

Organic dyes for the sensitization of ZnO nanostructured photoanodes: effect of the anchoring functions

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Molecule (trans)	thio	btdz	ph	C=C	CN	COOH	PO ₃ H ₂
6ORK1	6.5	40.86	11.26	18.09	2.27	4.51	-
MG100	7.95	43.08	16.97	17.95	3.42	-	0
MG41	3.86	23.29	18.77	28.35	4.80	2.21	-

Table S1: Contribution of the various groups to the LUMO (%). Thio = thiophene, btdz = benzothiadiazole, ph = phenyl (bearing the cyanoacrylic group). % are calculated from coefficients $\geq 1\%$. Total is not = 100% (between 83-90%).

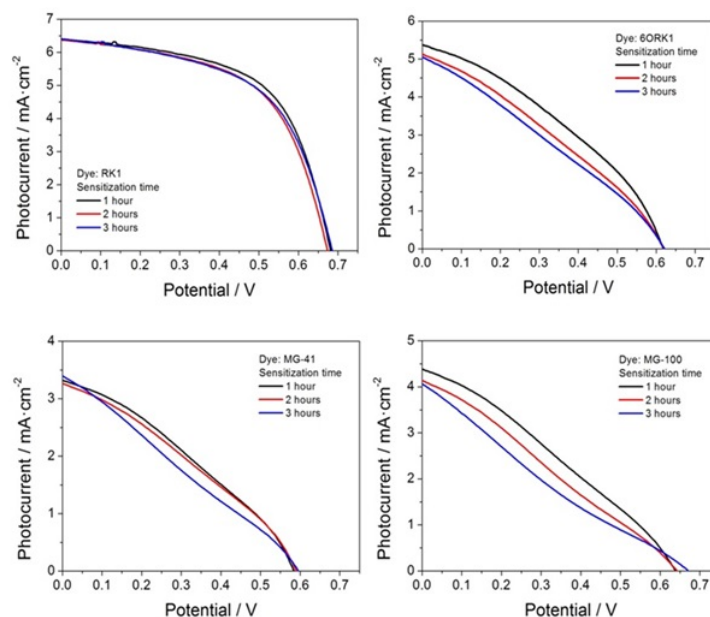


Figure S1: Current-voltage characteristics under 1-sun AM1.5 illumination for all the organic dyes using different sensitization times.

