**Link:** <https://solar-power-tech.com/e-posters/dsc_eposter_14/>

**Abstract**

Recently, two-dimensional transitional metal carbides (MXene) having unique optoelectronic properties have gained worldwide attention owing to their easily modified functional groups, hence widely investigated in various energy storage and conversion applications. In the present work, thin films of MXenes (Ti3C2TX) have been prepared on fluorine-doped tin oxide (FTO) substrates using different concentrations in iso-propyl alcohol (10, 30, 50 mg/ml). MXenes films have been further used as a counter electrode (CE) in the fabrication of cost-effective platinum-free dye-sensitized solar cells (DSSCs). It has been observed that 30 mg/ml concentration of MXenes CE based DSSCs have shown higher power conversion efficiency as compared to other concentration and is attributed to its uniform and homogeneous surface. Moreover, the photovoltaic performance of optimized MXenes based DSSC is almost comparable to the standard Pt-based DSSC. It has been further confirmed through electrochemical impedance spectroscopy, where the charge transfer resistance at the CE-electrolyte interface significantly reduces leading to faster oxidation and reduction reactions in DSSCs resulting in lesser recombination reaction rates.