

## Supporting Information

### Ternary composite of polymer, fullerene and fluorinated multi-walled carbon nanotubes as the active layer of organic solar cells

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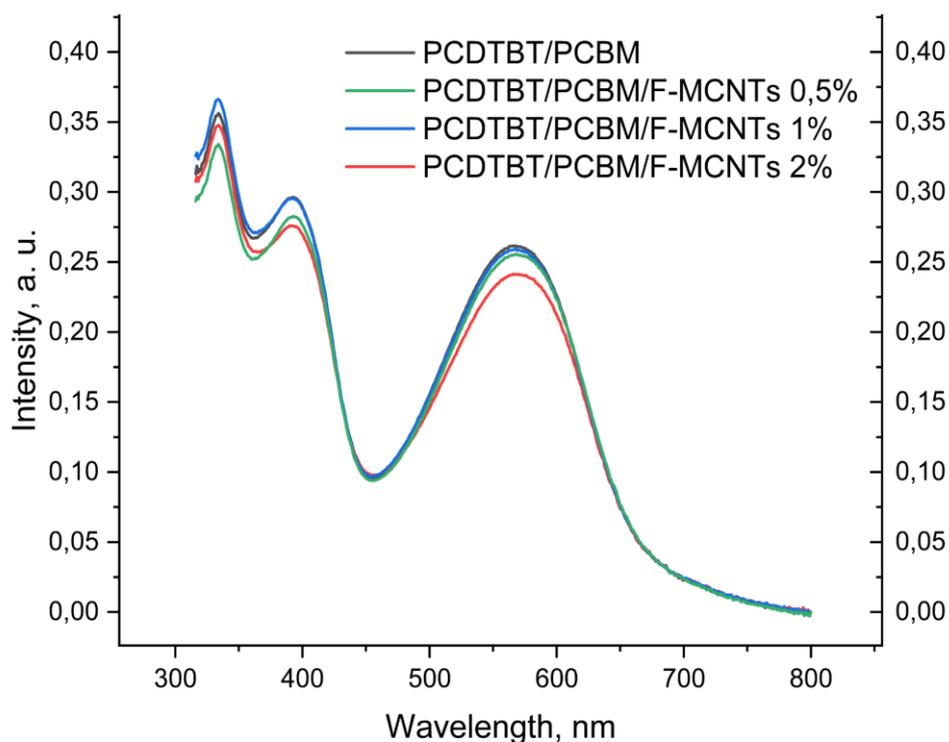
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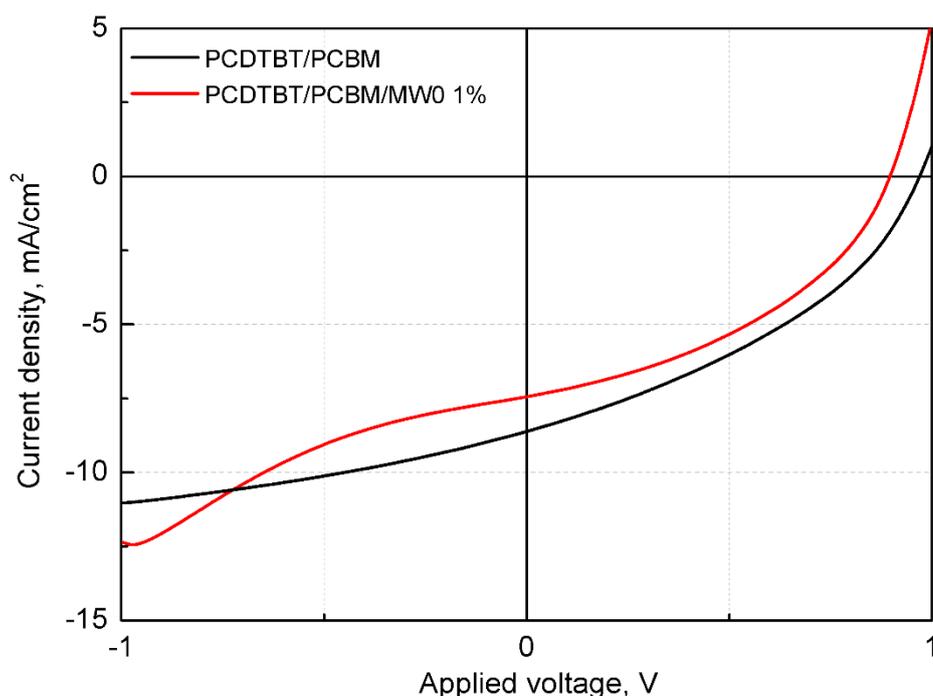
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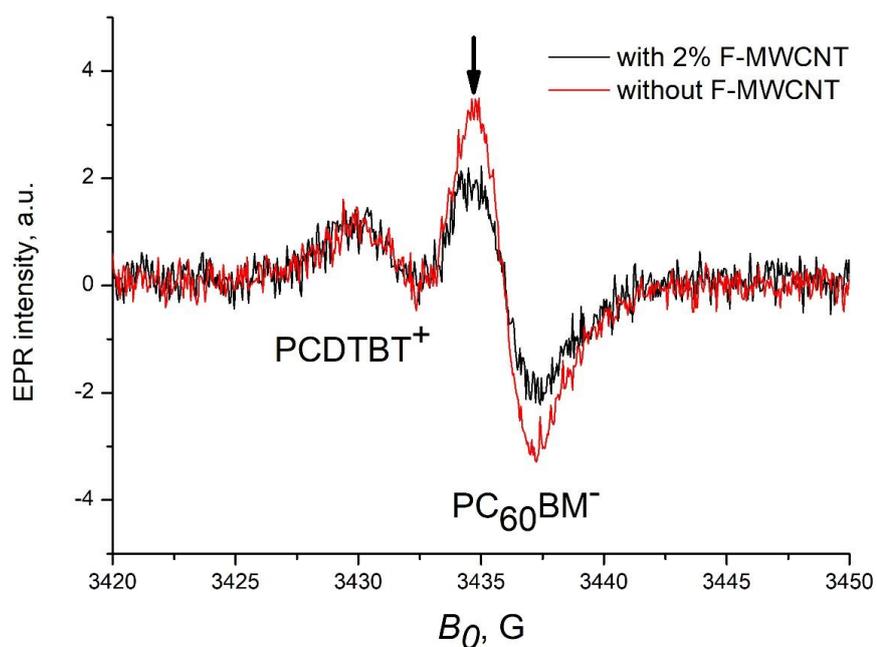
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**Figure S1.** UV/Vis absorption spectra of PCDTBT:PC<sub>60</sub>BM films with different amount of F-MWCNT additive. The films were cast from chlorobenzene on the glass plates.



