Electronic Supplementary Information

Hybrid Conjugated Polymer/Magnetic Nanoparticle Composite Nanofibers through Cooperative Non-Covalent Interactions

Lingyao Meng, Brad W. Watson II, and Yang Qin*

Department of Chemistry & Chemical Biology, University of New Mexico, MSC03 2060, 1 UNM, Albuquerque, New Mexico, 87131, United States

* Corresponding Author; E-mail: yangqin@unm.edu

Figure S1. UV-vis absorption spectra of nanofiber solutions of (A) P3HT, (B) BCP1, and (C) BCP2.
Figure S2. Selected area electron diffraction (SAED) pattern (A) and powder X-ray diffraction spectrum (B) of IONP-OA.

Figure S3. Infrared (IR) spectra on powders of IONP-OA (black), BCP1 (Blue), and precipitate of BCP1/IONP-OA mixture (red). OA: oleylamine; Py: pyridine.
Figure S4. Photographs of well-dissolved solutions of P3HT (left), BCP1 (middle), and BCP2 (right) mixed with IONP-OA in chlorobenzene (2/1 wt./wt., 10 mg/mL polymer concentration) placed next to a permanent magnet cube. In each photo, the mixture solutions sit on the left and on the right are the pure IONP-OA solutions in chlorobenzene at identical concentrations.

Figure S5. X-ray diffraction (XRD) profiles of thin films (100 nm in thickness, thermal annealed at 150 °C for 10 min) of BCP2 NF (black), BCP2 NF/PCBM (red), BCP2 NF/IONP (blue) and BCP2 NF/IONP/PCBM (green).
Table S1. Average numbers ($N_{avg}$) and maximum numbers ($N_{max}$) of IONPs closely associated with one polymer NF, from sampling ca. 50 individual NFs in TEM images.

| Polymer NF / IONP Type | $N_{avg}$ of IONP per NF | $N_{max}$ of IONP per NF |
|------------------------|--------------------------|--------------------------|
| P3HT NF / IONP-OA     | 1.1±1.1                  | 4                        |
| P3HT NF / IONP-L-OA   | 0.3±0.5                  | 3                        |
| P3HT NF / IONP-CA     | N/A                      | N/A                      |
| BCP1 NF / IONP-OA     | 4.9±2.6                  | 17                       |
| BCP1 NF / IONP-L-OA   | 3.6±1.3                  | 10                       |
| BCP1 NF / IONP-CA     | 3.9±3.3                  | 15                       |
| BCP2 NF / IONP-OA     | Unable to count          | 34                       |
| BCP2 NF / IONP-L-OA   | 4.7±1.9                  | 14                       |
| BCP2 NF / IONP-CA     | 9.6±8.0                  | 48                       |