

## Supporting Information

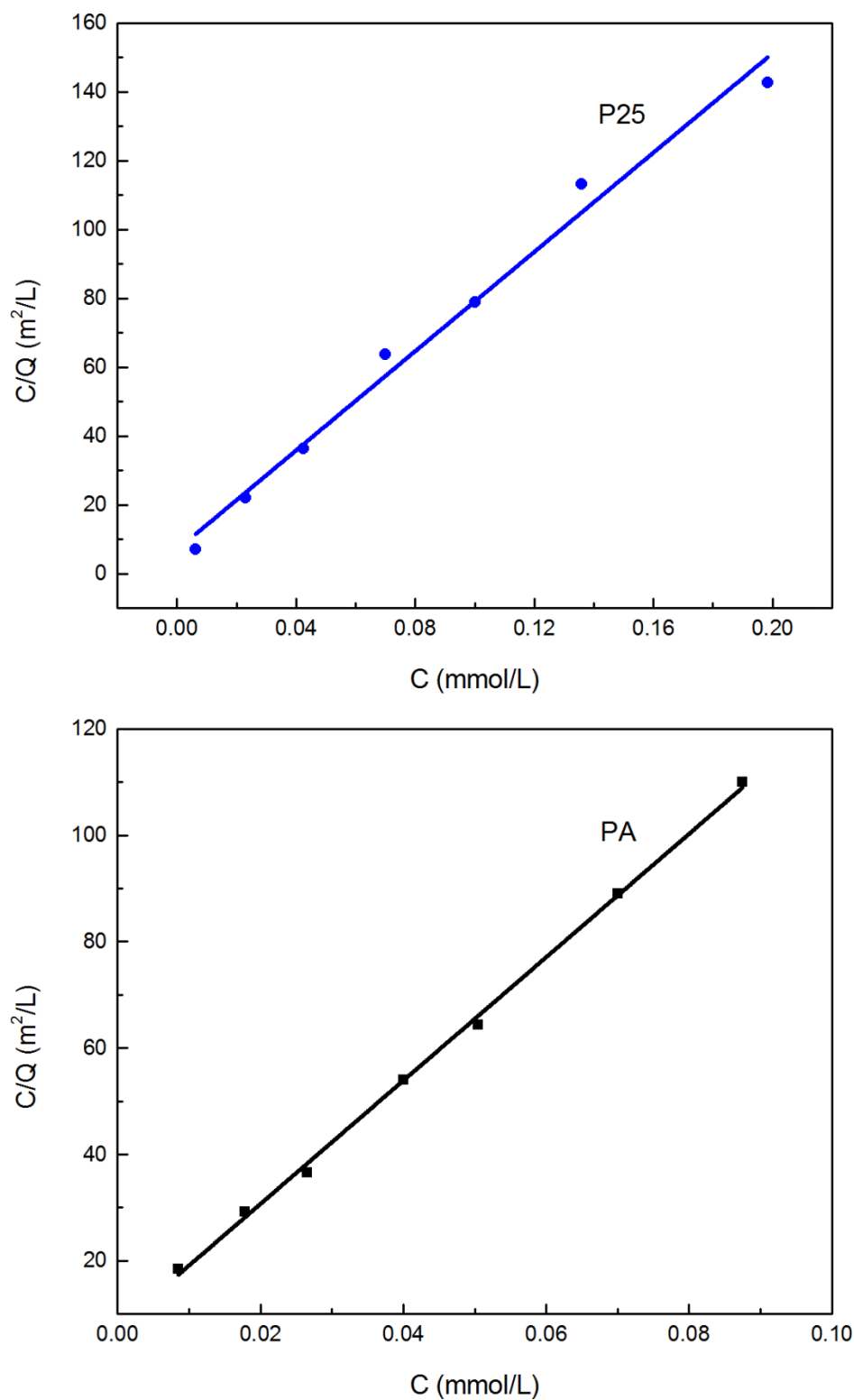
# Interplay Between Dye Coverage and Photovoltaic