

Supplementary Information

Structural Variations of D- π -A dyes Influence on the Photovoltaic Performance of Dye-Sensitized Solar Cells

Magdalena Marszalek,^{a‡} Satyawan Nagane,^{b‡} Amol Ichake,^b Robin Humphry-Baker,^a Vincent Paul*^b Shaik M. Zakeeruddin,*^a and Michael Grätzel*^a

^aLaboratory for Photonics and Interfaces, Ecole Polytechnique Fédérale de Lausanne, 1015, Lausanne, Switzerland. E-mail: shaik.zakeer@epfl.ch, michael.gratzel@epfl.ch Fax: +41 (0)21 693 61 00; Tel: +41 (0)21 693 31 12;

^b Room 288, Organic Chemistry Division, National Chemical Laboratory, Pashan Road, Pune 411008, India. E-mail: vp.swamy@ncl.res.in Fax: +91 (0)20 2590 2629; Tel: +91 (0)20 2590 2286;

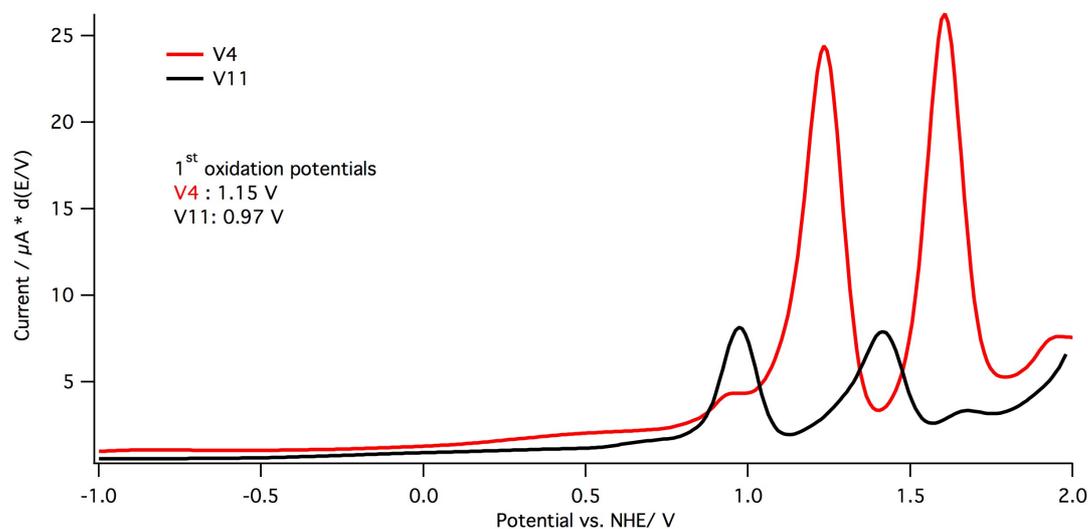


Figure S1 Oxidation potentials for dyes V4 and V11 measured by differential pulse voltammetry technique.

The differential pulse voltammetry (DPV) of dyes was measured in dichloromethane solution containing tetrabutylammonium hexafluorophosphate (0.1M) as a supporting electrolyte. Glassy carbon and Pt were used as working and counter electrodes, respectively under Ar atmosphere. The redox potentials were calibrated with ferrocene as an internal reference, however the plots presented above do not contain ferrocene peak for the sake of clarity. We used a conversion factor of +0.7 V between the ferrocene and NHE in dichloromethane.

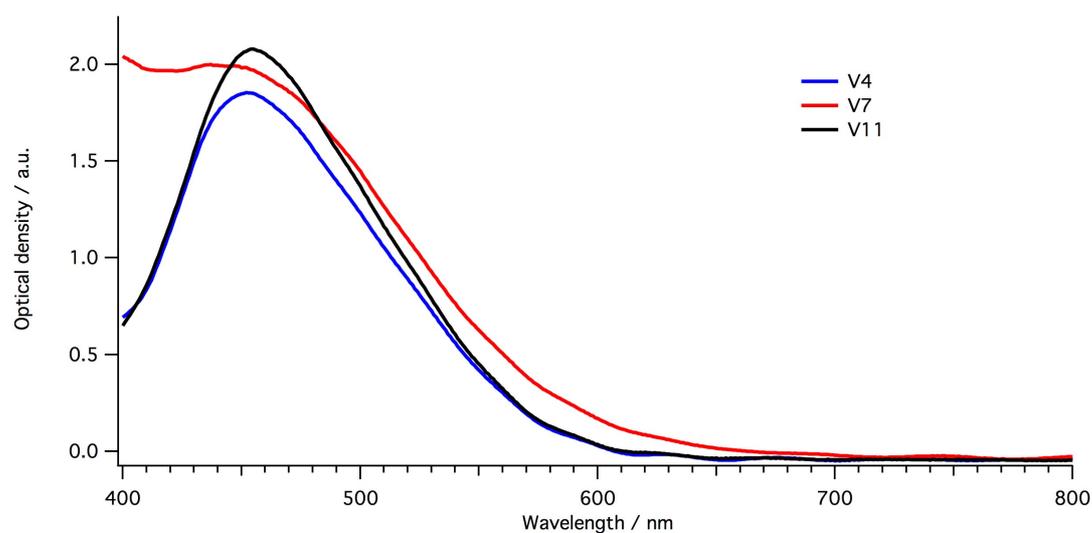


Figure S2. Thin transparent TiO₂ (3 μm) films were stained in dichloromethane solutions of dyes overnight and rinsed in the same solvent prior to the measurements.

