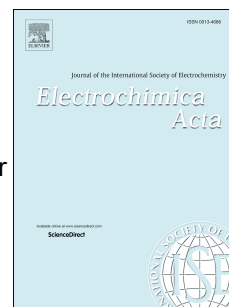


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Pt nanoparticle/Si nanowire composites as an excellent catalytic counter electrode for dye-sensitized solar cells

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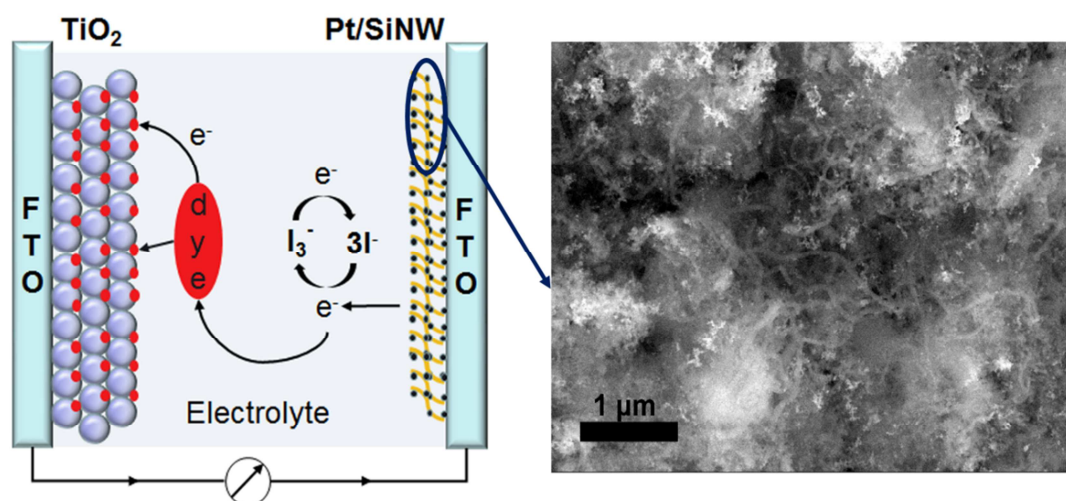
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Graphical Abstract

Pt nanoparticle/Si nanowire composites as an excellent catalytic counter electrode for dye-sensitized solar cells

Lulu Yang, Yujin Ji, Fan Liao*, Yafei Cheng, Yuyang Sun, Youyong Li, Mingwang Shao*

Jiangsu Key Laboratory for Carbon-Based Functional Materials & Devices, Institute of Functional Nano & Soft Materials (FUNSOM), Soochow University, Suzhou 215123, PR China.



Pt nanoparticle/Si nanowire composites are employed as the counter electrode in dye-sensitized solar cells. Si nanowires prevent metal nanoparticles from agglomeration. The density functional theory calculation shows that the adsorption energy of I atom on the Pt/Si interface is -0.8 eV, which is the optimal adsorption energy for triiodide reduction. The power conversion efficiency of device based on the Pt/SiNW electrode is 3.8% higher than that of the device based on Pt.

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