Performances of Dye-Sensitized Solar Cells Based on Organic Dyes

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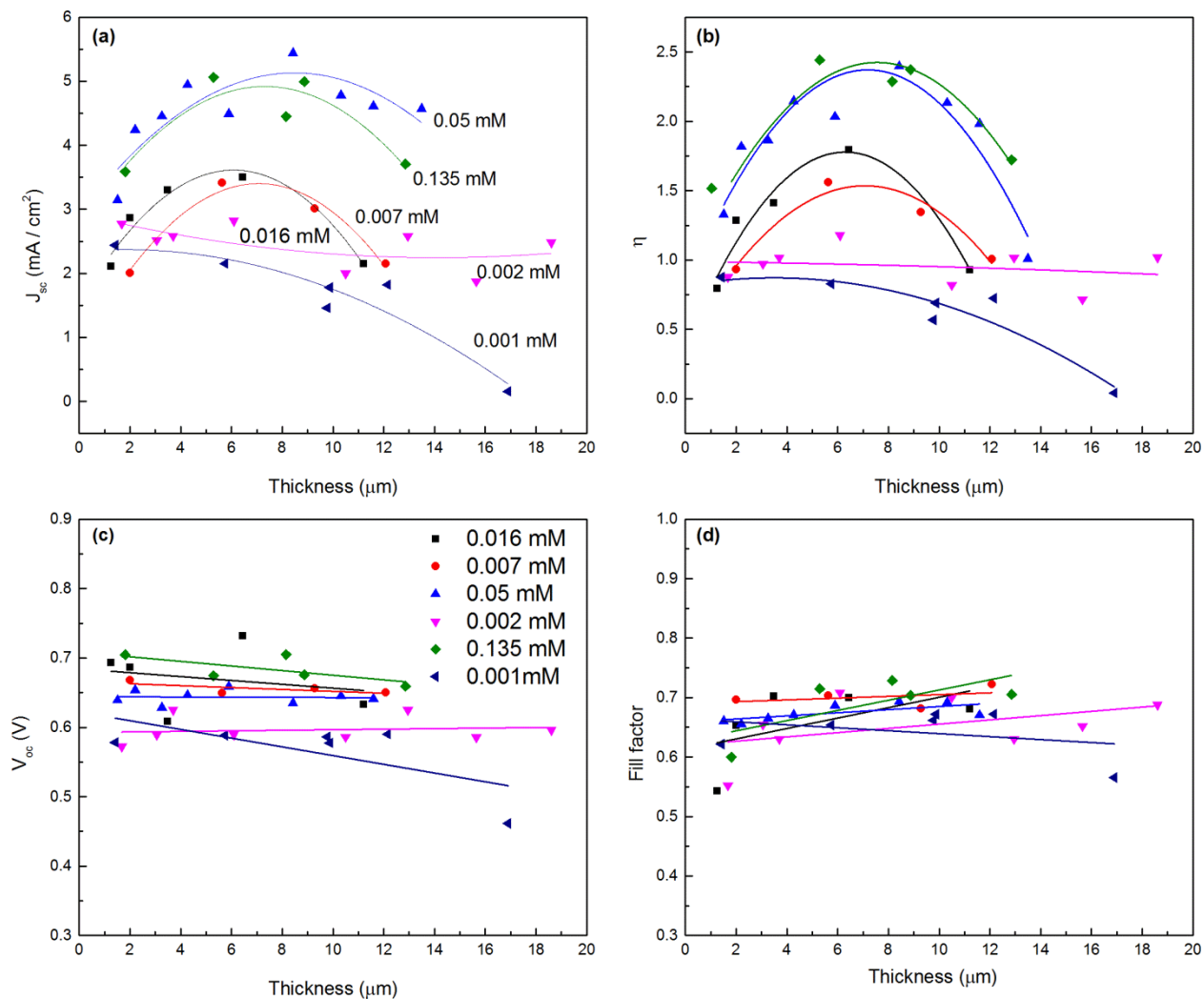
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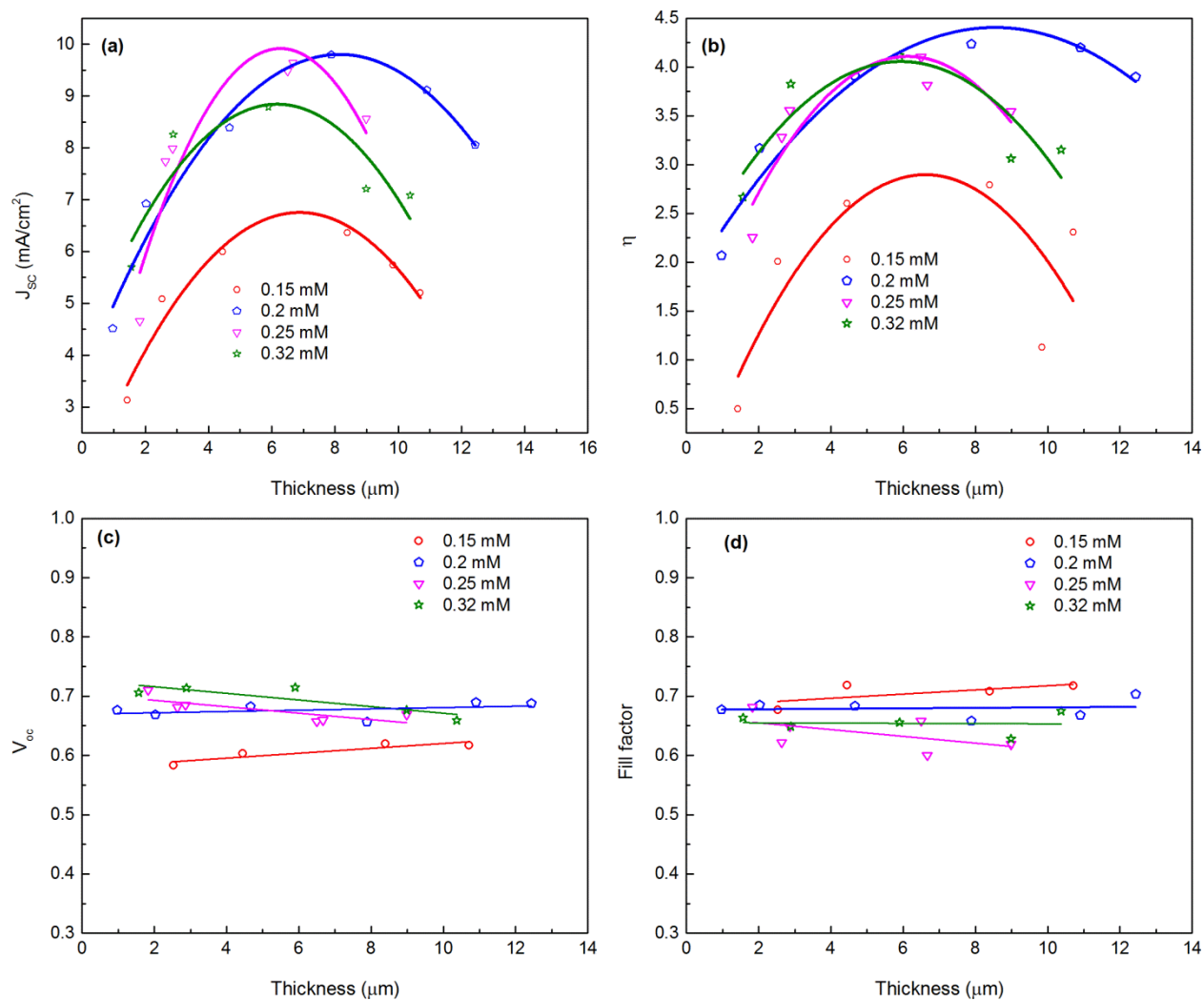


