Supplementary data

Surface Passivation of Titanium Dioxide via Electropolymerization Method to Improve the Performance of Dye-Sensitized Solar Cells

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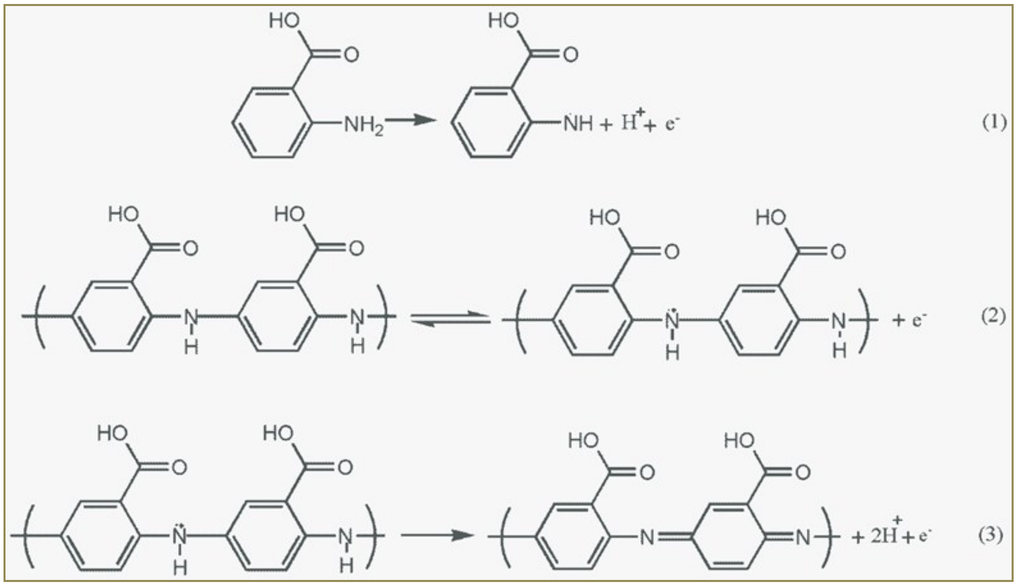

