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SUPPLEMENTARY INFORMATION

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Unification of trap-limited electron transport in semiconducting polymers

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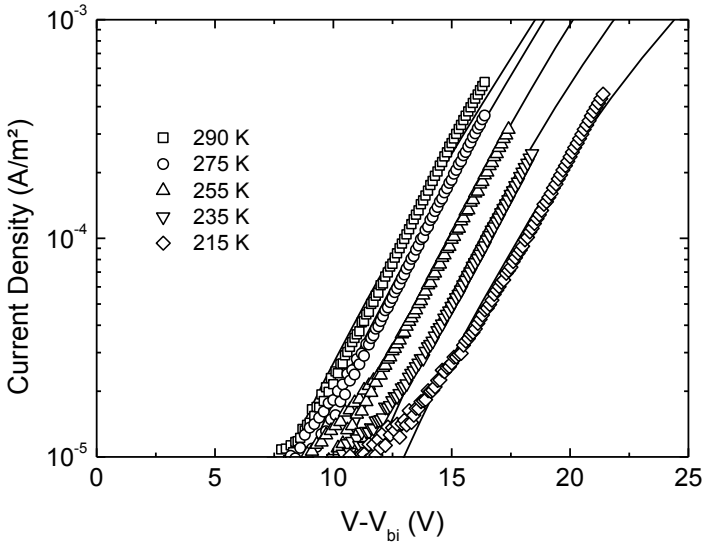

Figure S1. Temperature-dependent *J–V* curves of 320 nm NRS-PPV electron-only diodes and fits with a Gaussian trap at a trap depth of 0.76 eV.

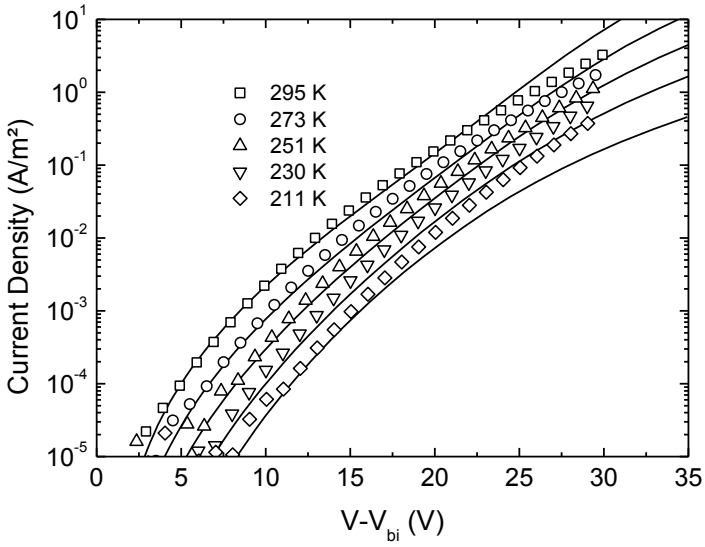

Figure S2. Temperature-dependent *J–V* curves of 300 nm OC_1C_{10}-PPV electron-only diodes and fits with a Gaussian trap at a trap depth of 0.70 eV.

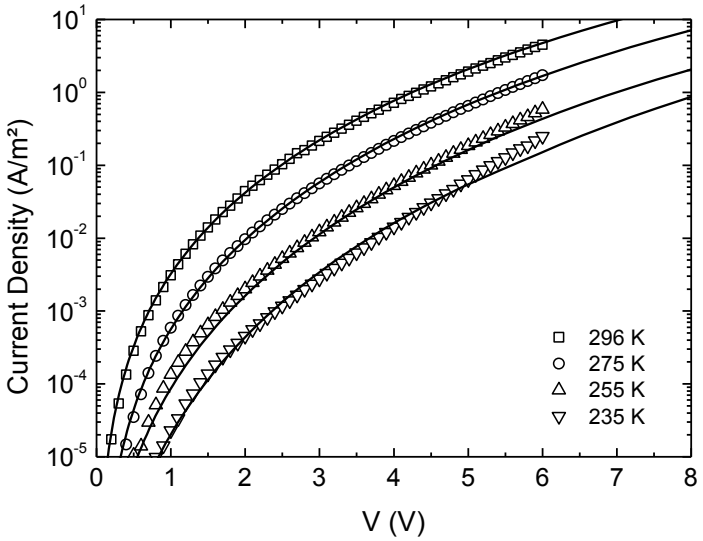

Figure S3. Temperature-dependent *J–V* curves of 173 nm F8BT electron-only diodes and fits with a Gaussian trap at a trap depth of 0.55 eV.