**Figure S1.** Linearized absorption isotherms for MK-2 dye on P25 and PA-TiO<sub>2</sub> nanoparticles.

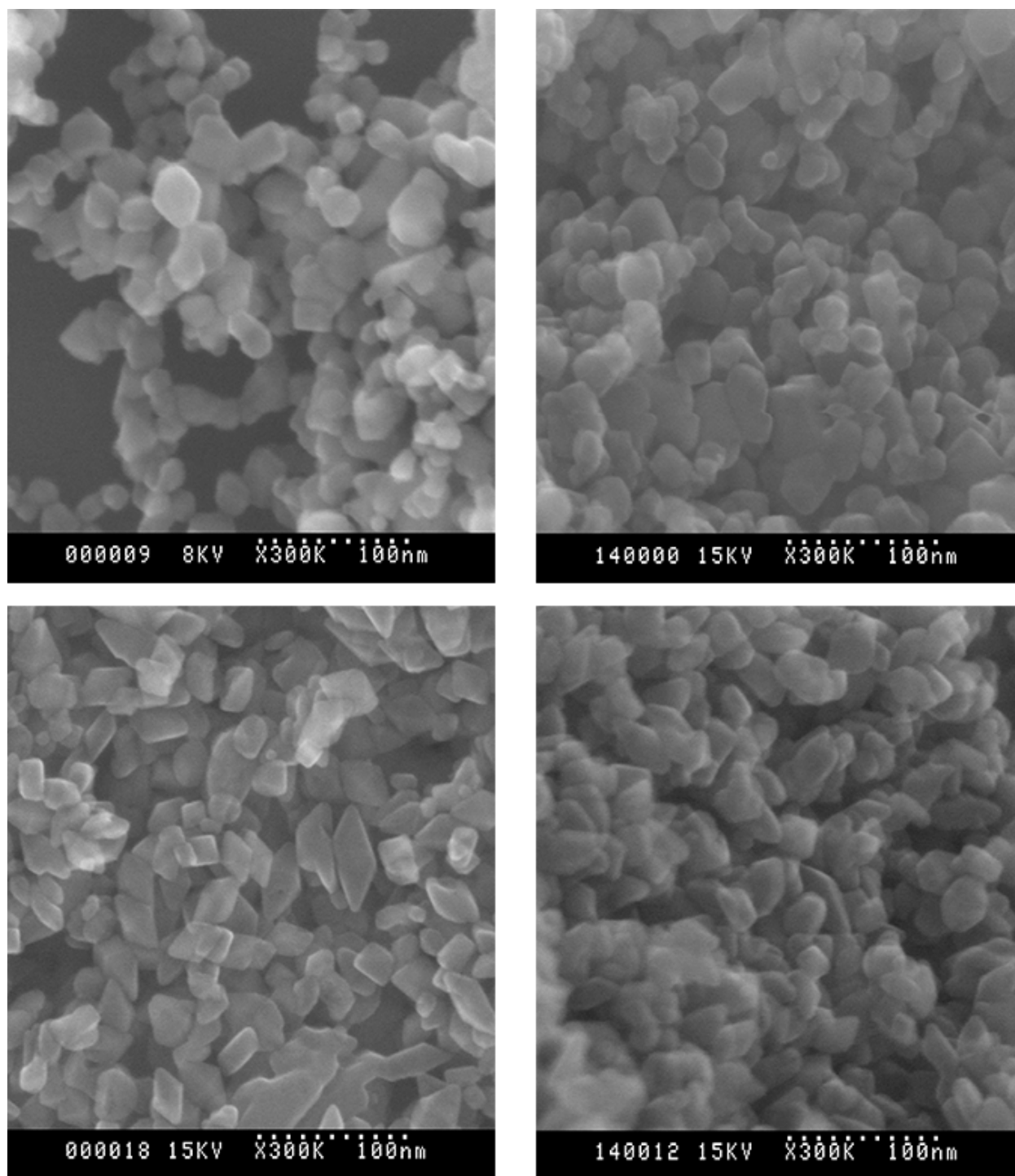
The least square values ( $R^2$ ) are equal to 0.987 for P25 and 0.998 for PA.