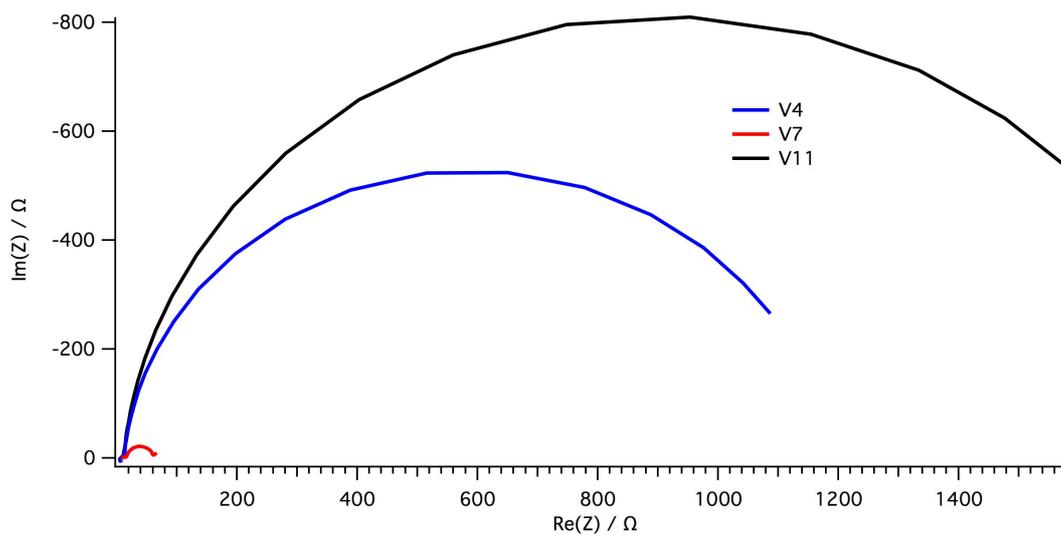


Figure S3. Typical electrochemical impedance spectra of devices with V4, V7 and V11 dyes in the form of Nyquist plots. The spectra were measured with an external corrected potential of 0.6 V in the dark.

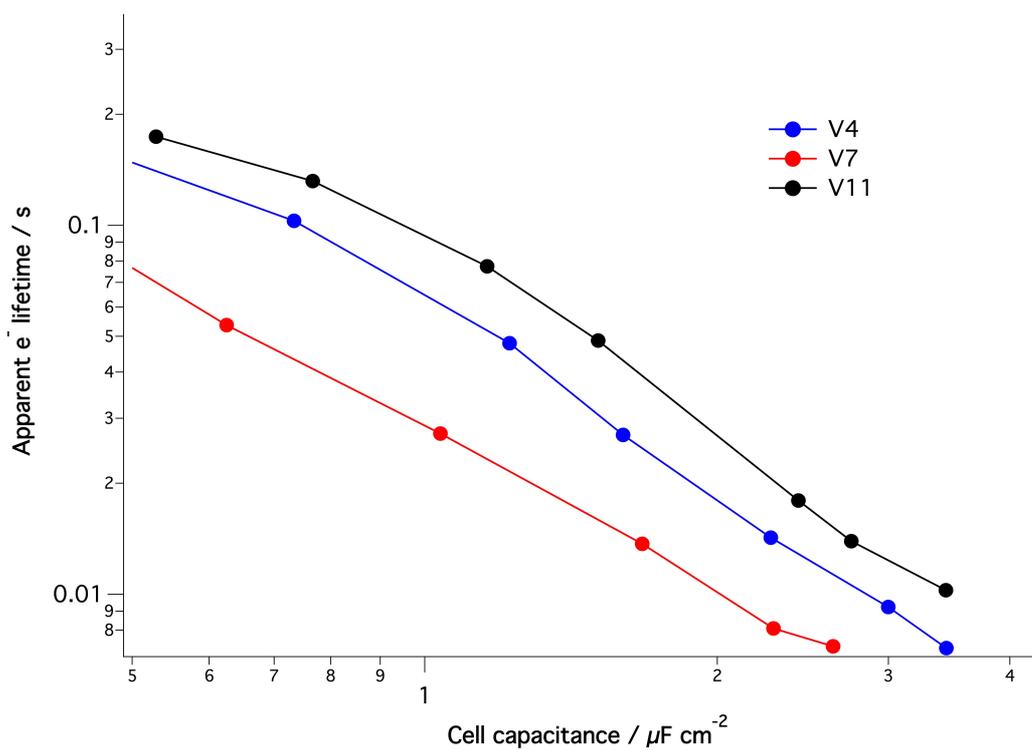


Figure S4. Apparent electron lifetime as a function of cell capacitance measured by transient measurements.

Table S1 dye loading data of three dyes on a transparent TiO₂ film

Dye	Optical density / a.u.	Dye concentration / mM
V4	1.85	111.18
V7	2.12	234.26
V11	1.99	157.20