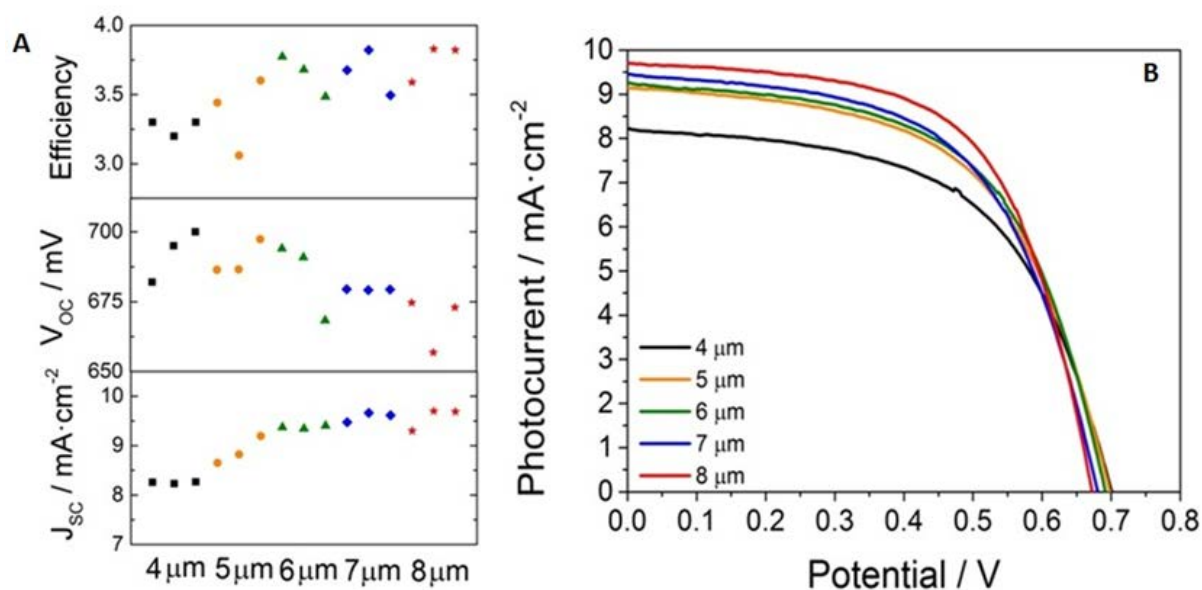


Figure S2: (A) Photovoltaic parameter (efficiency, open-circuit photovoltage and short-circuit photocurrent) for RK1-DSSCs using different thickness of photoanode. 3 samples have been measured. (B) Current-voltage for the best cell of each configuration. All DSSCs were characterized under 1-sun AM 1.5 illumination.

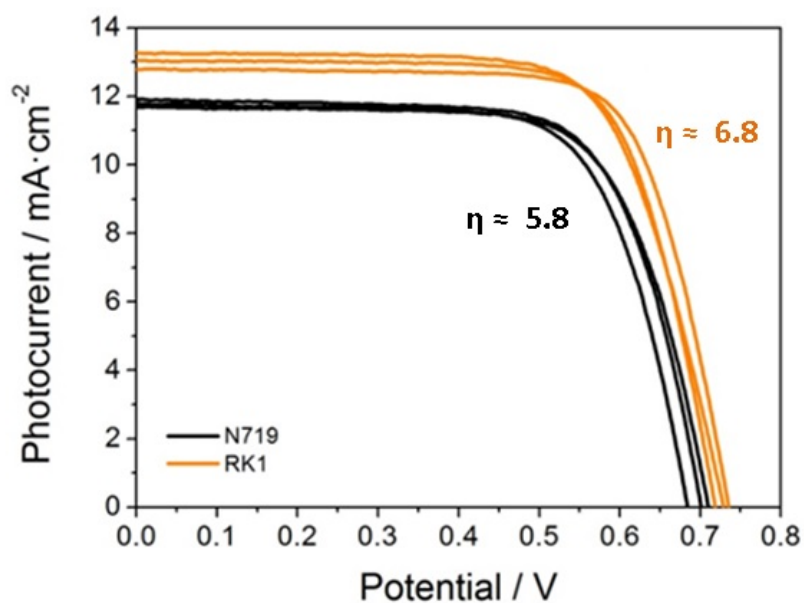


Figure S3: Current-voltage curves under 1 sun AM 1.5 illumination for RK1 and N719 using a 12 μm TiO_2 film as photoanode.