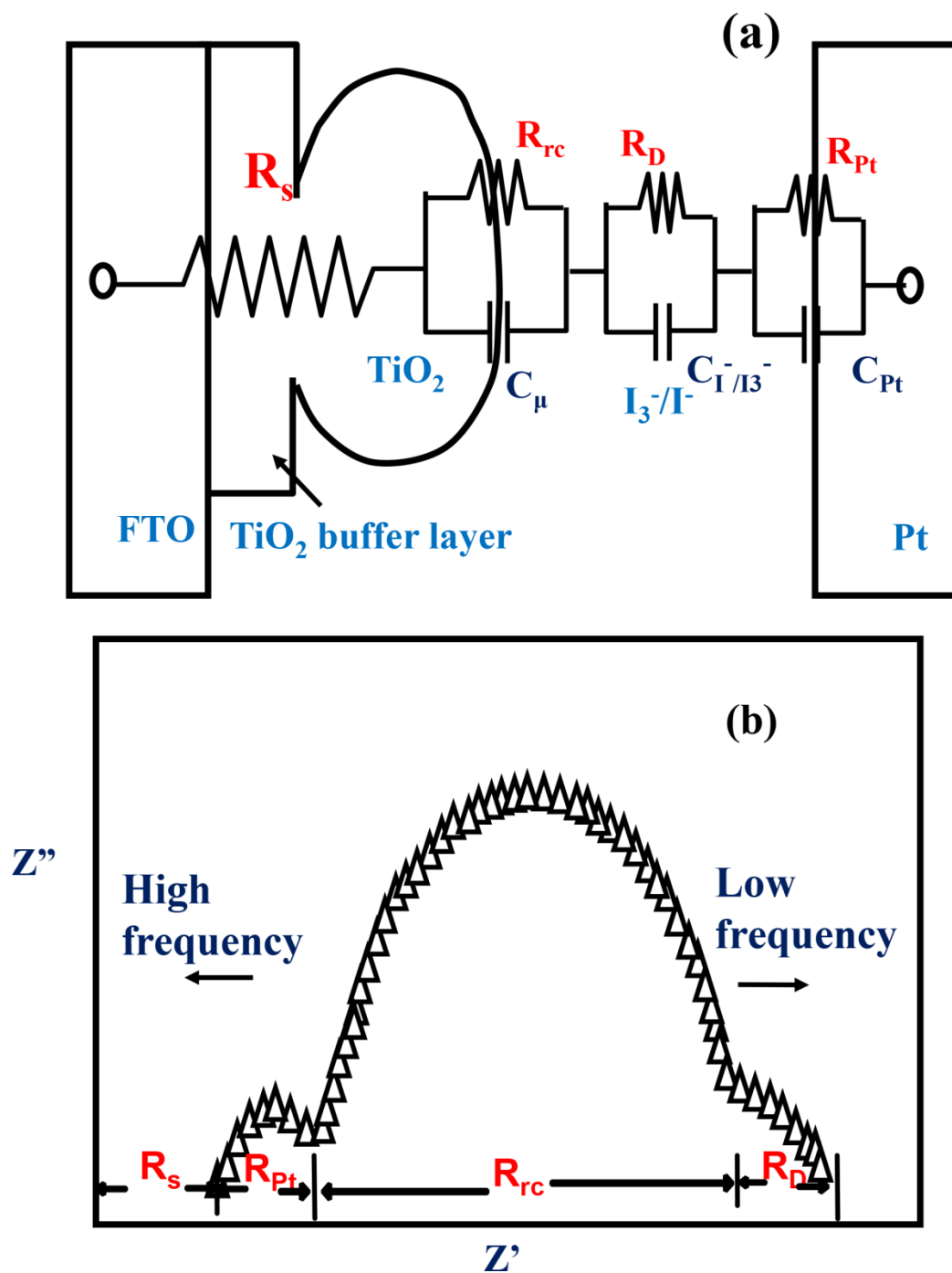
**Figure S2.** Photovoltaic-characteristics variation with P25-TiO<sub>2</sub> film thickness: (a)  $J_{sc}$ ; (b)  $\eta$ ; (c)  $V_{oc}$ ; (d) fill factor.



