Electric and photoelectrical characterization of photovoltaic cells with TiO_2 nanocrystalline sensitized with organic dye

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In the current days is a great importance to know the electric characteristics of a photovoltaic cell. The characterization can be obtained under certain defined condition of experimentation. In this work we used the solar and 300 W white light for electric characterization of the TiO_2 dye organic photovoltaic cells (Grätzel type). The experimental system was implemented to make electric measurements, more specifically to get characteristic current-voltage curves and determinate the maximum photovoltaic power. Photocurrent in function of frequency, in visible region, measurements were also done. Electric measures were carried out on cell directly polarizing in similar diode configuration. The technical measures consist in to inject voltage from the battery in series with a potentiometer, the current and voltage of the photovoltaic cell were monitored in the darkness and illuminated conditions with halogen and solar light, respectively. Characteristic curves (I-V) similar to the direct diode polarization were obtained, the maximum power was around 15 nW and the current around 0.60 μA, the open circuit voltage was about 0.23 mV and short-circuit current was 290 μA under illumination of 300 W, it was considered an illuminated area about 5.64 cm^2. The best values obtained using a solar illumination was around 0.60 mV considering the open circuit voltage.

Keywords: Grätzel cell, TiO_2, electric measures, curves (I-V).

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