cell. Between the parts, dye adsorption step requires the longest time period making it necessary to find the optimized adsorption time for higher efficiency in process. Thus, in this study, cell efficiency and amount of dye adsorption were analyzed per each time interval and the optimized time was found. The cell efficiency, short circuit current(J_{SC}), and open circuit voltage(V_{OC}) were analyzed using Solar Simulator AM 1.5G filter and Potentiostat, and the amount of dye adsorption was studied with UV-vis Spectroscopy.