Electronic Supplementary Information (ESI):

Photoinduced electron transfer in thin films of porphyrin-fullerene dyad and perylenetetracarboxidiimide

Paola Vivo[*,a] *Alexander S. Alekseev,*[b] *Kimmo Kaunisto,*[a] *Oili Pekkola,*[a] *Antti Tolkki,*[a] *Vladimir Chukharev,*[a] *Alexander Efimov,*[a] *Petri Ihalainen,*[c] *Jouko Peltonen,*[c] *and Helge Lemmetyinen*[a]

[a] Department of Chemistry and Bioengineering, Tampere University of Technology, P.O. Box 541, FI-33101 Tampere, Finland

[b] Prokhorov General Physics Institute, Russian Academy of Sciences, Vavilov St. 38, 119991 Moscow, Russia

[c] Center of Excellence for Functional Materials, Laboratory of Paper Coating and Converting, Åbo Akademi University, Porthaninkatu 3-5, FI-20500

Atomic Force Microscopy (AFM)

[*] To whom correspondence should be addressed. E-mail: paola.vivo@tut.fi. Phone: +358 (0)40 1981 128. Fax: +358 3 3115 2108.

AFM topographs show that both **P–F** and **PTCDI** form relative smooth and uniform films after deposition (Figure S1 and S2). However, the roughness analysis indicates that the **P–F** film is somewhat rougher compared to **PTCDI** film, resulting a slightly higher RMS-roughness and peak-to-peak distance values. This might be also the reason why randomly organized fine structure is much better resolved for **P–F** (Figure S1).

a) **Figures:**

b)

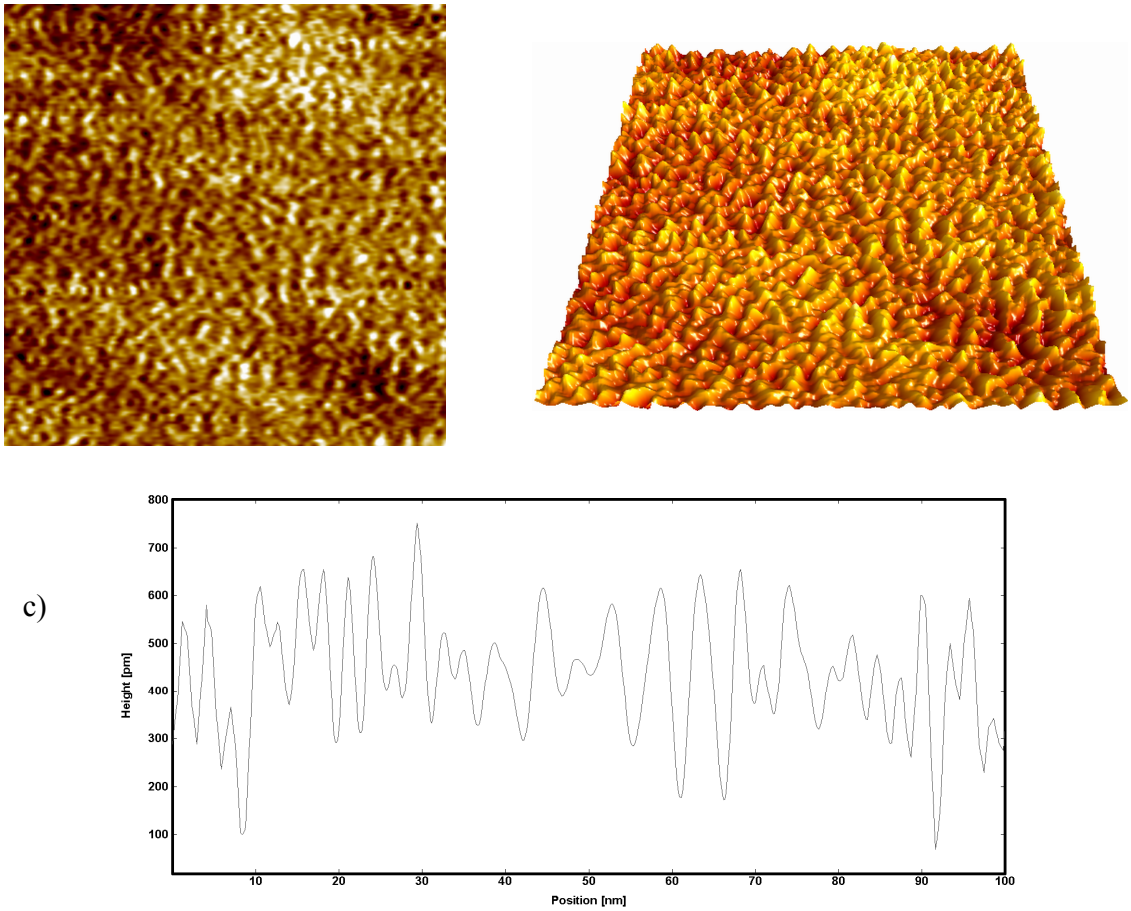
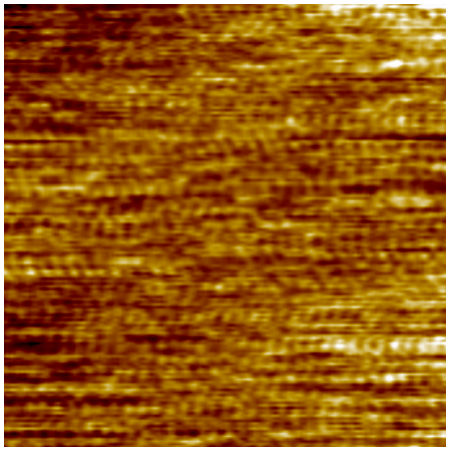
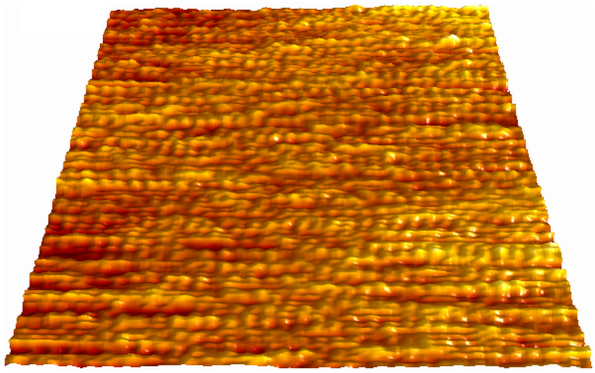


