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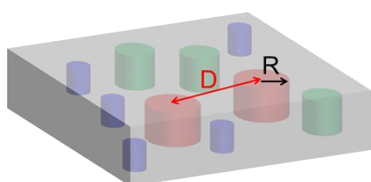
Investigation of Morphological Degradation of P3HT:PCBM Bulk Heterojunction Films Exposed to Long-Term Host Solvent Vapor

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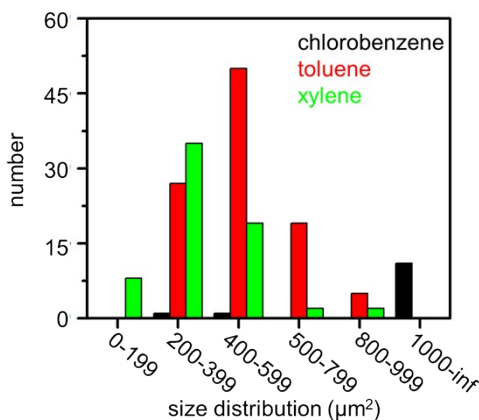
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Electronic Supplementary Information



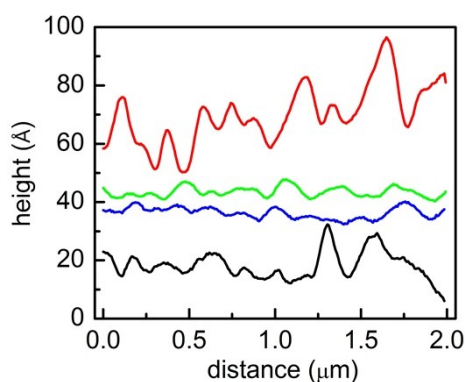
10 **Fig. S1** Nano morphological sketch of the P3HT:PCBM BHJ layer. Three types of cylinder form factors are indicated by red, green and blue colors. The center-to-center distance and the radius are labeled as D and R for the largest structure as an example.



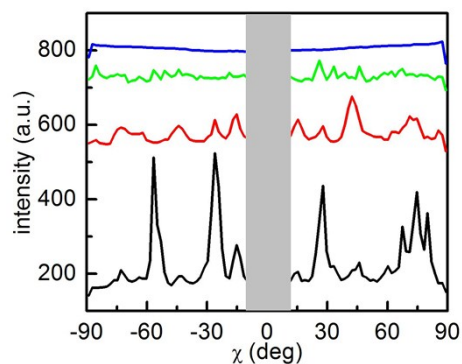
15 **Fig. S2** Size distribution of PCBM aggregates estimated from optical microscopy images within the detected area ($1.02 \times 0.82 \text{ mm}^2$).

20 **Table S1** Numbers and area fractions of PCBM aggregates in P3HT:PCBM films aging in chlorobenzene, toluene and xylene vapor obtained from optical microscope images.

| solvent | number of aggregates | area fraction |
|---------------|----------------------|---------------|
| chlorobenzene | 12 | 4.9 % |
| toluene | 101 | 3.8 % |
| xylene | 65 | 1.8 % |



25 **Fig. S3** Selected cross sections of the AFM topography data ($2 \times 2 \mu\text{m}^2$) of P3HT:PCBM films post-treated with chlorobenzene (black), toluene (blue), xylene (green) and dichlorobenzene (red) vapor. They are shifted along the y axis for clarity.



30 **Fig. S4** GIWAXS tube cut at the position of PCBM crystallites (q from 12 to 15.5 nm^{-1}). The black, red, green and blue line indicates the chlorobenzene, toluene, xylene and dichlorobenzene related sample, respectively. The curves are shifted along intensity axis for clarity.