Fig. 1S Mechanism for electropolymerization of PAA

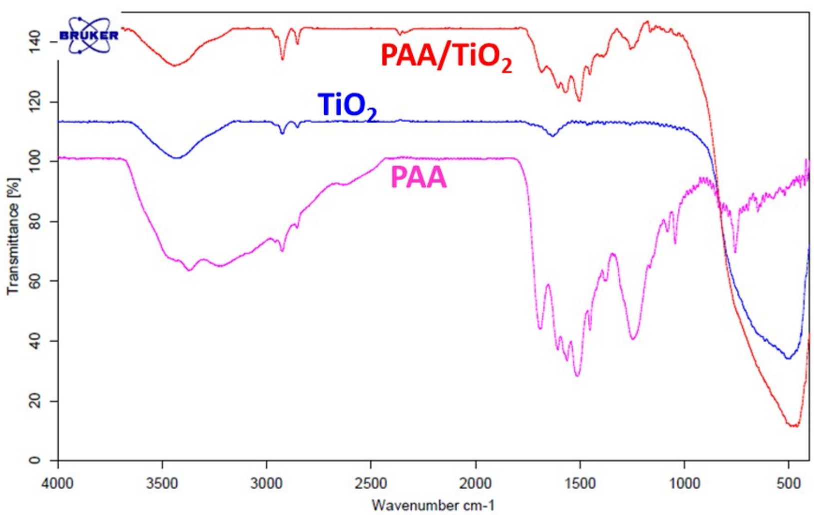

Fig. 2S FT-IR spectra of PAA, TiO_2 and PAA/ TiO_2

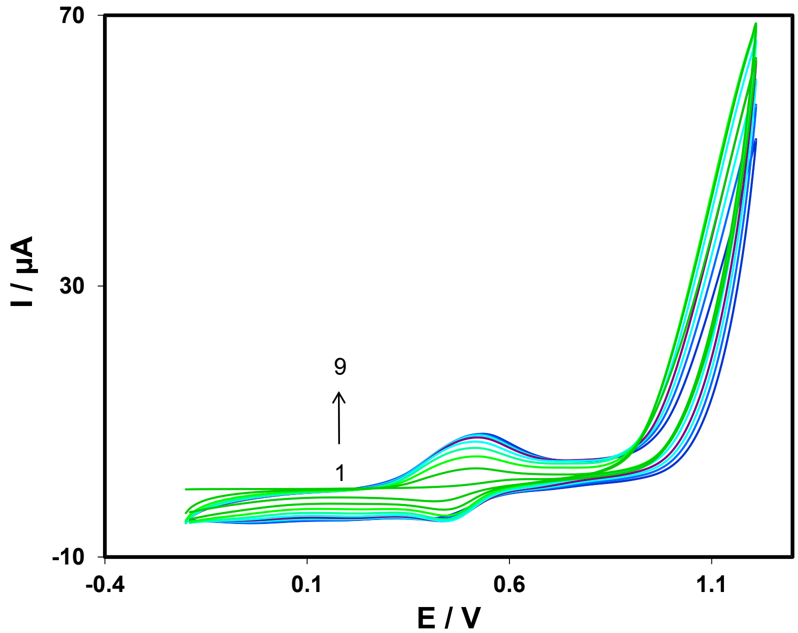

Fig. 3S Cyclic voltammograms in the course of polymerization of 10 mM AA at 9 times of potential scanning in acetonitrile containing 0.1 M tetrabutylammonium perchlorate.

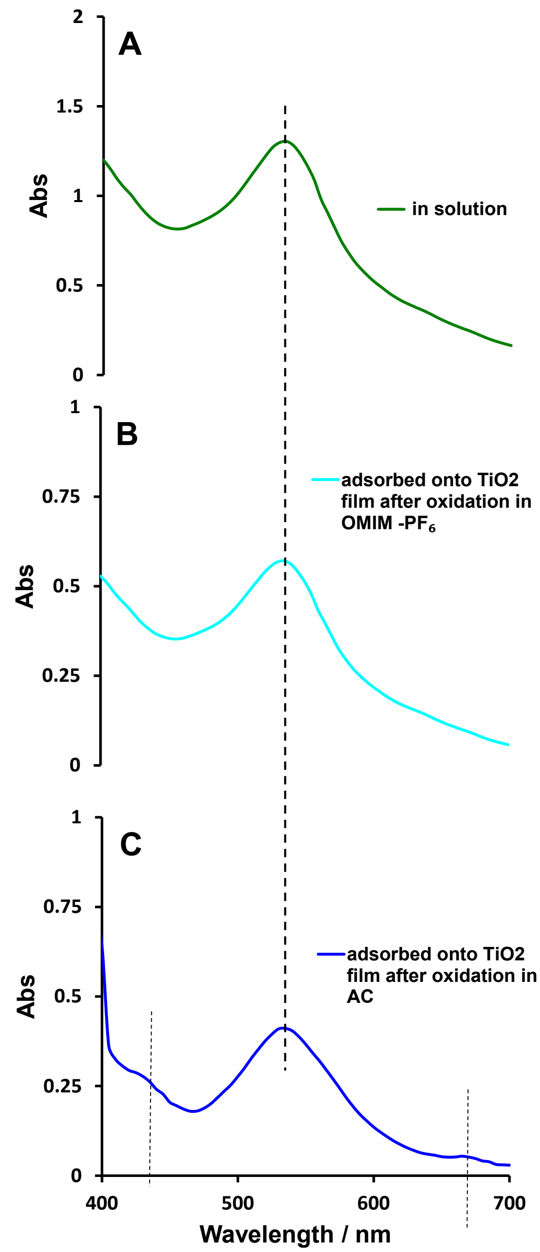

Fig. 4S (A) UV/Vis absorption spectrum for 0.04 mM N719 in a mixture of acetonitrile and tertbutyl alcohol (volume ratio, 1:1) (B) UV/Vis absorption spectrum for N719 adsorbed onto a TiO_2 electrode/N719 after electropolymerization of AA in OMIM-PF_6 (electrode B). (C) UV/Vis absorption spectrum for N719 adsorbed onto a TiO_2 electrode/N719 after electropolymerization of AA in acetonitrile 0.1 M tetrabutylammonium perchlorate.