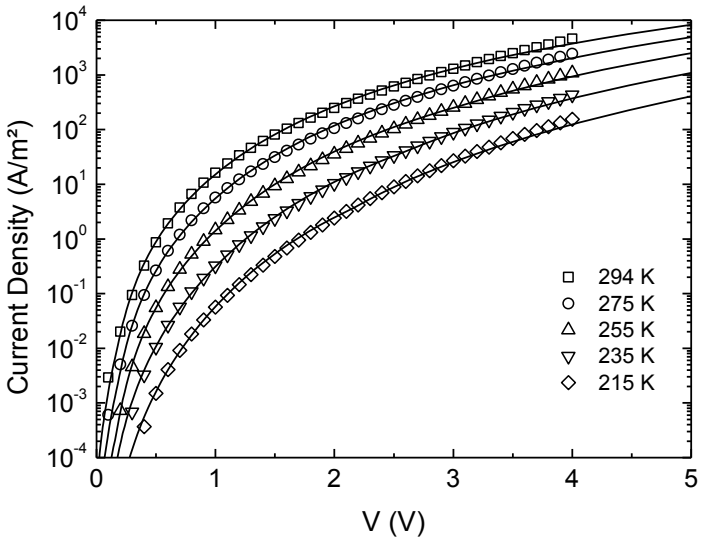

Figure S4. Temperature-dependent *J–V* curves of 85 nm PF10TBT electron-only diodes and fits with a Gaussian trap at a trap depth of 0.34 eV.

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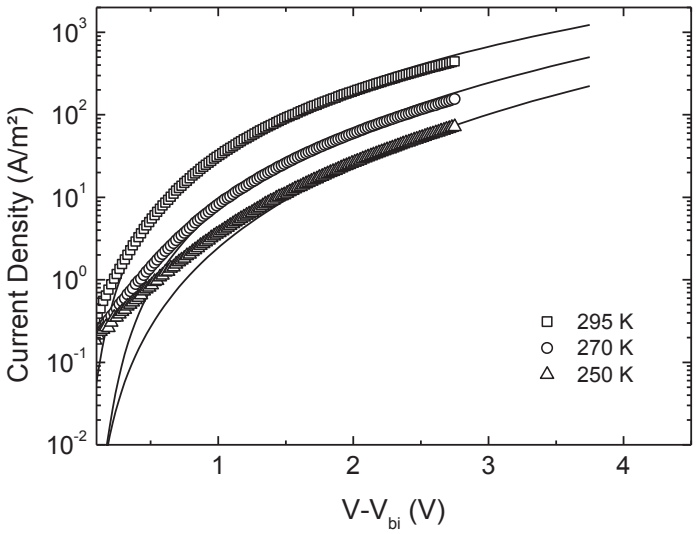
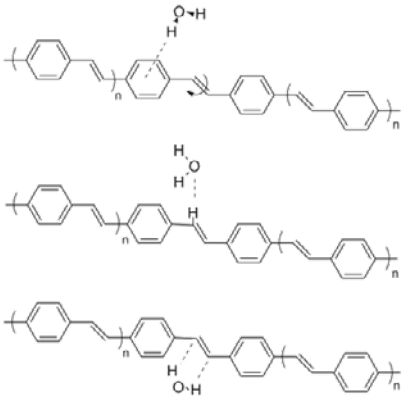


Figure S5. Temperature-dependent *J–V* curves of 148 nm PCPDTBT electron-only diodes and fits with a Gaussian trap at a trap depth of 0.21 eV.

Table S1. Frontier molecular orbital energies and vertical electron affinities for the H_2O-PPV complexes as determined at the B97D/6-311++G** level of theory with the CPCM dielectric model (ε = 3.0).



	HOMO (eV)	LUMO (eV)	VEA (eV)
Stilbene	-5.18	-2.42	-1.57
PPV4	-4.74	-2.91	-2.35
PPV6	-4.62	-3.05	-2.62
A2	-5.36	-2.57	-1.71
A4	-4.84	-3.01	-2.44
A6	-4.69	-3.12	-2.68
B2	-5.05	-2.30	-1.46
B4	-4.67	-2.84	-2.28
B6	-4.56	-3.00	-2.57
C2	-5.33	-2.58	-1.73
C4	-4.83	-3.01	-2.44
C6	-4.68	-3.13	-2.68