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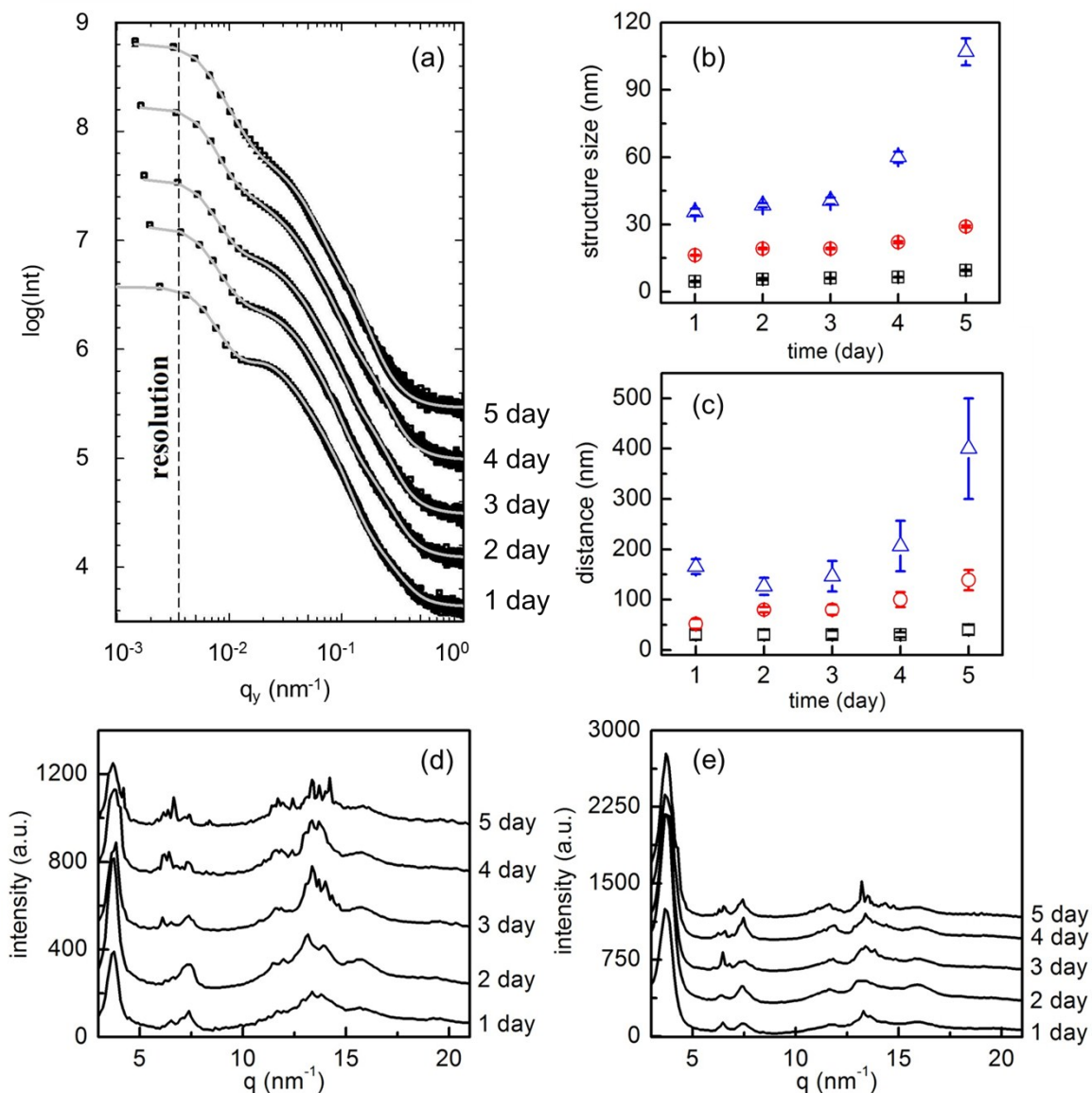


Fig. S5 P3HT:PCBM films aging in xylene vapor for 1, 2, 3, 4 and 5 days. (a) Horizontal line cuts of the 2D GISAXS data. (b) and (c) structure sizes and distances extracted from fits to the horizontal line cuts. (d) and (e) horizontal and vertical sector integrals of 2D GIWAXS data.

Notes S

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