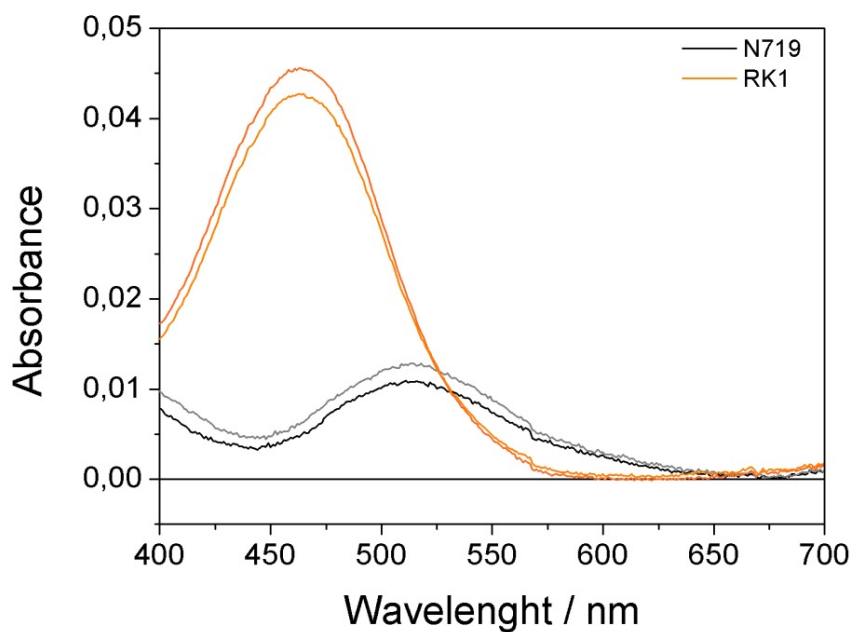


Figure S4: Absorbance spectra of solution (0.1M KOH in methanol) containing the desorbed dye. From these spectra, the following dye loadings have been calculated: $4.6 \cdot 10^{-8}$ moles/cm² and $2.7 \cdot 10^{-8}$ moles/cm² for RK1- and N719-photoanodes respectively.

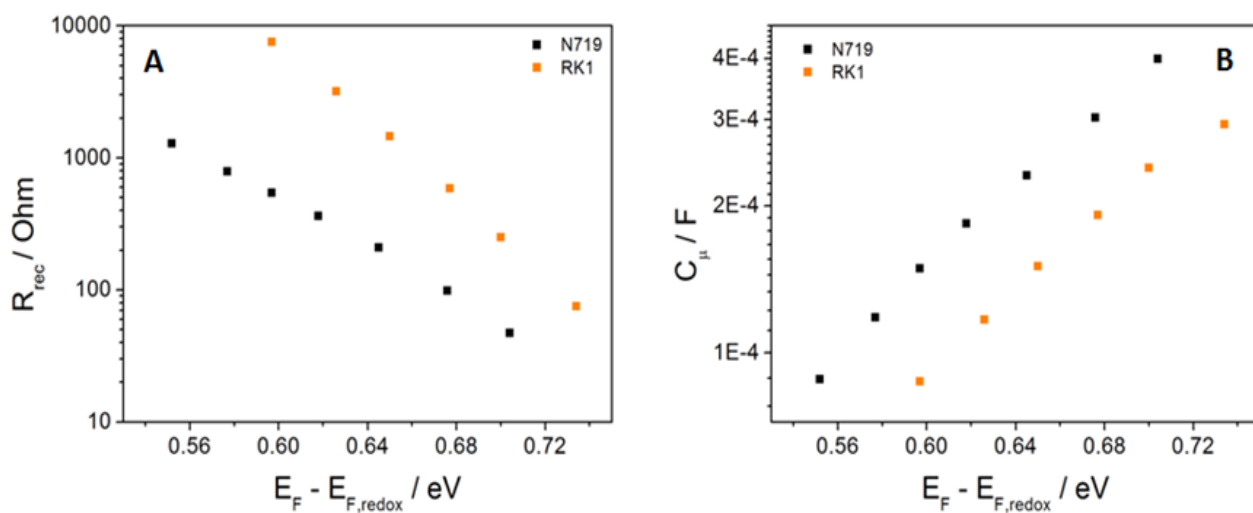


Figure 5: (A) Electron recombination resistance and (B) chemical capacitance data as extracted from EIS measurements in TiO₂-DSSC with RK1 and N719 as sensitizers.

