

Supplementary Information

Enhanced Efficiency in Dye-Sensitized Solar Cells by Electron Transport and Light Scattering on Freestanding TiO₂ Nanotube Arrays

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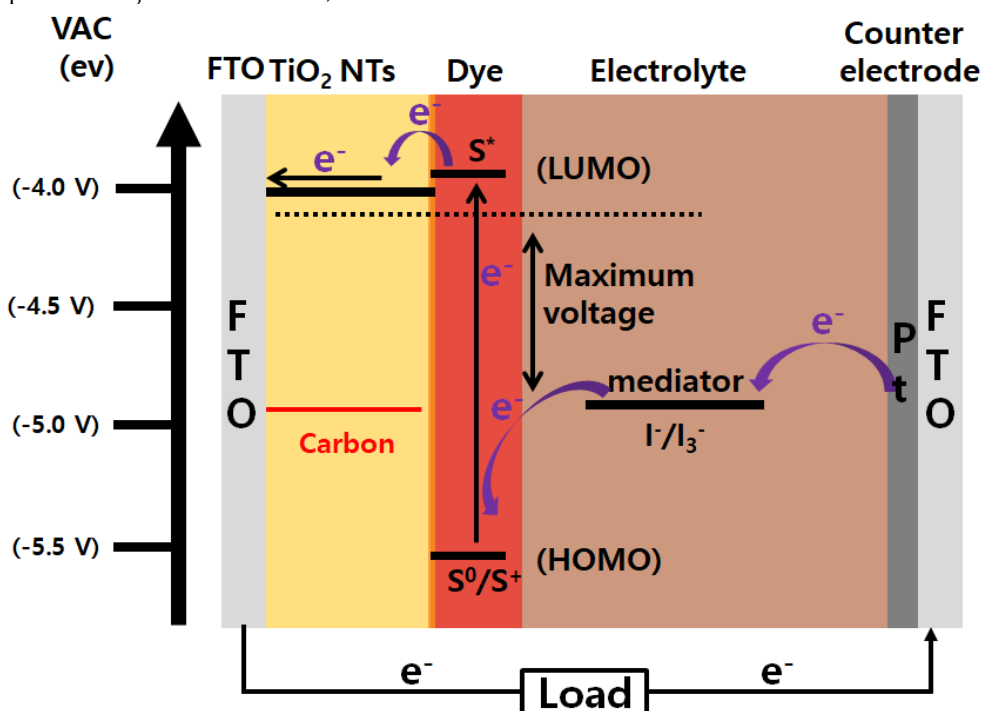


Figure S1. Energy band diagram of DSSCs based on closed- or open-ended TiO₂ nanotube arrays with carbon materials.

When carbon materials were introduced on the closed- or open-ended TiO₂ nanotube arrays, the energy level of the conduction band of the closed- or open-ended TiO₂ nanotube arrays decreased, since work functions of the carbon materials were low (-4.9 eV) as shown in Figure S1. Compared to the DSSCs based on closed-ended TiO₂ nanotube arrays, the V_{oc} value of the DSSCs based on open-ended TiO₂ nanotube arrays showed a small increment (0.80 V to 0.81 V) due to an increase in electron density of the TiO₂ nanotube arrays from higher electron density. However, when carbon materials were introduced on the closed- or open-ended TiO₂ nanotube arrays, the V_{oc} value of the DSSCs showed a slight decrement (0.81 V to 0.79 V) because of the reduced work function of carbon materials. Enhancing electron transport by carbon materials would be helpful to improve the J_{sc} value which is positive to energy conversion efficiency.

Reference

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