

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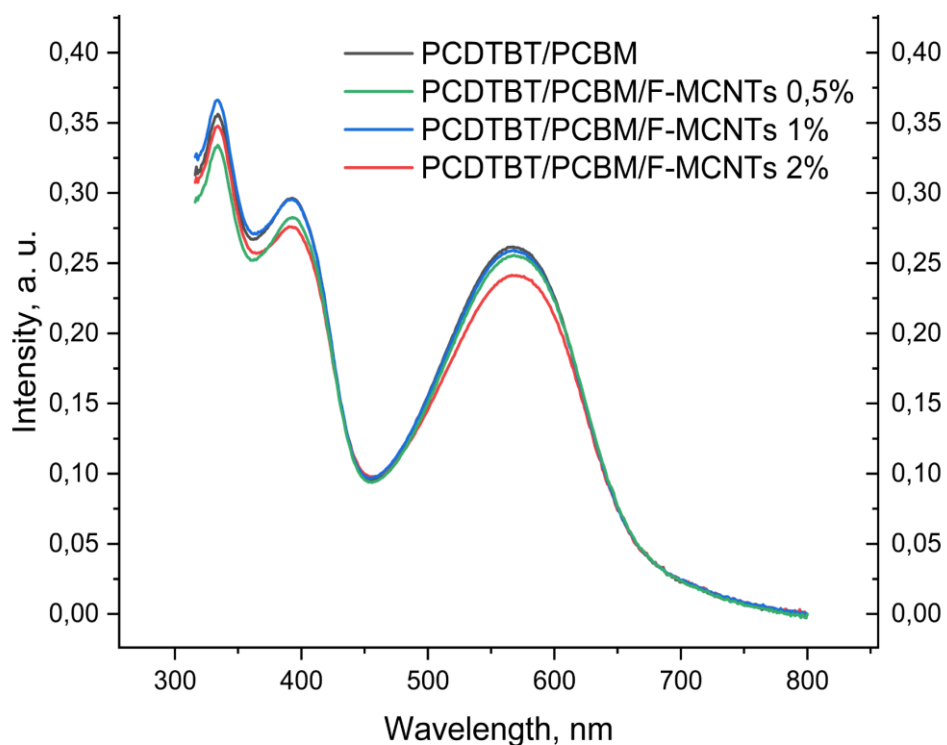
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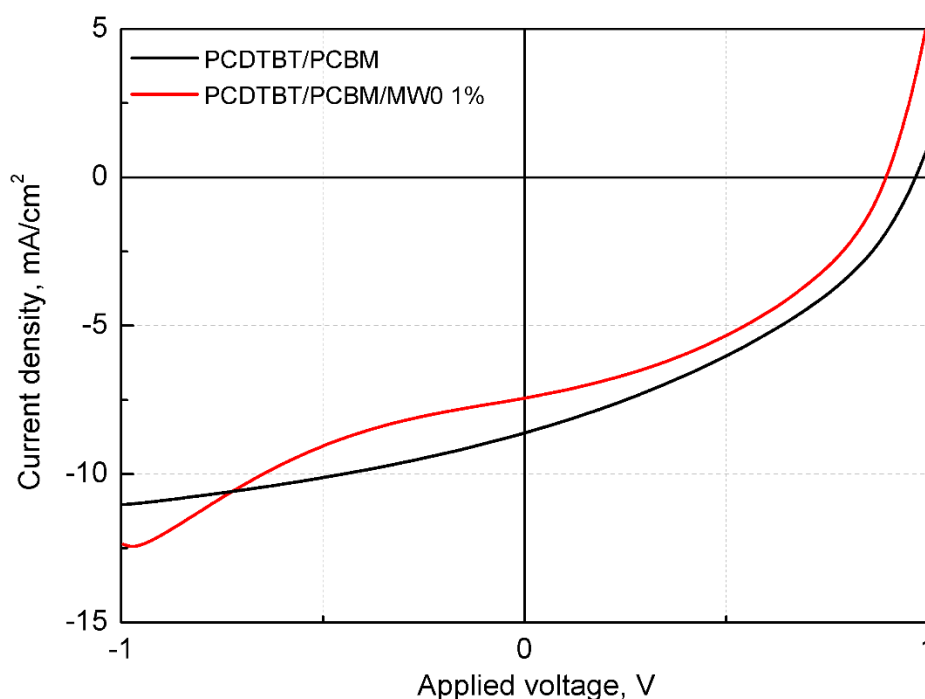
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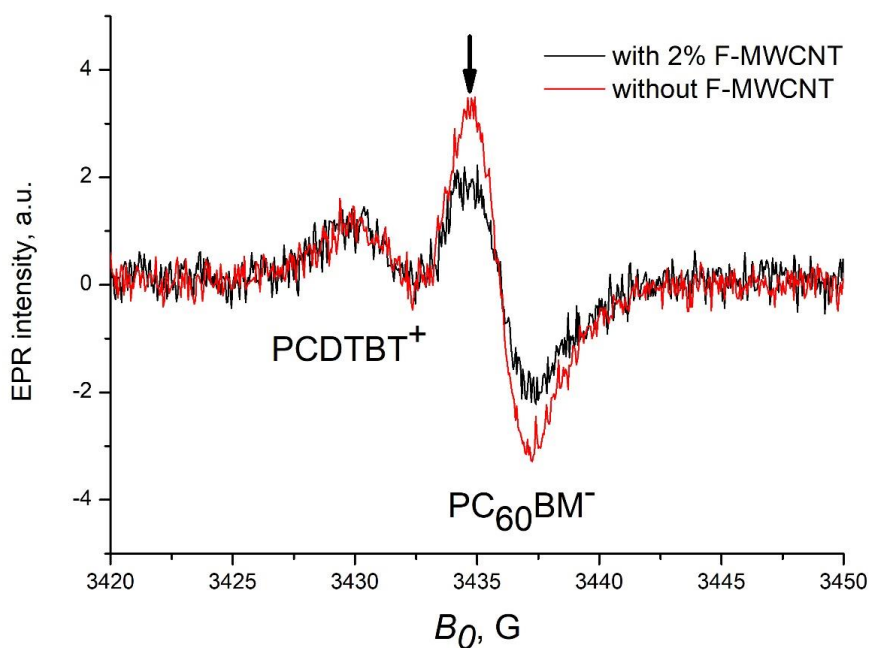
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**Figure S1.** UV/Vis absorption spectra of PCDTBT:PC<sub>60</sub>BM films with different amount of F-MWCNT additive. The films were cast from chlorobenzene on the glass plates.



**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).

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