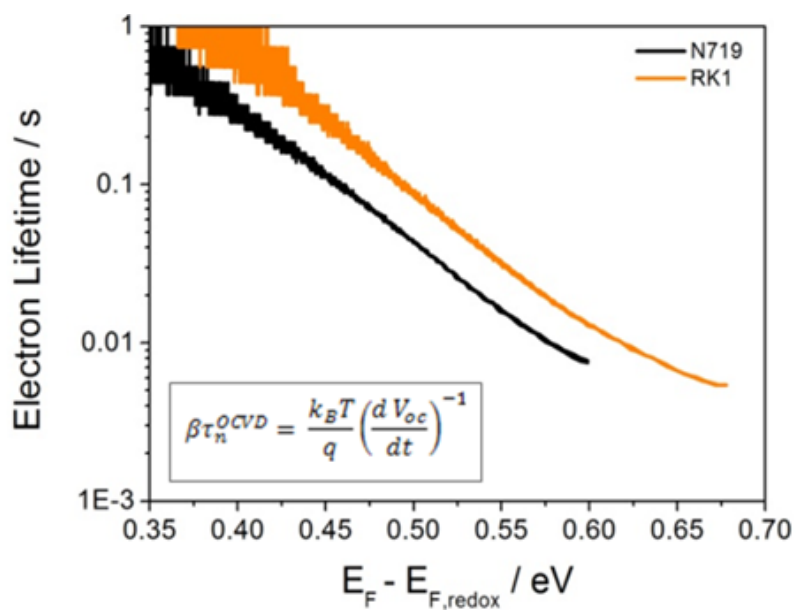


Figure S6: Electron lifetime as extracted from OCVD for N719-DSSC and RK1-DSSC.

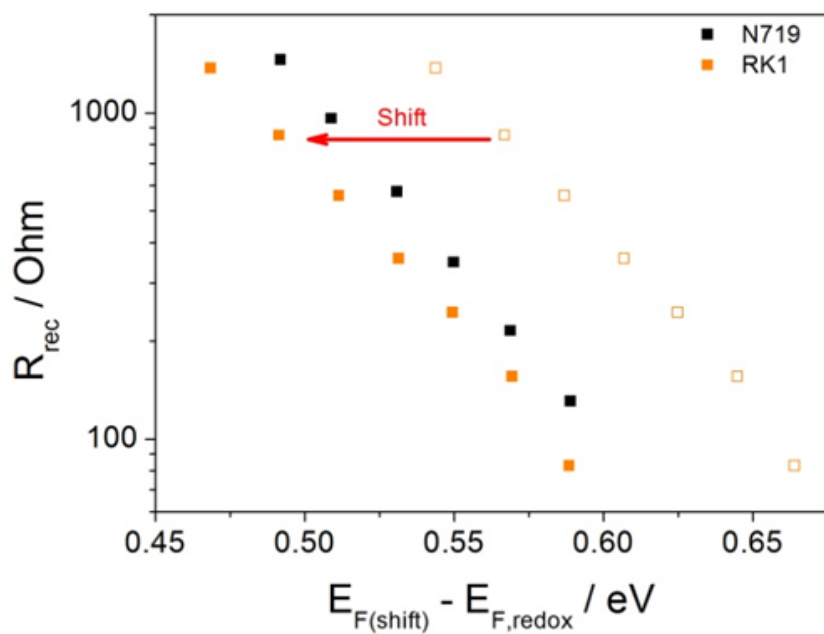


Figure S7: Electron recombination resistance data as extracted from EIS measurements for N719-DSSC and RK1-DSSC after (filled squares) and before (empty squares) applying a shift on the Fermi level (both sample show the same capacitance at the same electron density).

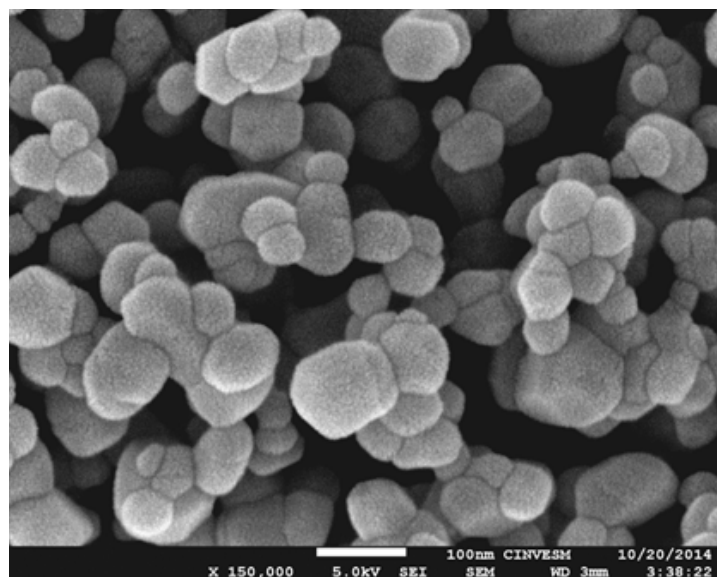


Figure S8: SEM picture of a sintered ZnO nanostructured film used as photoanode