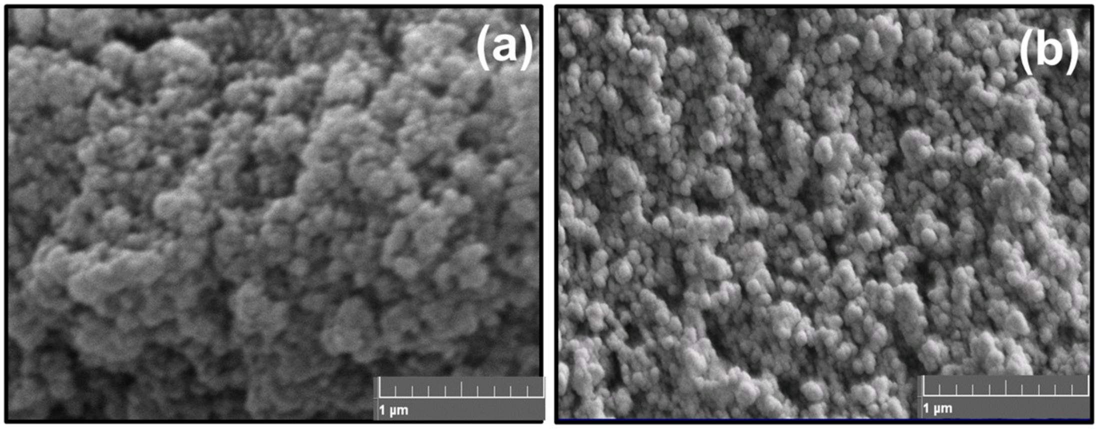

Fig. 5S SEM photographs of the electrode B (a) and electrode A (b).

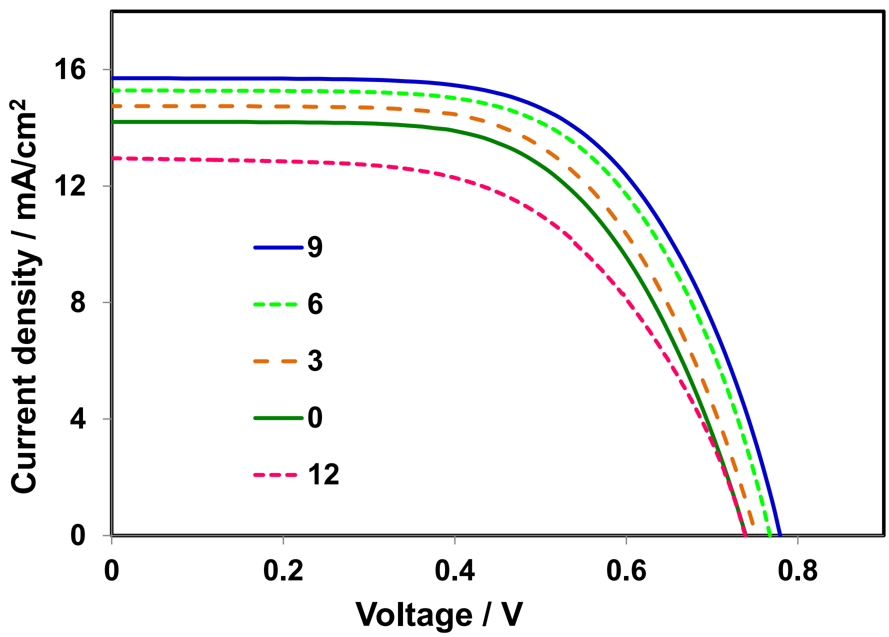

Fig. 6S Representative photocurrent–voltage curves for DSCs sensitized with N719 plus PAA under varying cycle number.

