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Supporting information

Fully spray-coated organic solar cells on woven polyester cotton fabric for wearable energy harvesting applications

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Fabrication of OSCs on glass and fabric substrates using spin coating and evaporation methods

Device type 5 was fabricated with a conventional structure of Glass/ITO/PEDOT:PSS/P3HT: ICBA/Calcium(40nm)/Aluminium(40nm), using a spin coating process for depositing hole-collecting layer and donor-acceptor blend. The 100 nm thick layer of ITO coated glass substrates (1.5x1.5cm^2) were cleaned in an ultrasonic bath with acetone, and isopropyl alcohol for 5 minutes and then dried by a nitrogen flow. A thin hole collecting layer of poly(ethylenedioxythiophene)poly(styrenesulfonate) (PEDOT:PSS), was spin coated at 4000 rpm onto the ITO/glass substrate. After baking at 120 ^{o}C for 20 minutes in ambient air, the substrates were then transferred into a nitrogen-filled glove box for the OSCs device processing and characterisations. The donor-acceptor (P3HT: ICBA) were deposited by spin-coating method at 800 rpm and subsequently annealed at 135 °C for 30 minutes. Finally, a 40 nm of calcium (ca) and 40 nm of aluminium (Al) layer were deposited on the active layer under high vacuum condition (2×10^{-6} mbar). When a fabric solar cell (Device type 4) structure is considered, the bottom electrode is placed onto the textile substrate. A 100 nm of aluminium layer was thermally evaporated onto fabric substrate in order to substitute bottom ITO electrode. Therefore, light has to come through the upper electrode of the cells. To allow light transmission through top electrode onto the fabric solar cell active layer, top electrode layer of Ca/Al, 10 nm each, were thermally evaporated.

Devices	**Device configuration**	**V_{OC} (V)**	**FF**	**J_{SC} (mA/cm^2)**	**PCE (%)**	**R_S (KΩ)**	**R_{SH} (KΩ)**
Type 4	IF Fabric/Al/PEDOT: PSS/P3HT:ICBA/Ca/Al	0.74	0.26	0.02	$5x10^{-3}$	39.7	47.9
Type 5	Glass/ITO/PEDOT: PSS/P3HT:ICBA/Ca/Al	0.77	0.63	9.3	4.5	1.67	1.52

Table SI1 Organic solar cells (OSCs) on both glass and fabric substrates by spin-coating and thermal evaporation method.

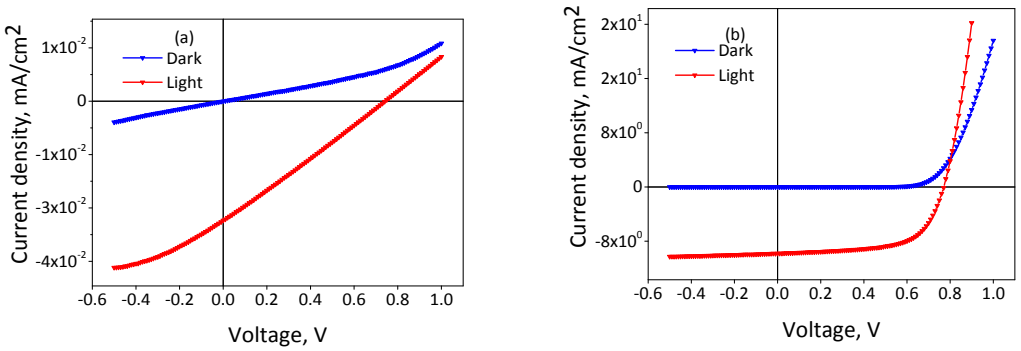

Figure SI1 J/V curves of organic solar cells on (a) fabric substrate and (b) Conventional architecture of OSCs on glass substrate by spin coating and thermal evaporation method.