Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics

Comparing Spiro-OMeTAD and P3HT Hole Conductors in Efficient Solid State Dye-Sensitized Solar Cells – **Supporting Information**

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Spectroelectrochemistry of D35 and M3

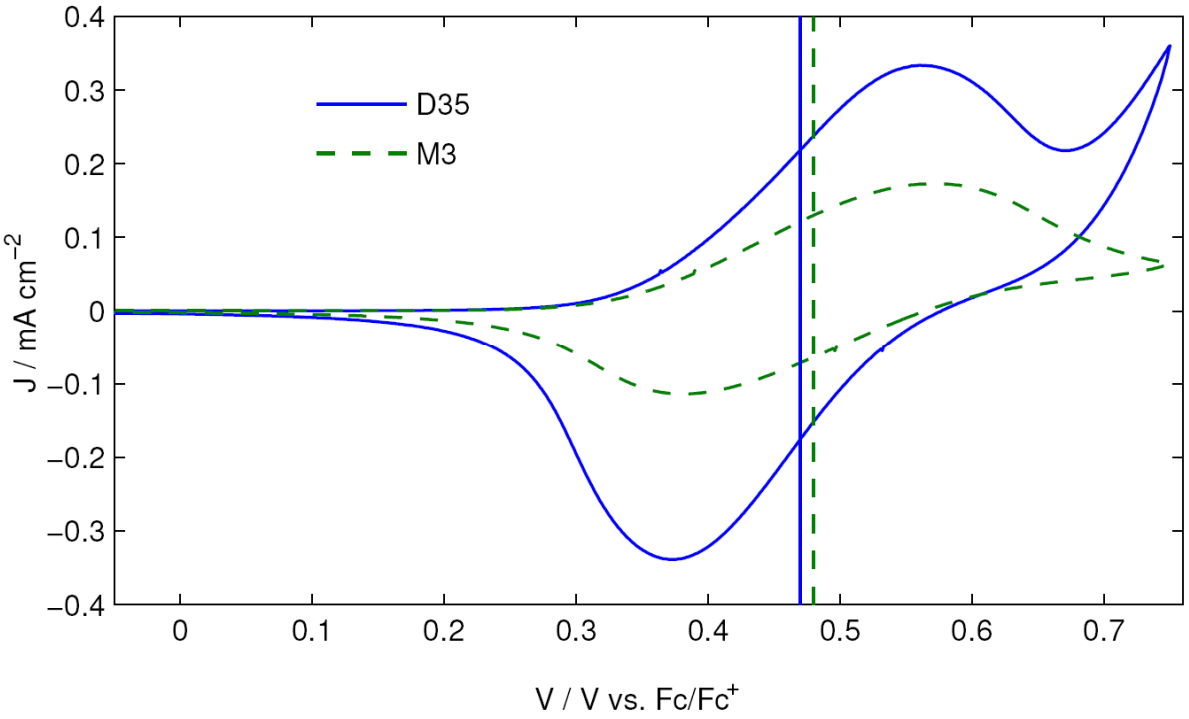

Fig. S1: Cyclic voltammetry of D35 and M3 adsorbed to a mesoporous TiO_2 electrode measured with a scan rate of 0.01 V s^{-1}. A supporting electrolyte containing 0.1 M $LiClO_4$ in MPN was used. Oxidation potentials for D35 and M3 are indicated by vertical lines.

