

عنوان مقاله:

(Effect of Sodium Arsenic on the Improvement of TiO_2/Dye as Photosensitizers in Dye-Sensitized Solar Cells (DSSC

محل انتشار:

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خلاصه مقاله:

The research presents the synthesis and fabrication of dye-sensitized solar cells (DSSCs) on the influence of sodium arsenic on the enhancement of TiO_2/dye as photosensitizers, where *Hibiscus sabdariffa* (roselle) and *Vernonia amygdalina* (bitter leaf) were used as a source of the chlorophyll, sodium arsenic (NaAs) material of different concentration ($0.1-0.4 \text{ mol}$), was synthesized as a layer on top of TiO_2 . The surface morphology study of $\text{TiO}_2/\text{NaAs}_{0.1}$, $\text{TiO}_2/\text{NaAs}_{0.2}$ bitter leaf dye, $\text{TiO}_2/\text{NaAs}_{0.3}$ roselle dye, and $\text{TiO}_2/\text{NaAs}_{0.4}$ the mixture of bitter leaf dye and roselle dye revealed that the micrograph is usually defined with the granular shape of nanotubes. The grain size of $\text{TiO}_2/\text{NaAs}_{0.1}$ is not too large and delineated by an immense sum of aggregated nanoparticles. The cells structure is polycrystalline with a most outstanding peak at 2θ angles of 26.73° and 51.84° corresponding to hkl index numbers (111) and (202). The films have a very high absorbance from the plot, and the absorbance of the films increases as the dye molecules vary. The high absorbance of the films shows that the DSSCs will be a good material for photovoltaic applications. The fill factor of the films is 0.54, 0.24, 0.23, and 0.99 respectively while the conversion efficiency of 0.86%, 4.48%, 3.44%, and 1.81% was recorded.

کلمات کلیدی:

TiO_2/dye , Solar Cell, Grain Size, polycrystalline, Energy

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