Supporting Information

Panchromatic Light Harvesting by N719 with a Porphyrin Molecule for High-Performance Dye-Sensitized Solar Cells

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Supporting Characterizations

Table S1 Absorption wavelength, fluorescence maxima and porphyrin redox potentials of HD 18 in THF

Dyes	Absorption/λ_{max}/nm (ε,$\times 10^5$M^{-1} cm^{-1})	Emission λ_{max} /nm[a]	E_{ox} /V[b]	E_{0-0} /V[c]	E_{re} /V[d]
HD18	456(1.67), 666(0.47)	679	+0.59, +0.80	1.74	-1.15

[a] Excitation wavelengths /nm: HD18, 456. [b] HOMO level was measured in THF with 0.1 M tetrabutylammonium hexafluorophosphate (TBAPF$_6$). [c] E_{0-0} was estimated from the absorption threshold of dye in THF. [d] The LUMO was calculated using the equation LUMO = HOMO - E_{0-0}.
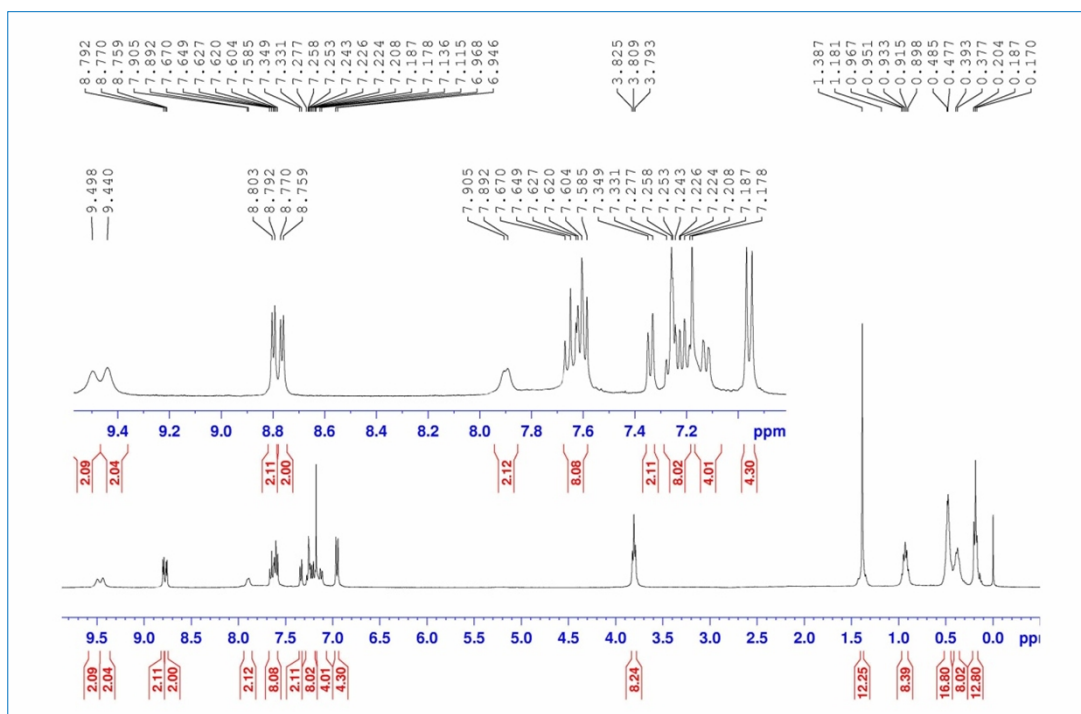
Fig. S1 ^{1}H NMR spectraum of HD18.

Date of acquisition	2014-01-28 15:42:33
Comment 3	Theoretical Value: 1569.7058
Instrument type	autoflex
Serial instrument number	25001.00216
PIE delay in [ns]	120 nsec
Voltage polarity	POS
Comment 1	M + Found: 1569.7100
Comment 2	Error: 2.6495 ppm
Laser repetition rate in Hz	20 psec
Linear detector voltage	1.836
Ion source voltage 1	19
Ion source voltage 2	17.18
Ion source lens voltage	8.100000400000001
Mass calibration Constant 1	728065.9450511484
Mass calibration Constant 2	142.8678153617439
Third calib constant	-0.006567944716701982
Number of shots	500

Acquisition method name   D:\Old Method & Data upto 15-7-2007\methods upto 15-7-2007\David-Methods\New Folder\RP_PepMix 6-9-2012.par
Sample name (file name prefix) Wonghongda SA\0_A7\1