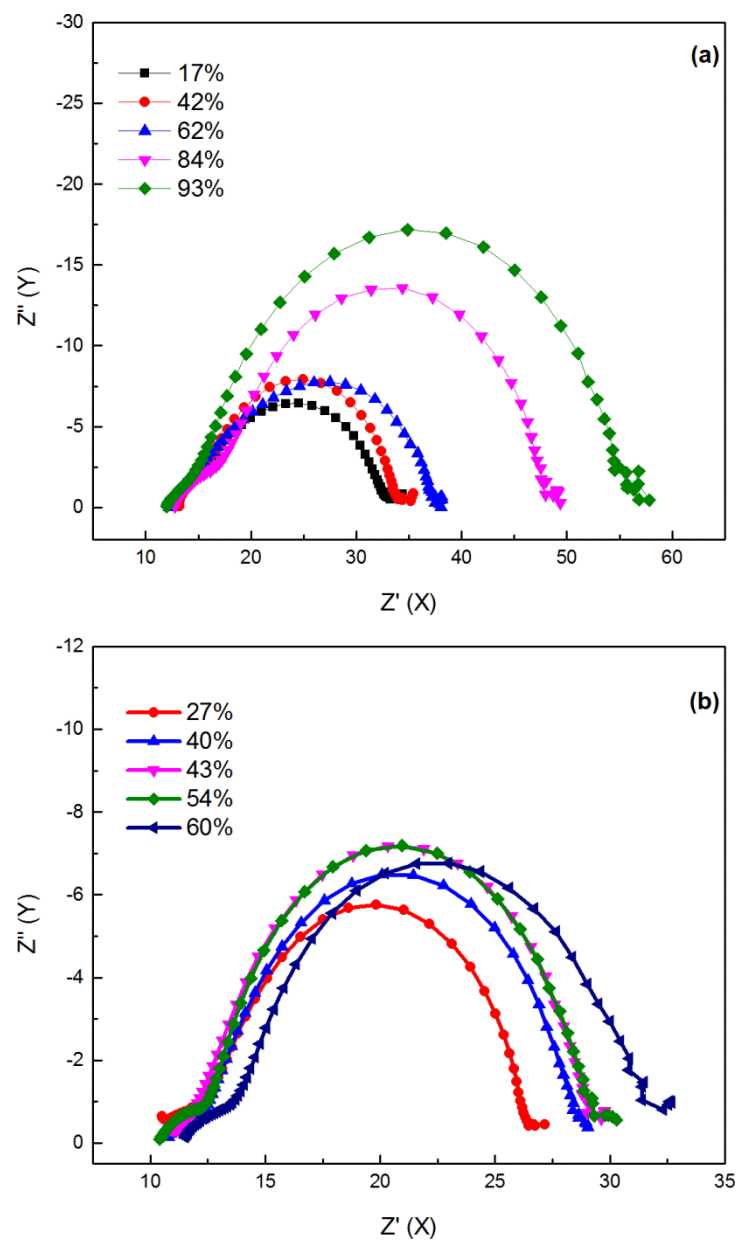
**Figure S3.** Photovoltaic-characteristics variation with PA-TiO<sub>2</sub> film thickness: (a)  $J_{sc}$ ; (b)  $\eta$ ; (c)  $V_{oc}$ ; (d) fill factor.



