Electronic Supplementary Material (ESI) for Nanoscale

Electronic Supplementary Information

Assembly and Organization of Poly(3-hexylthiophene) Brushes and Their Potential Use as Novel Anode Buffer Layers for Organic Photovoltaics

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Thermal Characterizations. The temperature range used for studies of P3HT brush formation was identified through standard thermal gravimetric analysis performed using a TA Instruments Q5000IR TGA and a protocol in which the samples were heated from ambient temperature to 500.0 °C at 10.0 °C/min. Both P3HT-3K and P3HT-4K show an onset of degradation around 450 °C, as seen in **Figure S1**.

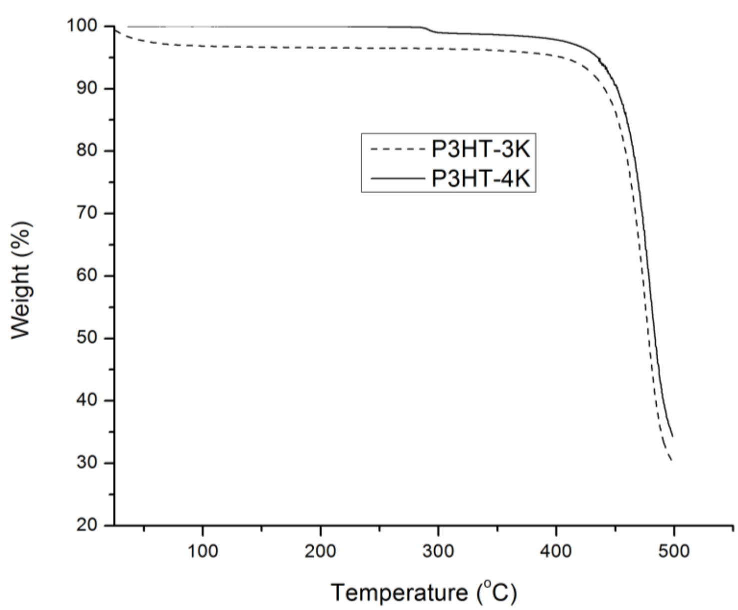

Figure S1. TGA thermograms of P3HTs used in this study.

A TA Instruments Q1000 differential scanning calorimeter (DSC) was used to evaluate thermal transitions of the P3HTs from the second heating ramp of a heat/cool/heat protocol. The DSC was baseline calibrated using sapphire standards (TA Instruments) and the temperature calibration was performed with an indium standard (melting point of 156.6 °C, provided by TA Instruments). Samples were first equilibrated at -50.0 °C, then heated to 250.0 °C using a ramp rate of 5.0 °C/min, cooled to -50.0 °C at 5.0 °C/min, and finally heated to 250.0 °C at the same ramp rate. Melting temperatures of 216 °C and 208 °C for P3HT-3K and P3HT-4K, respectively, are assigned from the peak in the heat flow curve acquired during a second heating cycle (identified by red crosses). **Figure S2** shows those DSC heat flow curves along with an inset plot showing the derivative of heat flow as a function of temperature. This representation of the data also indicates that melting temperatures are ~210 °C for these low molecular weight P3HTs. These melting temperatures are in good agreement with values reported by Zhao et al.[S1]

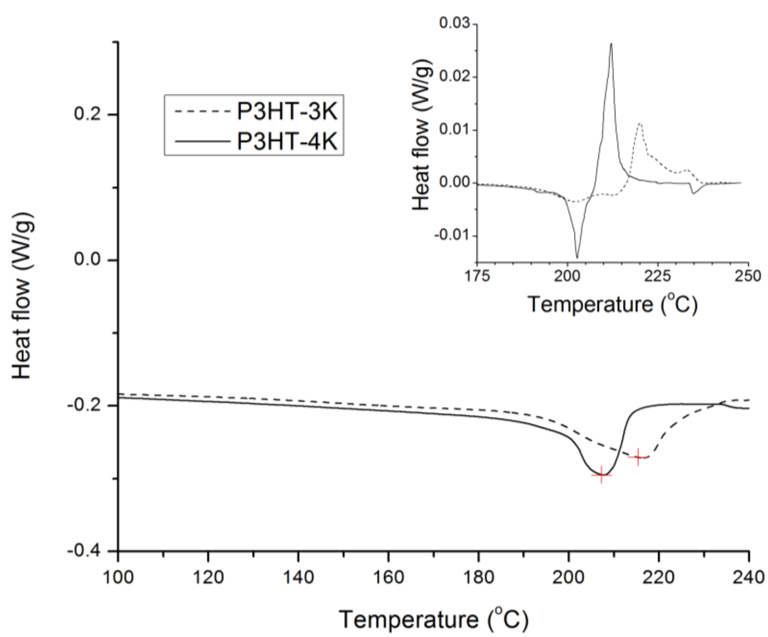

Figure S2. DSC heat flow traces of the second heating cycle and (inset) the derivative of heat flow.

Reference

[S1] Zhao, J.; Swinnen, A.; Van Assche, G.; Manca, J.; Vanderzande, D.; Van Mele, B. J. Phys. Chem. B 2009, 113, 1587-1591.