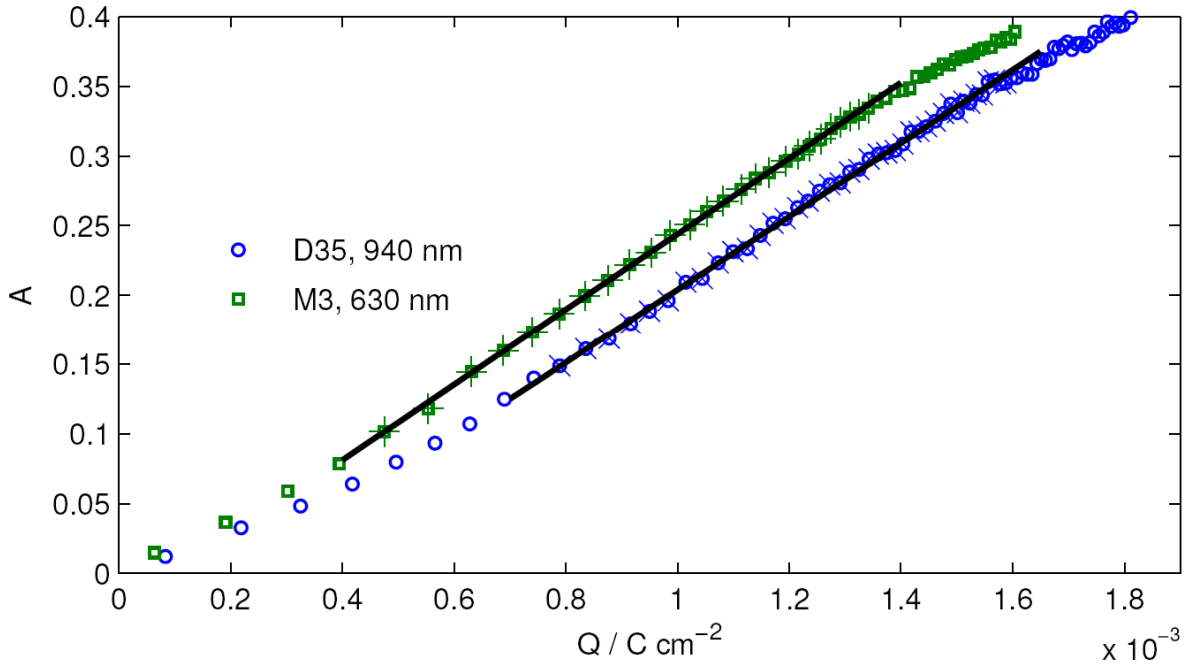

Fig. S2: Absorbance of D35 and M3 at a selected wavelength versus charge accumulated in a potential step experiment of D35 or M3 adsorbed to a mesoporous TiO_2 electrode after the potential had been stepped to the oxidation potential of each dye. Extinction coefficients were obtained by linear fits (black lines) to the data in time regions between 2.5 and 15 seconds after the step (indicated by x for D35 and + for M3).

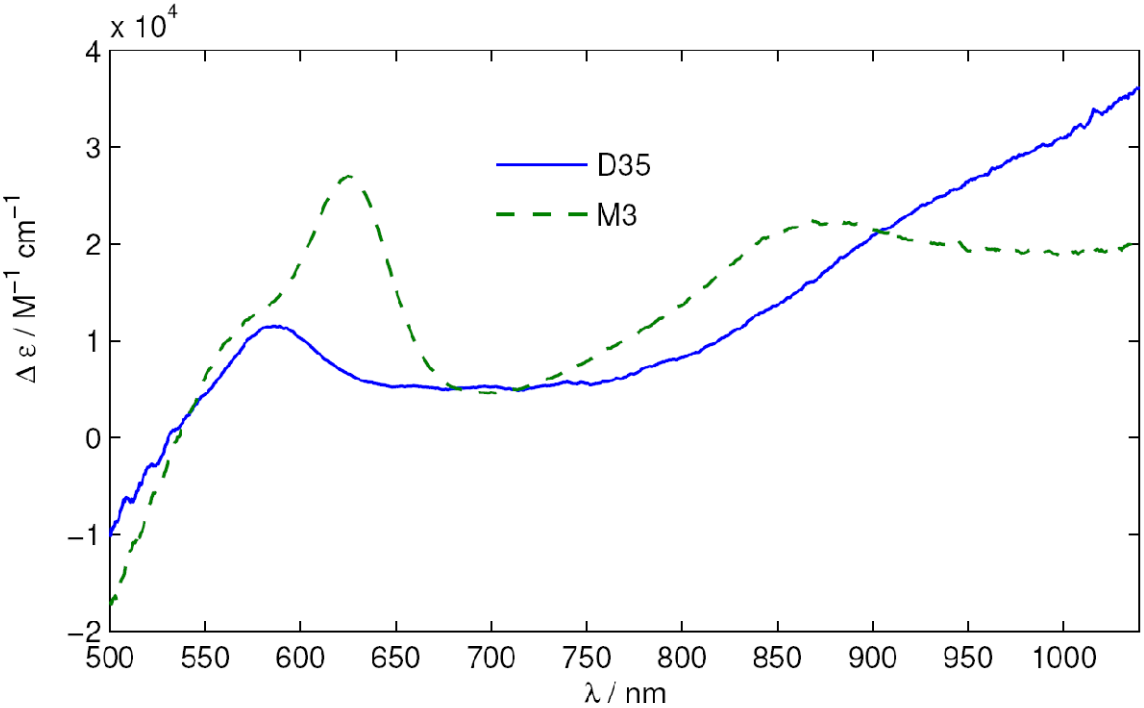

Fig. S3: Difference in extinction coefficient between oxidized and ground-state D35 and M3 determined as described in Fig. S2.

Spectroelectrochemistry of P3HT:

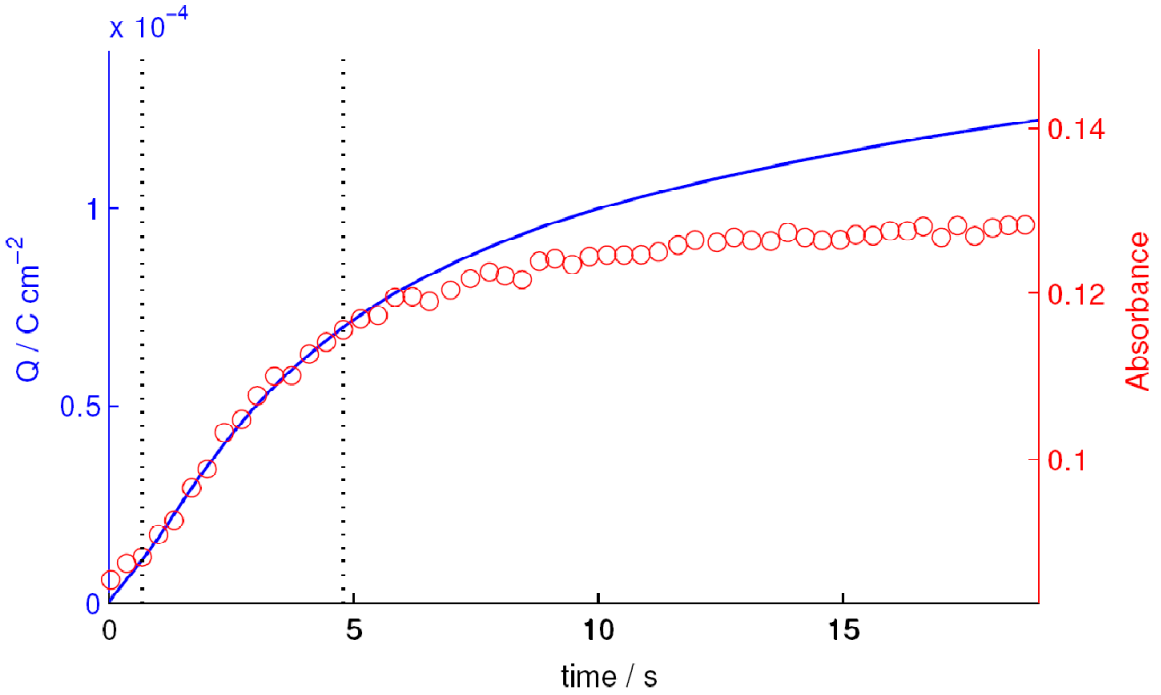

Fig. S4: Charge accumulated and change in absorbance at 760 nm of a P3HT film spincoated on a FTO substrate used as working electrode in a potential step experiment. At time = 0 s, the potential at the working electrode was stepped from -0.24 V to 0.14 V vs. Fc/Fc^+. Differences in extinction coefficients between oxidized and ground-state P3HT were obtained by linear fits of the absorbance at different wavelength vs. the charge in the time window indicated between the dashed lines. The onset of oxidation for P3HT had been determined in a separate experiment to be approximately 0.05 V vs. Fc/Fc^+. 0.1 M $TBAClO_4$ in MPN was used as a supporting electrolyte in this experiment.

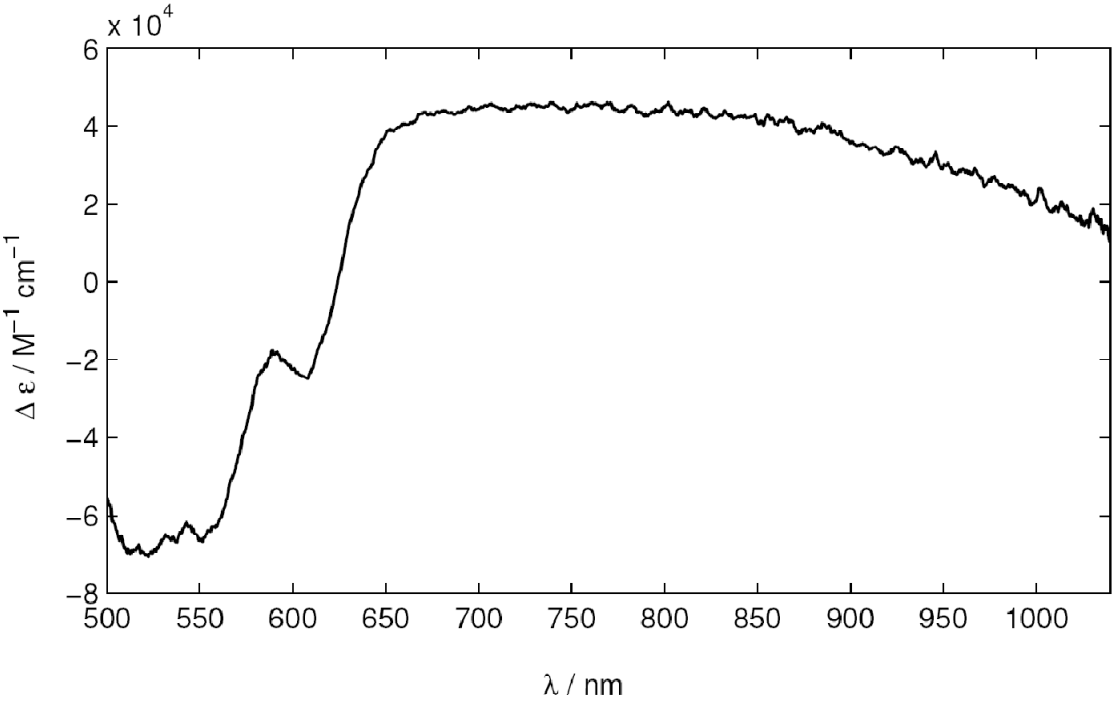

Fig. S5: Difference in extinction coefficient between oxidized and ground-state P3HT determined as described in Fig. S4.