Supporting Information for:

A New Strategy for Co-Assembling π-Conjugated Polymer/Cadmium Sulfide Hybrids into Efficient Charge-Transporting Nanochannel Array by Using All-Conjugated Diblock Copolymer Motif

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Materials.

All reagents and chemicals were purchased from Aldrich Chemical and carried out under purified nitrogen. Before use, ether and tetrahydrofuran (THF) were dried over sodium metal and freshly distilled. All other reagents and solvents were used as received.

Synthesis and Characterization of PPP-P3HT block copolymers.

First, 1,4-dibromo-2,5-dihexyloxybenzene and 2,5-dibromo-3-hexylthiophene monomers were synthesized by following previous reports.[1-4] Subsequently, 1,4-dibromo-2,5-dihexyloxybenzene was added into dried THF solvent (in flask A) and the solution was stirred under dry nitrogen. After a complete mixing, isopropylmagnesium chloride was added via syringe and the resulting mixture was refluxed at 70°C. After 2 hrs, the solution was cooled to room temperature, followed by adding [1,3-bis(diphenylphosphino)ethane]dichloronickel(II) ($Ni(dppe)Cl_2$) into the flask. Upon stirring for 2 hrs, a living PPP block was first obtained. Meanwhile, in an another flask (flask B), 2,5-dibromo-3-hexylthiophene monomers were mixed with THF, followed by a reaction with isopropylmagnesium chloride at 70°C for 2 hrs. Compounds in flask A and B were mixed together and stirred for another 2 hrs. Finally, the desired product was precipitated into methanol and washed by using Soxhlet apparatus with methanol and toluene solvents.

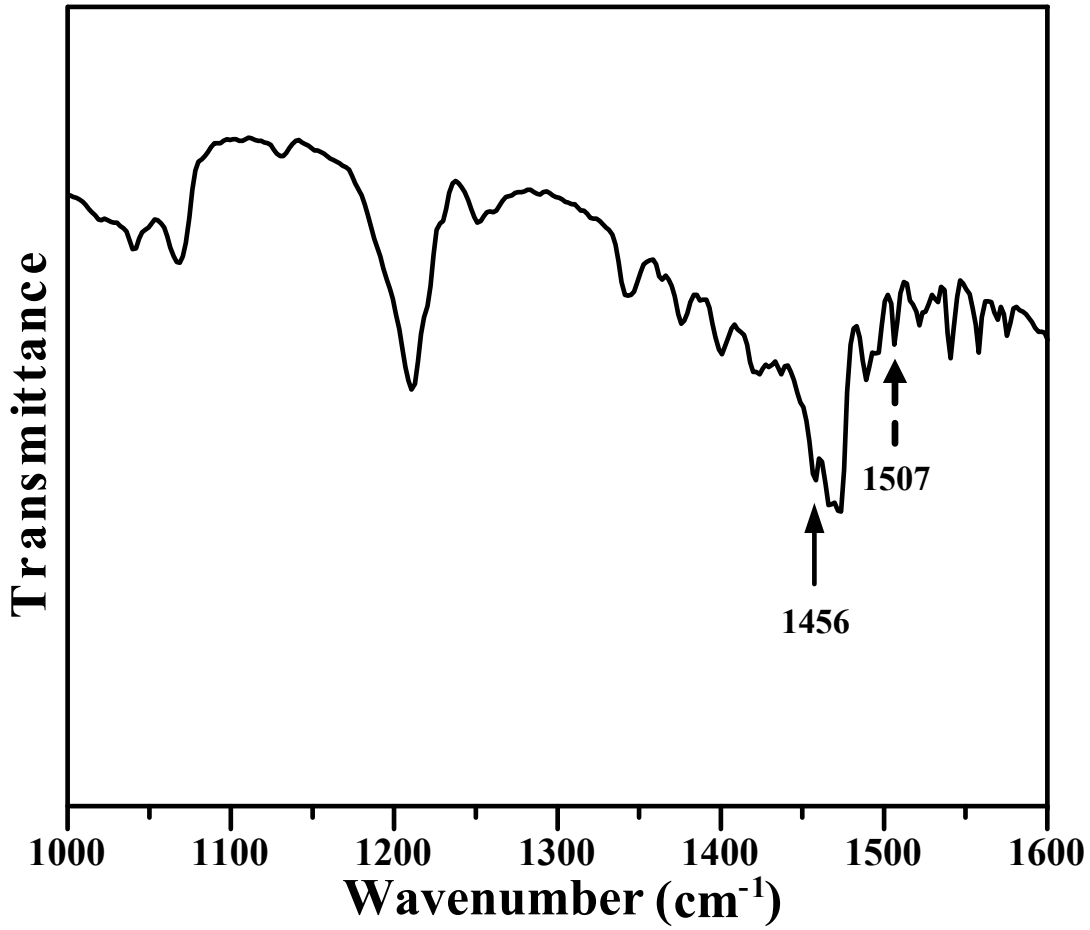

Figure S1. FTIR spectrum of pristine PPP homopolymer. The solid arrow indicates the signal of symmetric aromatic C=C stretching of PPP segments. The dashed arrow indicates the characteristic bands of PPP associated with the asymmetric aromatic C=C stretching.