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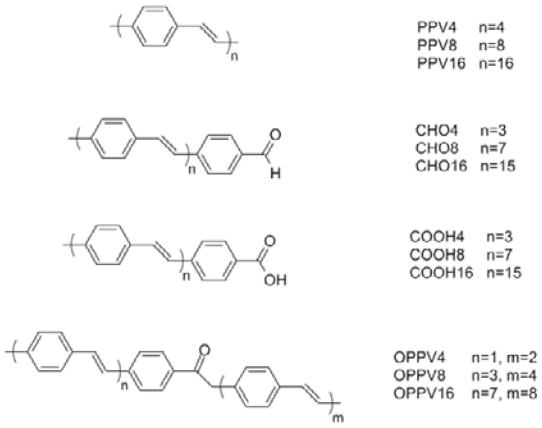
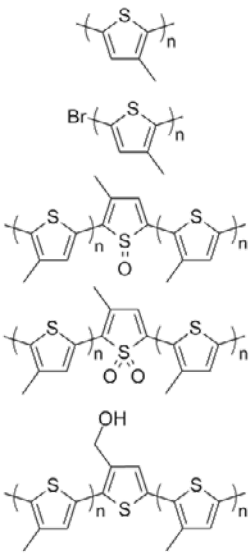
Table S2. Frontier molecular orbital energies and vertical electron affinities for select poly(paraphenylenevinylene) photooxidation products as determined at the B97D/6-311G**//AM1 level of theory with the CPCM dielectric model (ε = 3.0).



	HOMO (eV)	LUMO (eV)	VEA (eV)
PPV4	-4.72	-2.97	-2.44
PPV8	-4.57	-3.12	-2.78
PPV16	-4.51	-3.18	-2.97
OPPV4	-5.07	-3.08	-2.38
OPPV8	-4.69	-3.19	-2.74
OPPV16	-4.55	-3.23	-2.97
CHO4	-4.88	-3.25	-2.68
CHO8	-4.61	-3.28	-2.91
CHO16	-4.52	-3.28	-3.04
COOH4	-4.85	-3.13	-2.59
COOH8	-4.60	-3.20	-2.85
COOH16	-4.52	-3.22	-3.01

Table S3. Frontier molecular orbital energies and vertical electron affinities for bromine-terminated poly(thiophene) and select poly(thiophene) photooxidation products and bromine termination as determined at the B97D/6-311G**//AM1 level of theory with the CPCM dielectric model (ε = 3.0).



	HOMO (eV)	LUMO (eV)	VEA (eV)
Thiophene7	-4.04	-2.40	-1.88
Thiophene13	-3.92	-2.52	-2.16
Thiophene25	-3.88	-2.57	-2.34
Br7	-4.06	-2.45	-1.94
Br13	-3.93	-2.54	-2.19
Br25	-3.88	-2.58	-2.36
SO7	-4.22	-2.87	-2.27
SO13	-4.03	-2.88	-2.41
SO25	-3.92	-2.88	-2.50
SOO7	-4.28	-3.05	-2.43
SOO13	-4.06	-3.04	-2.53
SOO25	-3.93	-3.04	-2.59
SOH7	-4.05	-2.41	-1.89
SOH13	-3.93	-2.52	-2.17
SOH25	-3.88	-2.57	-2.35

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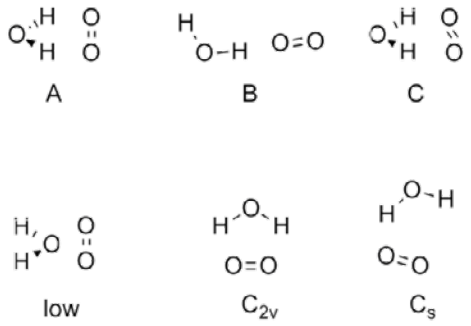
Table S4. Frontier molecular orbital energies and vertical electron affinities for select hydrated oxygen complexes as determined at the B97D/6-311++G** and MP2/6-311++G** levels of theory with the CPCM dielectric model. The complex geometries were taken from Bell, A. J. & Wright, T. G., *Phys. Chem. Chem. Phys.* **6**, 4385-4390 (2004) and Gomes, J. A. G. *et al., Spectrochim. Acta, Part A* **61**, 3082-3086 (2005).



	ε = 1.0			ε = 3.0		
	HOMO (eV)	LUMO (eV)	VEA (eV)	HOMO (eV)	LUMO (eV)	VEA (eV)
*B97D/6-311++G***						
A	-7.20	-0.74	-0.49	-7.21	-0.60	-2.13
B	-7.20	-0.74	-0.53	-7.22	-0.60	-2.15
C	-7.20	-0.73	-0.48	-7.20	-0.59	-2.12
low	-7.20	-0.74	-0.49	-7.21	-0.60	-2.13
C_{2v}	-7.24	-0.77	-0.51	-7.24	-0.61	-2.14
C_s	-7.19	-0.76	-0.57	-7.24	-0.60	-2.17
*MP2/6-311++G***						
A	-13.84	1.44	1.43	-13.95	1.52	0.18
B	-13.80	1.35	1.28	-13.93	1.44	0.02
C	-13.84	1.44	1.43	-13.95	1.52	0.18
low	-13.88	1.19	1.15	-13.91	1.35	-0.03
C_{2v}	-13.87	1.49	0.14	-13.95	1.54	-1.54
C_s	-13.59	1.49	-0.80	-13.75	1.58	-2.77