Supporting Information

for

Self-assembly of core-shell magnetic bottlebrush poly(ionic liquids): morphologies vs magnetic property

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1. Experimental sections

Instrumentation. ^{1}H NMR spectra were recorded on Bruker AVANCE III 400 MHz spectrometer at 298 K with $CDCl_3$ or DMF-d_7 as solvent. Chemical shifts were reported in ppm on the δ scale with tetramethylsilane as interior standard. The gel permeation chromatography (GPC) measurements of the samples were performed on Waters GPC equipped with 1515 HPLC pump, 2414 RI detector and three Agilent mixed columns (Agilent, PL gel 10 μm, MIXED-B; Agilent, PL gel 5 μm, MIXED-C). The eluent was DMF with 0.01 M LiBr and the flow rate is 1.0 mL/min. Polystyrene standards were used for calibration. The differential scanning calorimetry (DSC) test is performed on Q2000 Differential Scanning Calorimeter, the sample is weighed and placed in a crucible. The testing is carried out under a nitrogen atmosphere, with a heating rate of 10 °C/min, within the temperature range of -20 to 120 °C. The second heating curve was used for analyses. The thermogravimetric analysis (TGA) test was performed on the TAQ50 instrument with a heating rate of 10 °C/min and a test temperature range of 100-900 °C. Raman spectra were tested at a Horiba-LabRAM HR Evolution using 785 nm excitation wavelength.

2. Supporting Figures

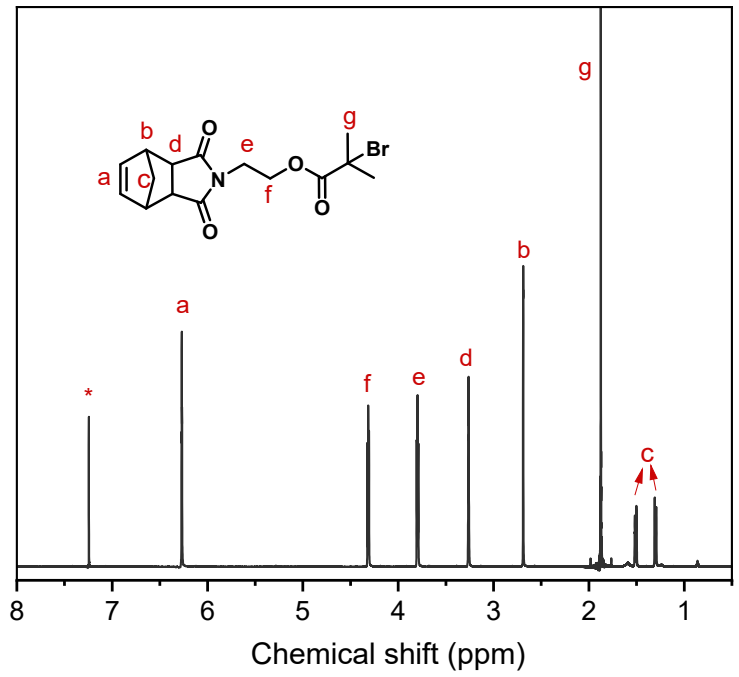

Figure S1. ^{1}H NMR spectrum of BrNDC in $CDCl_3$.

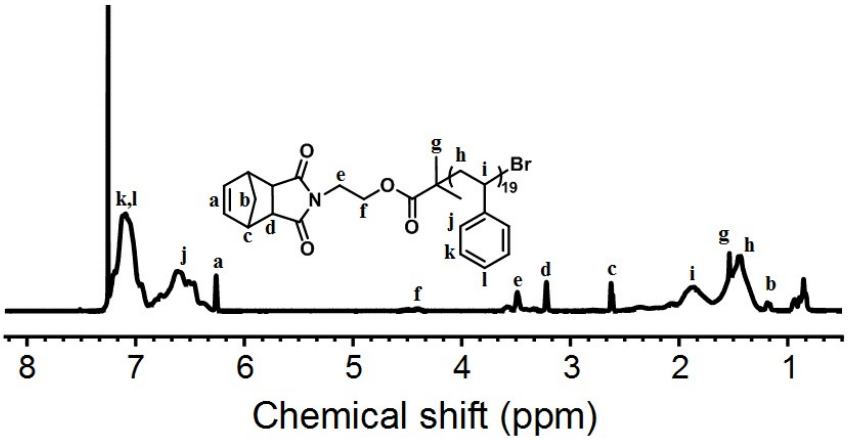

Figure S2. ^{1}H NMR spectrum of NB-PS in $CDCl_3$.