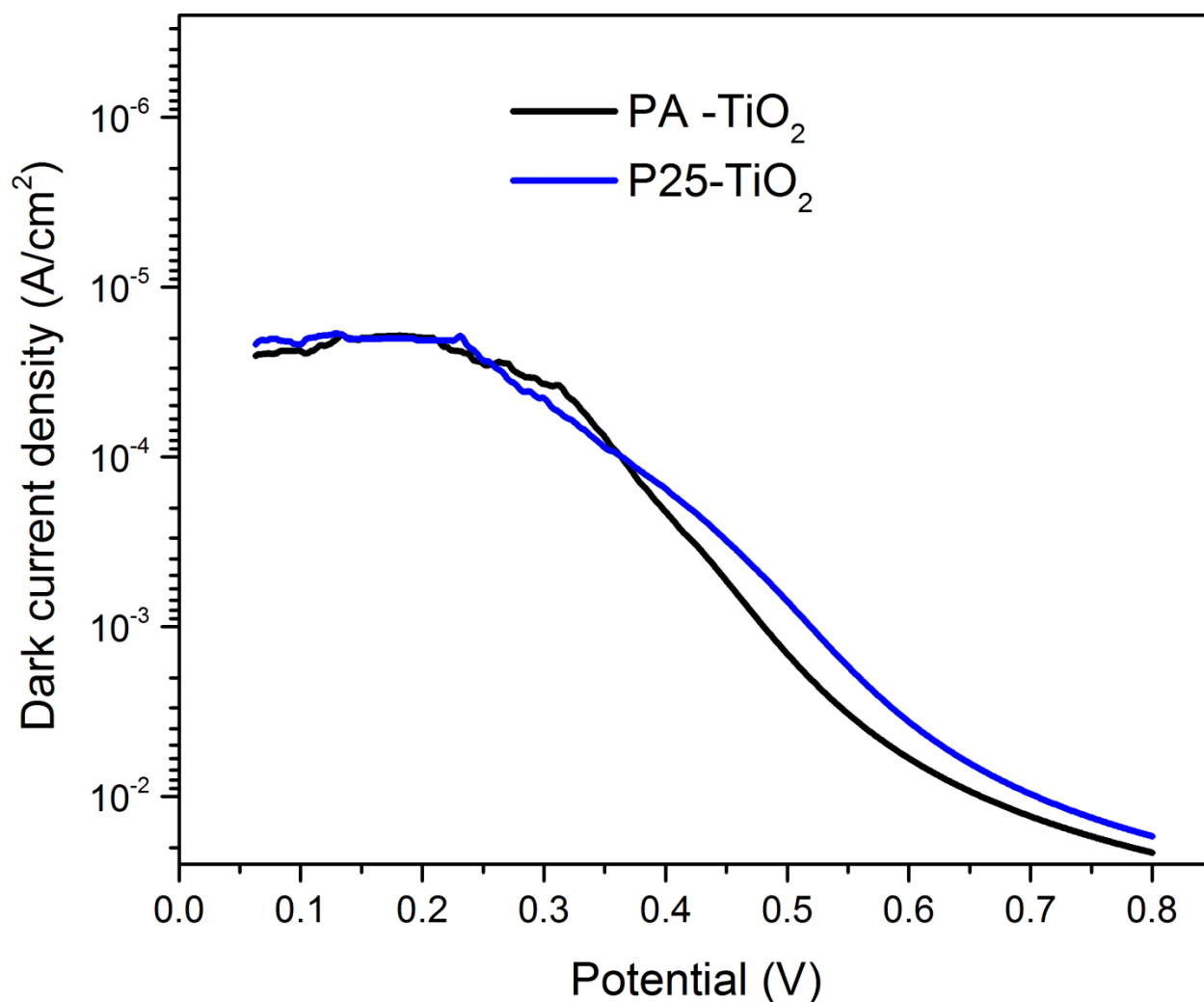
**Figure S4.** FE-SEM images: (a) P25 nanoparticles; (b) cross-sectional view of heat-treated P25 film; (c) PA nanoparticles; (d) cross-sectional view of heat-treated PA film.



**Figure S5.** Equivalent circuit diagram (a) and model (b) used to fit the impedance data.



**Figure S6.** Nyquist plots of DSSCs fabricated using P25 and PA  $\text{TiO}_2$  electrodes with different dye coverage:(a) P25 and (b) PA-  $\text{TiO}_2$ .



**Figure S7.** Dark current density in log scale Vs bias potential of the P25 and PA cells.

In the low-forward-bias region both cells exhibit almost similar dark-current values showing a similar blocking effects of the cells in the TiO<sub>2</sub> buffer layer/ electrolyte interface. In the high forward bias region ( $\sim 0.4$  V onward), dark-current values of P25-TiO<sub>2</sub> is lower than PA-TiO<sub>2</sub>. It can be attributed to its high  $R_{rc}$  value due to high TiO<sub>2</sub> surface coverage.