Figure S1. AFM images of the 100 mol% **P–F** LS film. (a) Topographic view (image size 100x100 nm^2) with dark-light height scale 0.7 nm. Root Mean Square (RMS) roughness is 0.108 nm. (b) Isometric view, with 5 x height scaling. (c) Line profile with average peak-to-peak distance 5 ± 1 nm.

a)



b)



c)

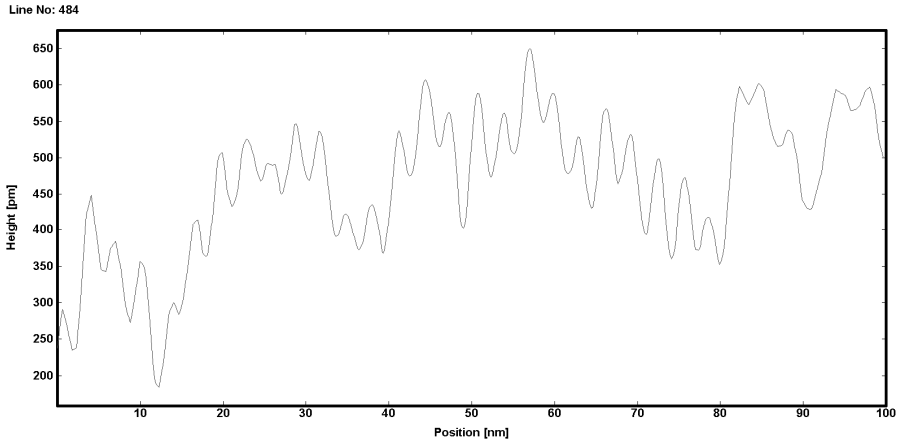


Figure S2. AFM images of the thermally evaporated **PTCDI** film. a) Topographic view (image size 100x100 nm^2), with dark-light height scale 0.7 nm. Root Mean Square (RMS) roughness is 0.097 nm. (b) Isometric view, with 5 x height scaling. (c) Line profile with average peak to peak distance 3.5 ± 0.5 nm.

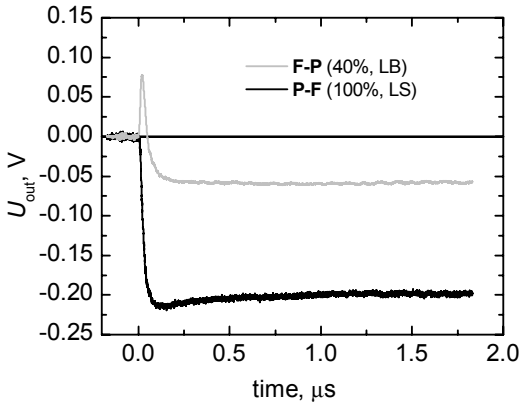


Figure S3. Photovoltage (PV) responses of **P–F** (100 mol% LS) and **F–P** (40 mol% LB). The signals are recorded by exciting the samples with 170 μJ/cm^2 energy density.

