Supporting Information

Efficient ultrathin organic solar cells with sustainable β-carotene as electron donor

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Number of pages: 3

Number of figures: 2

Number of tables: 1

Table of Contents:

I. Photovoltaic properties of inverted OSCs prepared using CF as a deposition solvent:

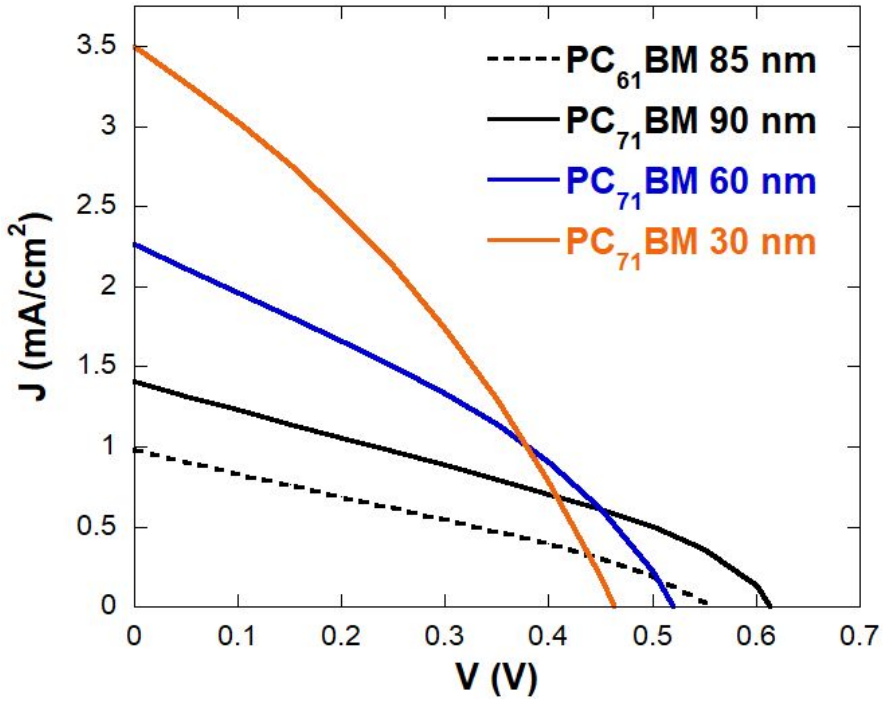

Figure S1. J-V curves OSCs fabricated with CF as the deposition solvent and with active layer thickness around 90 nm (black), 60 nm (blue) and 30 nm (orange). The dashed and solid black curves correspond to OSCs prepared with $PC_{61}BM$ and $PC_{71}BM$ as the electron acceptor, respectively.

II. Optoelectronic properties of thin active layers prepared with various deposition solvents

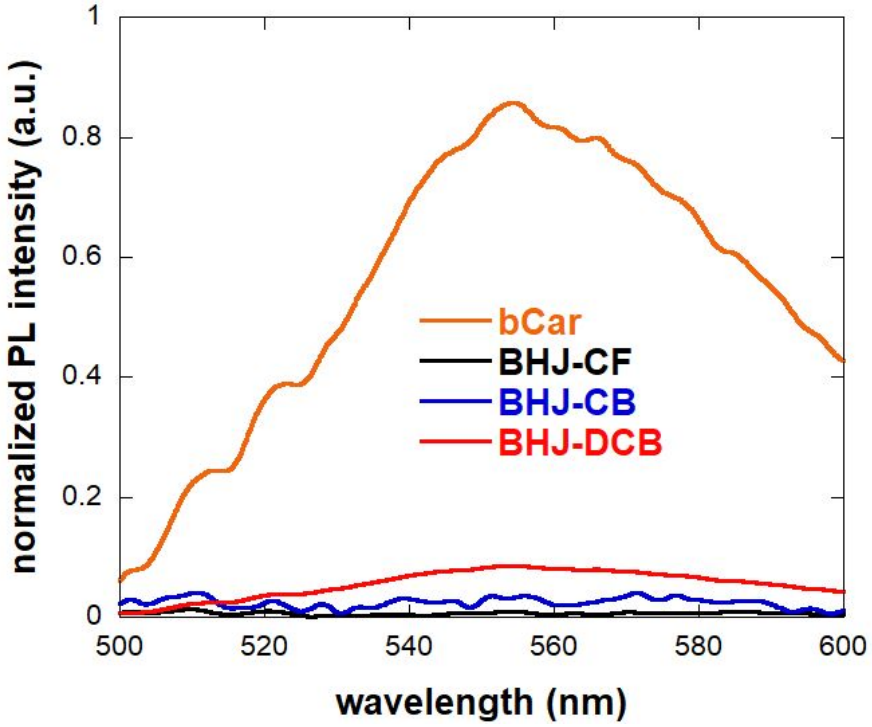

Figure S2. PL spectra of bCar, BHJ-CF, BHJ-CB and BHJ-DCB excited and normalized to their absorption at 450 nm.

Table S1. Impact of processing solvent on the properties of ultrathin (~30 nm) active layers.

Solvent	bCar PLQR* (%)	Jsc (mA/cm^2)	Voc (V)	FF (%)	PCE (%)
CF	99	3.51	0.46	32.9	0.53±0.01
CB	97	3.27	0.51	34.8	0.58±0.02
DCB	90	2.64	0.51	33.3	0.45±0.02

* bCar PL quenching ratio calculated using the integrations of the PL spectra displayed in **Figure S2** between 520 nm and 600 nm