

## عنوان مقاله:

Nitrogen functionalized CNTs/TiO<sub>2</sub> nanocomposites used to fabricate CdS quantum dot sensitized solar cells

## محل انتشار:

شانزدهمین کنگره ملی مهندسی شیمی ایران (سال: 1397)

تعداد صفحات اصل مقاله: 5

## نویسندگان:

Laya Noori - *Department of Chemistry, Amirkabir University of Technology (Tehran Polytechnic), P.O. Box: ۱۵۸۷۵-۴۴۱۳, Tehran, Iran*

Amin Alizadeh - *Department of Chemistry, Amirkabir University of Technology (Tehran Polytechnic), P.O. Box: ۱۵۸۷۵-۴۴۱۳, Tehran, Iran*

Vahid Hoseinpour - *Department of Chemistry, Amirkabir University of Technology (Tehran Polytechnic), P.O. Box: ۱۵۸۷۵-۴۴۱۳, Tehran, Iran*

Zahra Shariatinia - *Department of Chemistry, Amirkabir University of Technology (Tehran Polytechnic), P.O. Box: ۱۵۸۷۵-۴۴۱۳, Tehran, Iran*

## خلاصه مقاله:

Effect of using nitrogen functionalized carbon nanotubes in photoanode materials of quantum dot sensitized solar cells (QDSSCs) was studied. Several SWCNT/TiO<sub>2</sub>, MWCNT/TiO<sub>2</sub> and N-doped MWCNT/TiO<sub>2</sub> nanocomposites were prepared including different weight percents (0.25–0.40 wt%) of CNTs to TiO<sub>2</sub>. The nanocomposites were applied as the photoanodes of QDSSCs. All photoanodes were fabricated by CdS and ZnS doping using successive ionic layer adsorption and reaction (SILAR) method. The measured optical band gaps of all photoanodes were approximately equal to 2.5 eV. The photoluminescence (PL) spectra of all photoanode nanocomposites illustrated four maxima at around 310, 365, 440 and 535 nm plus two shoulders near 285 and 720 nm which could be assigned to the emission bands of TiO<sub>2</sub>, CdS and ZnS nanoparticles (NPs) as well as CNTs. The highest power conversion efficiency ( $\eta$ ) was measured under one illumination of sun (AM 1.5, 100 mW/cm<sup>2</sup>) for the 0.35% N-MWCNT loaded cell (1.78%) indicating 24.47% increase in the  $\eta$  value relative to that of the cell made up of bare TiO<sub>2</sub> (1.43%).

## کلمات کلیدی:

Quantum dot sensitized solar cell; Carbon nanotube; SILAR; Nitrogen doping; Photoluminescence spectra

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/859677>