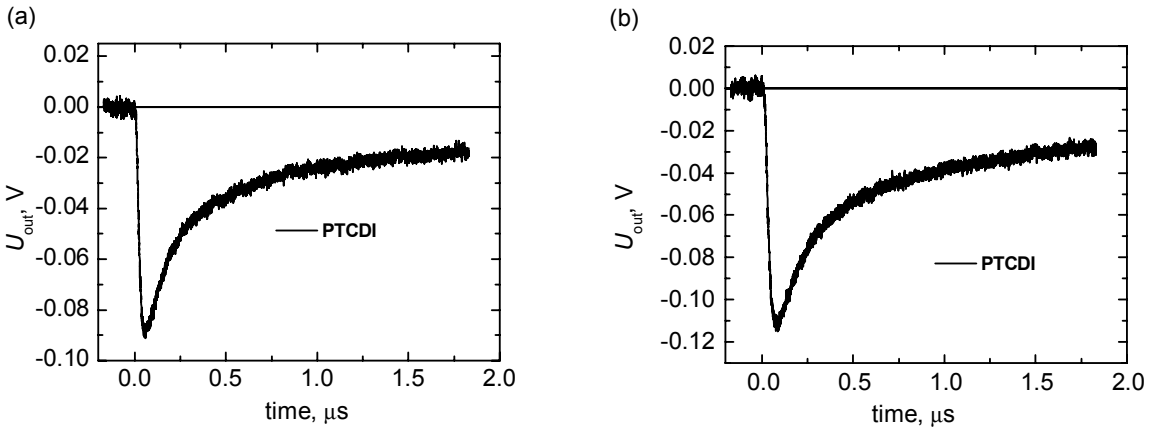


Figure S4. Photovoltage (PV) responses of thermally evaporated **PTCDI** (16 nm) at 430 nm excitation wavelength (a), and 532 nm excitation (b). The excitation energy density is 1.19 μJ/cm^2.

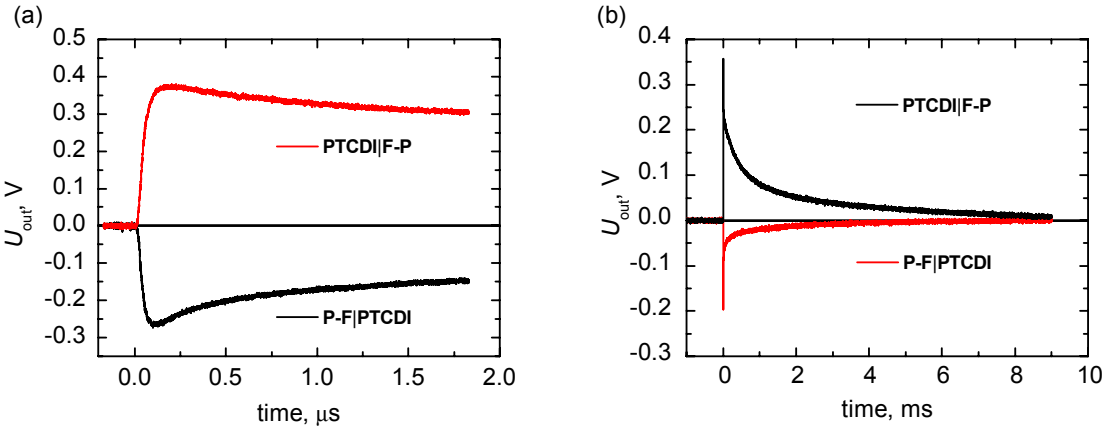


Figure S5. Photovoltage (PV) responses in short time scale up to 1.8 μs (a), and long time scale up to 9 ms (b) for the bilayer structures **P–F**|**PTCDI** and **PTCDI**|**F–P**. The excitation wavelength is 532 nm and the excitation energy density 0.33 μJ/cm^2.

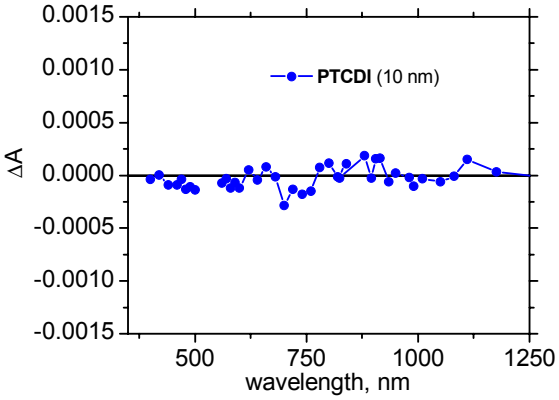


Figure S6. Time-resolved absorption spectrum of **PTCDI** film (thickness = 10 nm), at 5 μs after the excitation. The excitation wavelength is 532 nm and the excitation energy density is roughly 2 μJ/cm^2.

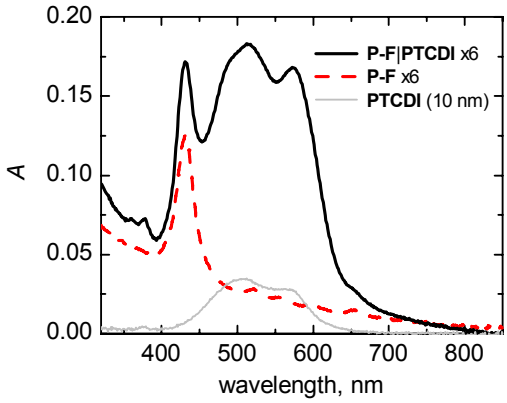


Figure S7. Absorption spectra of the three sample structures used in flash-photolysis experiments: **P–F** (6 LS), (**P–F** |**PTCDI**) x6, and **PTCDI** (10 nm).