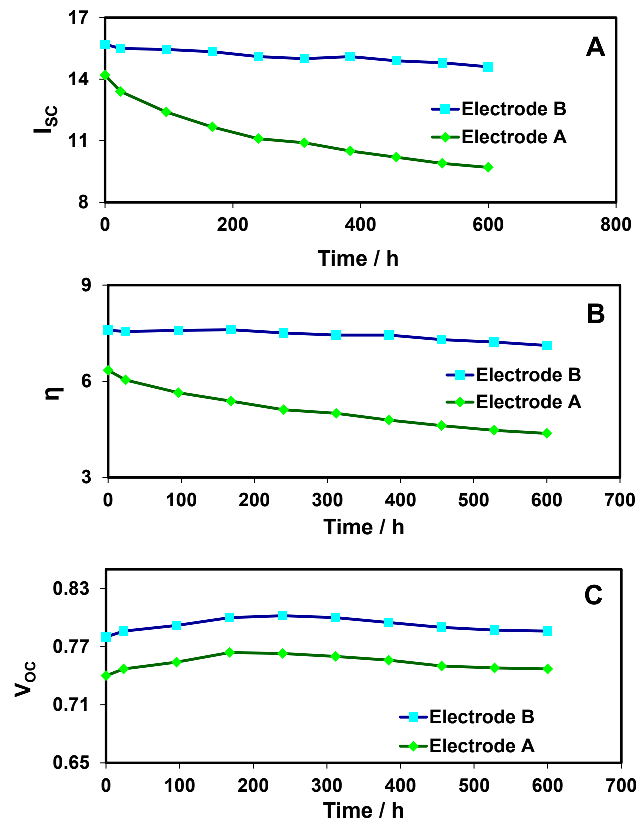

Fig. 7S Evolution of (A) the current density (mA cm^{-2}), (B) the conversion efficiency (η) and (C) open circuit voltage of electrode A (N719) and electrode B (N719 encapsulated by PAA). These devices were aged at 60 °C in the dark.

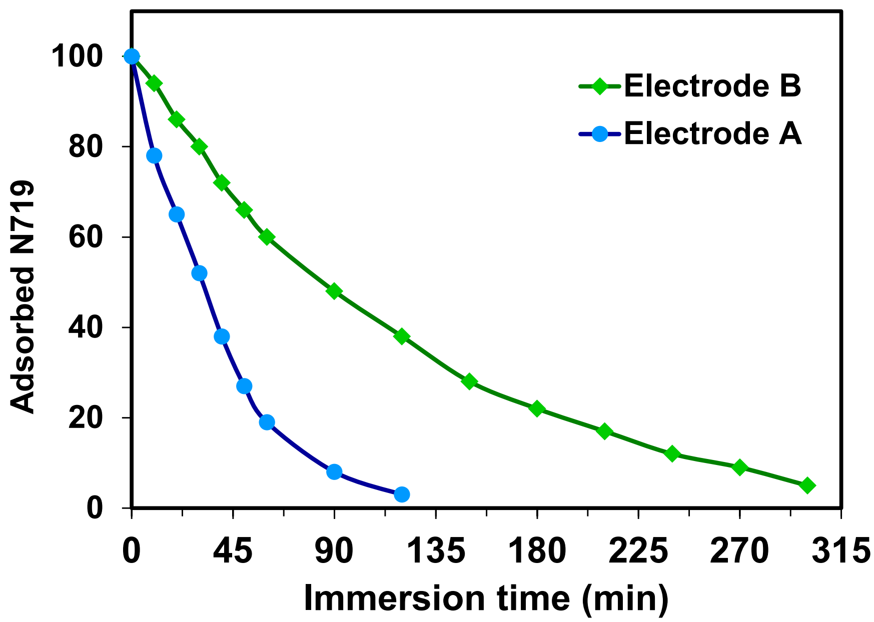

Fig. 8S Relative adsorbed N719 on electrode A and B by detaching with KOH aqueous solution as a function of immersion time. This indicated that the adsorbed N719 on electrode B are more resistance for the detachment due to the polymer film insulating N719.