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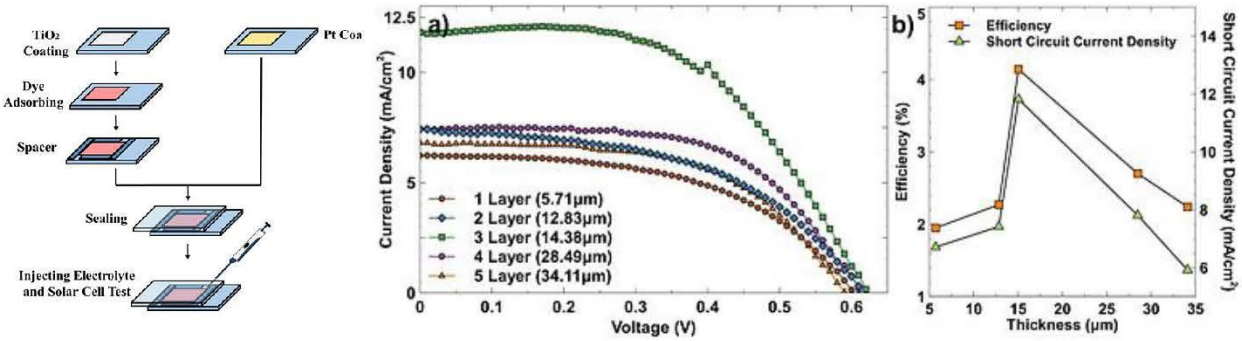
RESEARCH HIGHLIGHTS

1. Enhancing Photocurrent Performance Based on Photoanode Thickness and Surface Plasmon Resonance Using Ag-TiO_2 Nanocomposites in Dye-Sensitize Solar Cells

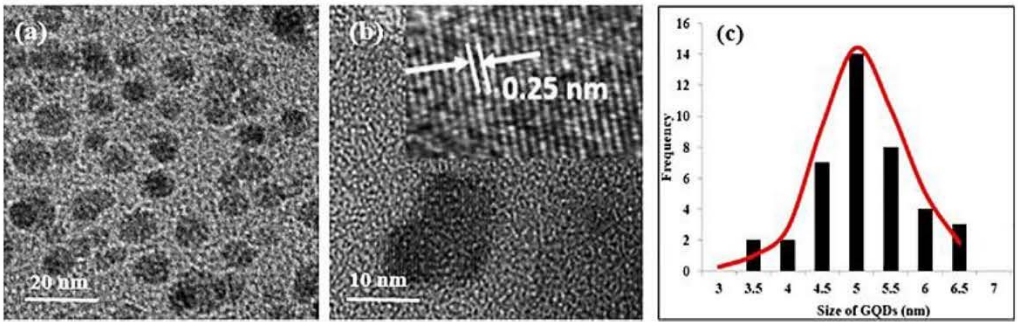
The three-layer Scotch tape, with thickness of 14.38 µm, achieved a high efficiency of 4.14%. This results showed that three layers was the optimal thickness to improve dye loading and to reduce the charge recombination rate. As for the Ag-TiO_2 nanocomposites, 10mM of AgNP, with a mean diameter of 65.23 nm and high efficiency of 6.92%, proved that SPR can enhance the absorption capability of dye and improve the photon-to-electron generation.



Lokman, M.Q.; Shafie, S.; Shaban, S.; Ahmad, F.; Jaafar, H.; Mohd Rosnan, R.; Yahaya, H.; Abdullah, S.S. Enhancing Photocurrent Performance Based on Photoanode Thickness and Surface Plasmon Resonance using Ag-TiO_2 Nanocomposites in Dye-Sensitized Solar Cells. *Materials* **2019**, *12*, 2111.

2. Charge transport and electron recombination suppression in dye-sensitized solar cells using graphene quantum dots

GQDs increased light absorption of TiO_2 photoelectrode at visible spectrum in the range of λ=375 nm to λ=600 nm, resulting highest current–density, Jsc and photon-to-current conversion efficiency, Ηc. Solar cell sensitized in 7.5 mg/ml concentration of GQDs shown the highest reading by 15.49 mA/cm2 and 6.97%, which indicated an improvement by 28.07% and 70.83% for Jsc and Η compare to pristine TiO_2 DSSC.



N. Fadzilah M. Sharif, M.Z.A.A. Kadir, Suhaidi Shafie, Suraya Abdul Rashid, W.Z. Wan Hasan, Suraya Shaban, Charge Transport and Electron Recombination Suppression in Dye-sensitized Solar Cells using Graphene Quantum Dots, Results in Physics, Volume 13, 2019, 102171.