

Supporting Information

Organic Photovoltaics Utilizing a Polymer Nanofiber/Fullerene Interdigitated Bilayer Prepared by Sequential Solution Deposition

Lin Xie¹, Ji Sang Lee², Yoonhee Jang¹, Hyungju Ahn³, Yun-Hi Kim^{2*}, Kyungkon Kim^{1*}

¹ Department of Chemistry and Nano Science, Ewha Womans University, Seoul 120-750, Korea

² Department of Chemistry and REGET, Gyeongsang National University, JinJu 660-701, Korea

³ Pohang Accelerator Laboratory, POSTECH, Pohang, 37673, Korea

Author information

Corresponding author

*E-mail: kimkk@ewha.ac.kr

Telephone number: +82-2-3277-3429

Polymer chain length can be estimated using known chemical bond lengths and the degree of polymerization which is ratio of M_n and M_w . The number and the weight average molecular weight of PONTBT was 16,200 and 27,200, respectively. The chemical structure of PONTBT is shown below:

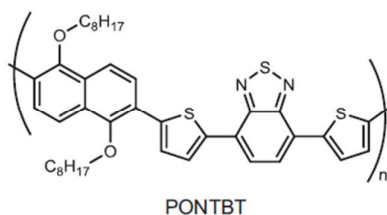


Figure S1. Chemical structure of PONTBT

Table S1. Bond distances and bond angles used for chain length estimation.

Bond	Bond length (pm)	Bond	Bond angle (°)
C-C	154	C-S-C	93
C-C (thiophene)	141	C=C-C	109
C-C (benzene)	140	C=C-S	114
C=C	134		
C-S (thiophene)	170		

Assuming conjugated backbone is fully stretched, the bond distances and bond angle used for calculation are summarized in Table S1. Based on the data in Table S1 following information were obtained:

$$\text{The length of repeating unit (L}_{\text{RU}}) = 2.8 \text{ \AA} \times 3 + 2.78 \text{ \AA} \times 2 + 1.54 \text{ \AA} \times 4 = 20.12 \text{ \AA}$$

$$\text{Mass of repeating unit (M}_{\text{RU}}) = 12.01 \times 40 + 1.008 \times 44 + 14.01 \times 2 + 32.07 \times 3 = 648.98 \text{ g/mol}$$

$$\text{Degree of polymerization (DP)} = M_n/M_{RU} = 16,200/648.98 = 24.962$$

$$\text{Length of polymer (L}_{\text{polymer}}\text{)} = \text{DP} \times 2.012 \text{ nm} = 50.22 \text{ nm}$$