

## Supporting Information

### Ferrocene-diketopyrrolopyrrole based small molecule donor for bulk heterojunction solar cells

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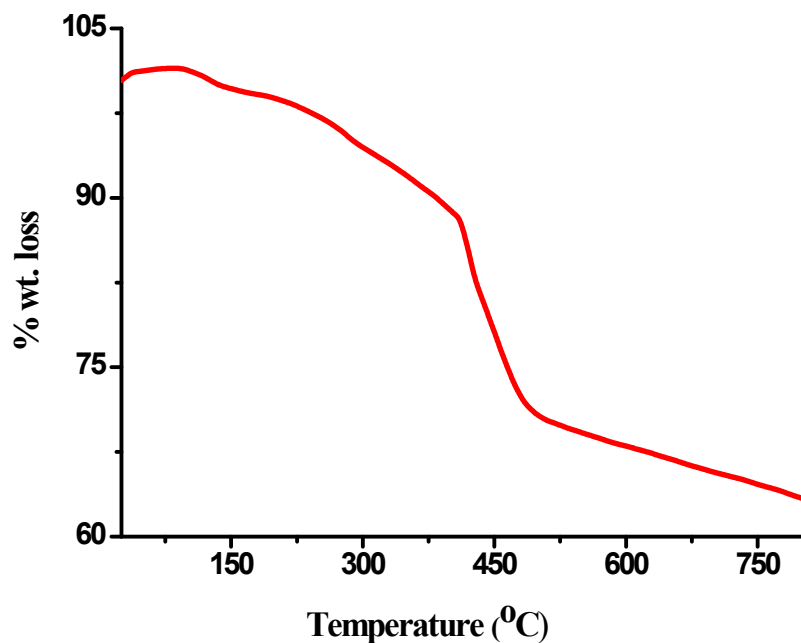
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### Experimental details

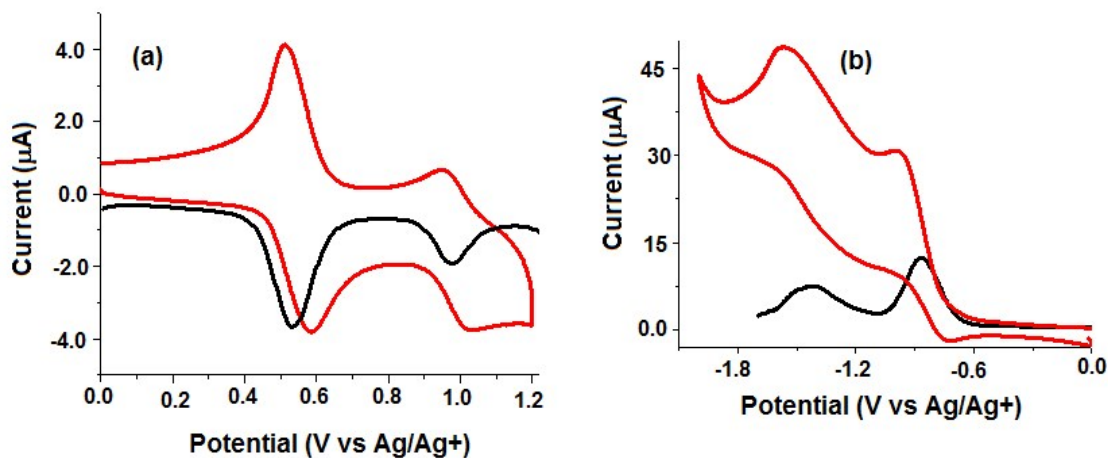
#### Device fabrication and characterization

The photovoltaic devices was prepared by spin-casting the blend solution on ITO/PEDOT:PSS substrate. Approximately a 30 nm poly(3,4-ethylenedioxythiophene):poly(styrenesulfonate) (PEDOT:PSS) layer was spin-coated onto the pre-cleaned indium tin oxide (ITO) glass followed by thermal annealing at 110 °C for 10 min under ambient conditions. With active layers, **Fc-DPP-Fc**:PC<sub>71</sub>BM (different weight ratios) was made by spin coating THF solution with the total concentration of 13 mg/mL. For the SA, the **Fc-DPP-Fc**:PC<sub>71</sub>BM (1:2) was deposited from the DIO (3 v%)/THF solution. All the films were dried at room temperature for 2 hr. For two step annealing, the DIO (3 v%)/THF cast film was thermally annealed at 110 °C for 10 min. A thin layer of PFN deposited on the top of active layers. Finally, 10 nm Al layer was deposited on the top of PFN layer, under high vacuum ( $<2 \times 10^{-5}$  Pa). The effective area of the devices was about 16 mm<sup>2</sup>. All devices were fabricated and tested in an ambient atmosphere without encapsulation. The hole-only and electron-only devices with ITO/PEDOT:PSS/active layer /Au and ITO/Al/ active layer/Al architectures were also fabricated in a similar way, in order to measure the hole and electron mobility, respectively. The current–voltage (J–V) characteristics of the BHJ organic solar cells were measured using a computer controlled Keithley 2400 source meter in the dark and under a simulated AM 1.5G illumination of 100 mW/cm<sup>2</sup>. A xenon light source coupled with the optical filter was used to give the stimulated irradiance at the surface of the devices. The incident photon to current efficiency (IPCE) of the devices was measured

illuminating the device through the light source and the monochromator and the resulting current was measured using a Keithley electrometer under short circuit conditions.



**Fig. S1** Thermogravimetric analysis of **Fc-DPP-Fc** measured at a heating rate of 10 °C / min under nitrogen atmosphere.



**Fig. S2** CV (red line) and DPV (black line) plots of (a) oxidation and (b) reduction for **Fc-DPP-Fc**.