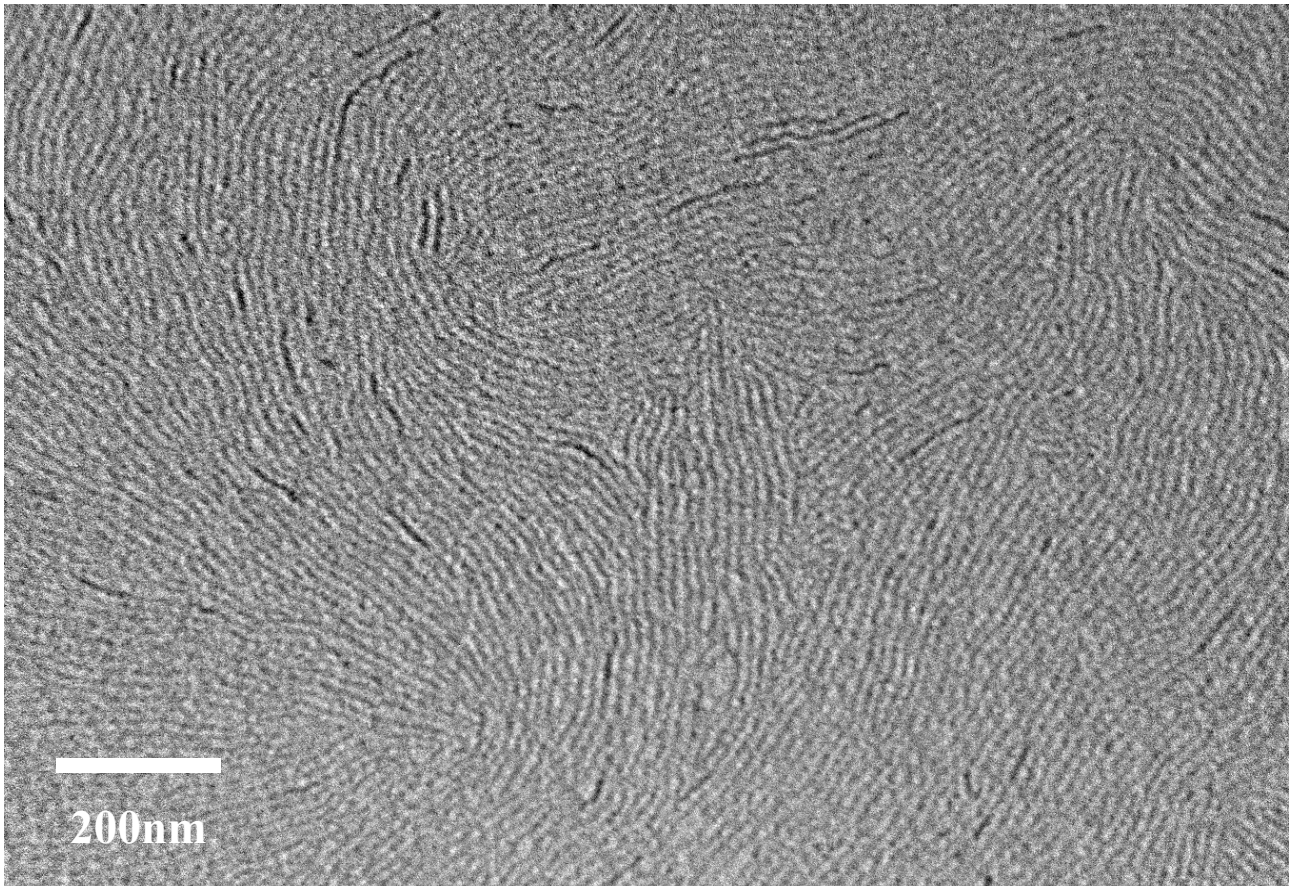

Figure S2. Low magnification TEM image of the PPP-P3HT/CdS-OH hybrid film with 3HT:CdS = 7:1.

References:

1. R. Miyakoshi, K. Shimono, A. Yokoyama and T. Yokozawa, *J. Am. Chem. Soc.*, 2006, **128**, 16012-16013.
2. R. Miyakoshi, A. Yokoyama and T. Yokozawa, *Chem. Lett.*, 2008, **37**, 1022-1023.
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