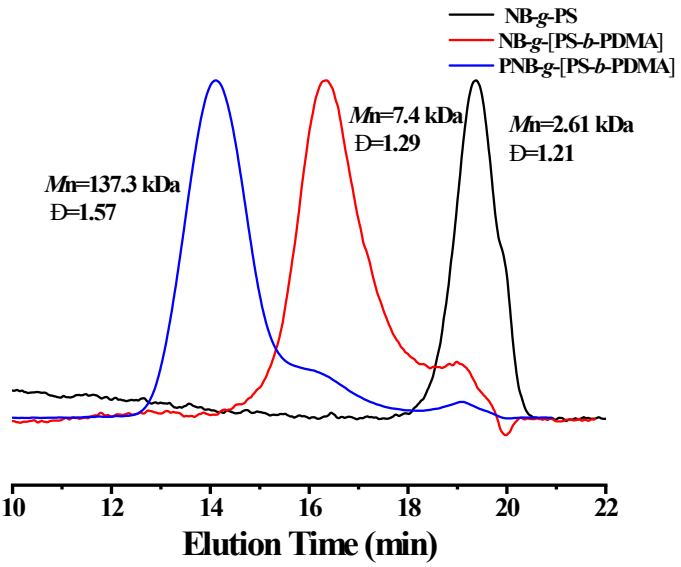

Figure S3. GPC traces of NB-PS-*b*-PDMA and P(NB-PS-*b*-PDMA) with THF as eluent.

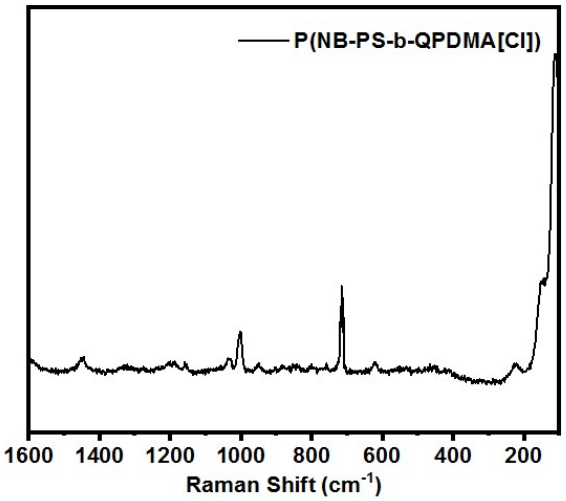

Figure S4. Raman spectrum of P(NB-PS-*b*-QPDMA[Cl]).

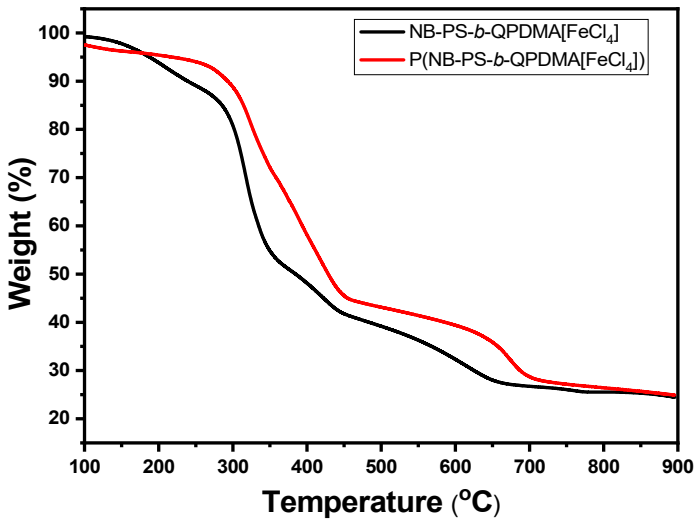

Figure S5. TGA patterns of NB-PS-*b*-QPDMA[$FeCl_4$] and P(NB-PS-*b*-QPDMA[$FeCl_4$]).

