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Effect of surface treatment on photovoltaic properties of dye-sensitized solar cell based on natural dye quercetin

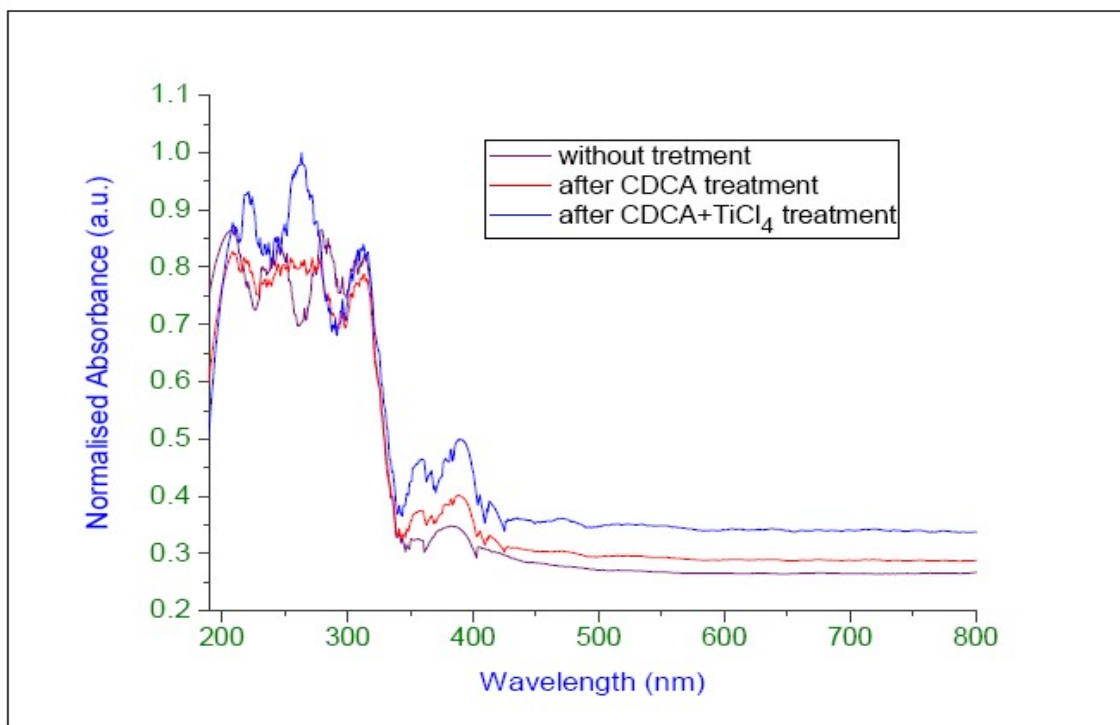
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In this study, the effects of surface treatments of working anode with co-adsorbents such as chenodeoxycholic acid (CDCA) and TiCl_4 over efficiency and other photovoltaic parameters of dye-sensitized solar cell (DSSC) have been observed. The DSSC based on natural dye quercetin as sensitizer using quasi-solid polymeric electrolyte was fabricated. The improvement in power conversion efficiency (η) from 0.13% to 0.35% was well justified by increment in various photovoltaic parameters such as open circuit voltage (V_{oc}), short circuit density (I_{sc}) and fill factor (FF). The overall increment in power conversion efficiency after CDCA + TiCl_4 treatment was found to be around three times of the efficiency of untreated device. The use of polymeric electrolyte system consisting of I^-/I_3^- redox moieties imparts stability to the devices, which is essential for the commercial potential.

Keywords: Quercetin, nano crystalline TiO_2 , DSSC, quasi solid polymeric electrolyte.