**Figure S2.** Current density-voltage characteristics of the organic solar cell devices with architecture ITO/PEDOT:PSS/Active layer/LiF/Al with MW0 additive (red) and without additives.



**Figure S3.** Light-minus-dark EPR spectra of PCDTBT/PC<sub>60</sub>BM (red line) and PCDTBT/PC<sub>60</sub>BM/F-MWCNTs 2% (black line) composites. Temperature 85 K, modulation amplitude 3 G, microwave power 6.3 mW. The arrow marks the spectral position at which LEPR traces were recorded.

**Table S1.** Initial photovoltaic parameters of solar cells with architecture ITO/PEDOT:PSS/Active Layer/Au (before photodegradation).

	<i>V<sub>oc</sub></i> , V	<i>J<sub>sc</sub></i> , mA/cm <sup>2</sup>	<i>FF</i> , %	PCE, %
PCDTBT/PC <sub>60</sub> BM	0.39	7.1	28.5	0.77
	0.38 ± 0.01	6.8 ± 0.3	28.4 ± 0.2	0.74 ± 0.10
PCDTBT/PC <sub>60</sub> BM/F-MWCNTs 0.5%	0.46	12.4	29.5	1.66
	0.45 ± 0.01	12.1 ± 0.4	29.5 ± 0.2	1.61 ± 0.10
PCDTBT/PC <sub>60</sub> BM/F-MWCNTs 1%	0.43	11.4	28.7	1.41
	0.39 ± 0.01	10.0 ± 0.5	27.2 ± 0.6	1.05 ± 0.25
PCDTBT/PC <sub>60</sub> BM/F-MWCNTs 2%	0.44	12.4	30.6	1.68
	0.43 ± 0.02	10.7 ± 1.5	30.3 ± 0.4	1.39 ± 0.5
PCDTBT/PC <sub>60</sub> BM/MWCNTs 1%	0.45	13.2	32.7	1.94
	0.44 ± 0.01	13.0 ± 0.3	31.8 ± 0.8	1.83 ± 0.2