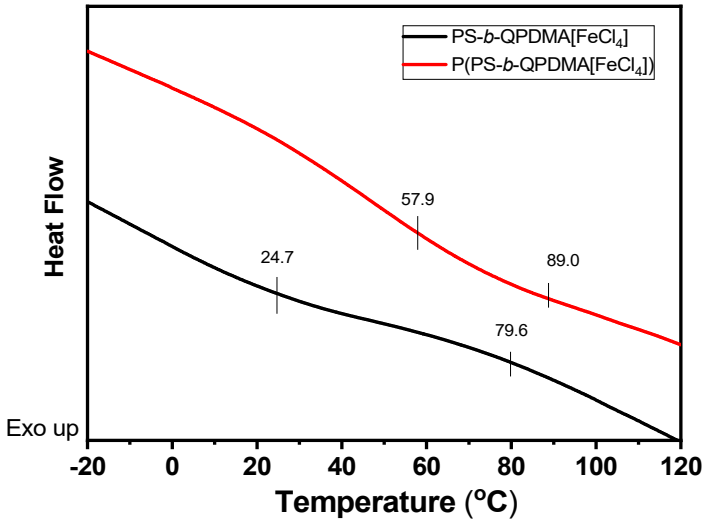

Figure S6. DSC patterns of NB-PS-*b*-QPDMA[$FeCl_4$] and P(NB-PS-*b*-QPDMA[$FeCl_4$]).

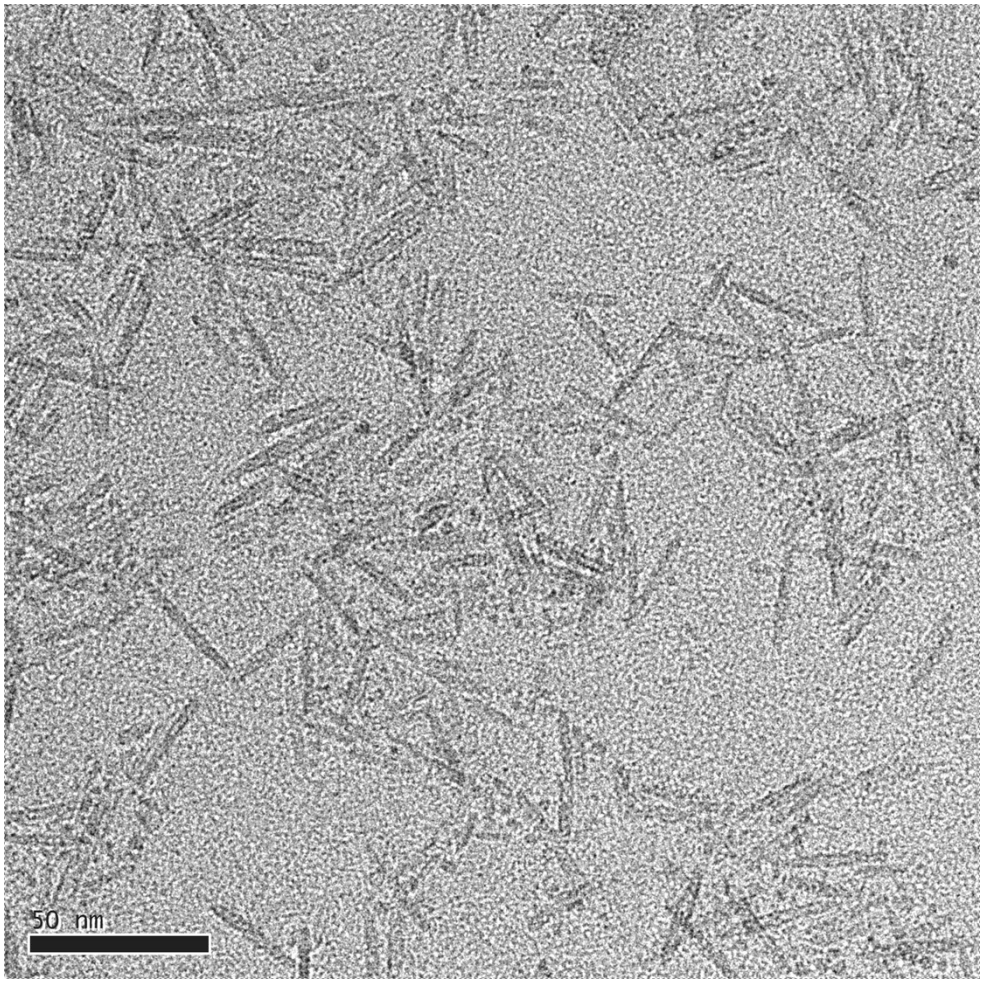

Figure S7. SEM image of P(NB-PS-*b*-QPDMA[$FeCl_4$]) after bulk self-assembly.