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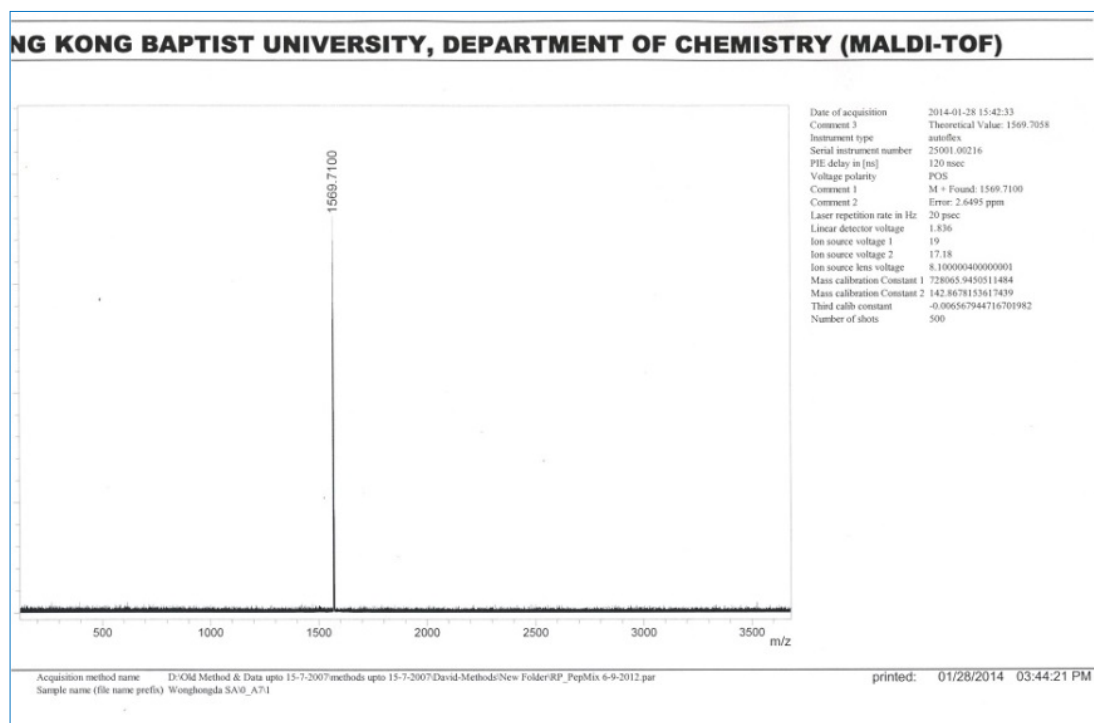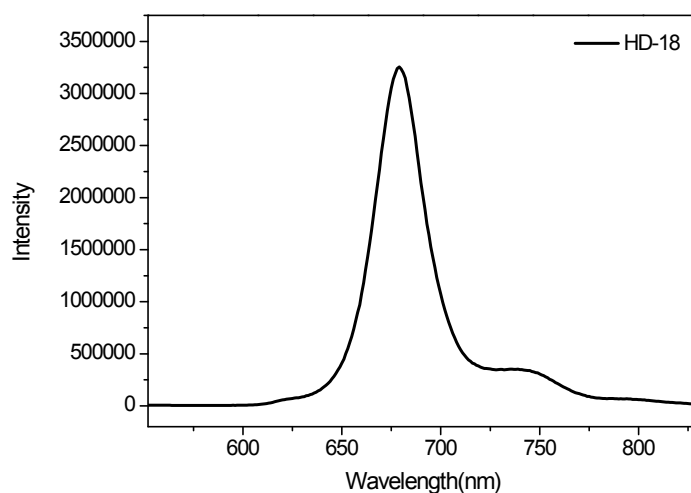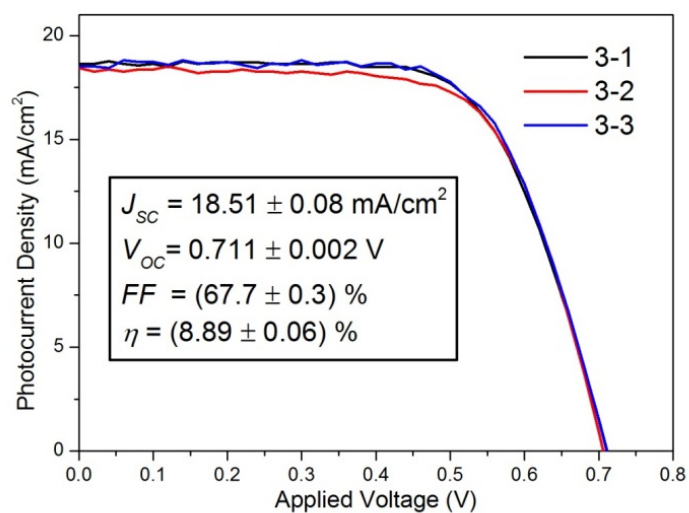**Fig. S2** ESI-HRMS of HD18.

Fig. S3 Fluorescence spectra of HD18 measured in THF. Experimental conditions:1×10^{-6} M.

Fig. S4 Three identical co-sensitized devices denoted as 3-1, 3-2 and 3-3. The inset chart gives their average J_{sc}, V_{oc}, fill factor (FF) and PCE (η) parameters with the margin of error.

Table S2. Simulated device parameters from the EIS data in Fig. 3a in main text

Device	$R_{CT}(\Omega)$	f(Hz)	τ(ms)
1	52.2	32.56	4.89
2	196.4	10.30	15.45
3	142.1	13.01	12.23