Supporting Information

Formation of Nanostructured Materials Using Inexpensive Hollow Particles of Amphiphilic Graft Copolymers as Building Blocks:

1. Insight into the Mechanism of Nanotube Formation

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Composition of PMMA/PEI Core–Shell Particles

After purifying the PMMA/PEI particles by repeated centrifugation and decantation cycles, the particles were freeze-dried to yield white powders. The PMMA homopolymer in the core and PEI-*g*-PMMA copolymer were isolated with chloroform using a Soxhlet extractor for 48 h. The isolated graft copolymers and PMMA homopolymers were characterized with FTIR spectroscopy (Figure S1). The FTIR spectrum of the copolymers showed strong absorption peaks at 1730 cm^{-1} (stretching vibrations of C=O) and 3400 cm^{-1} (stretching vibrations of N–H), corresponding to carbonyl groups of PMMA and amino groups of PEI,

respectively. Composition of the particles was determined gravimetrically. Grafting efficiency of the particles, which is defined as the weight of grafted PMMA divided by the total weight of MMA polymerized, was 62%. In other words, the PMMA cores contained 62% w/w grafted PMMA and 38% w/w PMMA homopolymer. Thus, the weight ratio of the grafted PMMA to the PEI backbone of the graft copolymer was about 2.1 : 1.

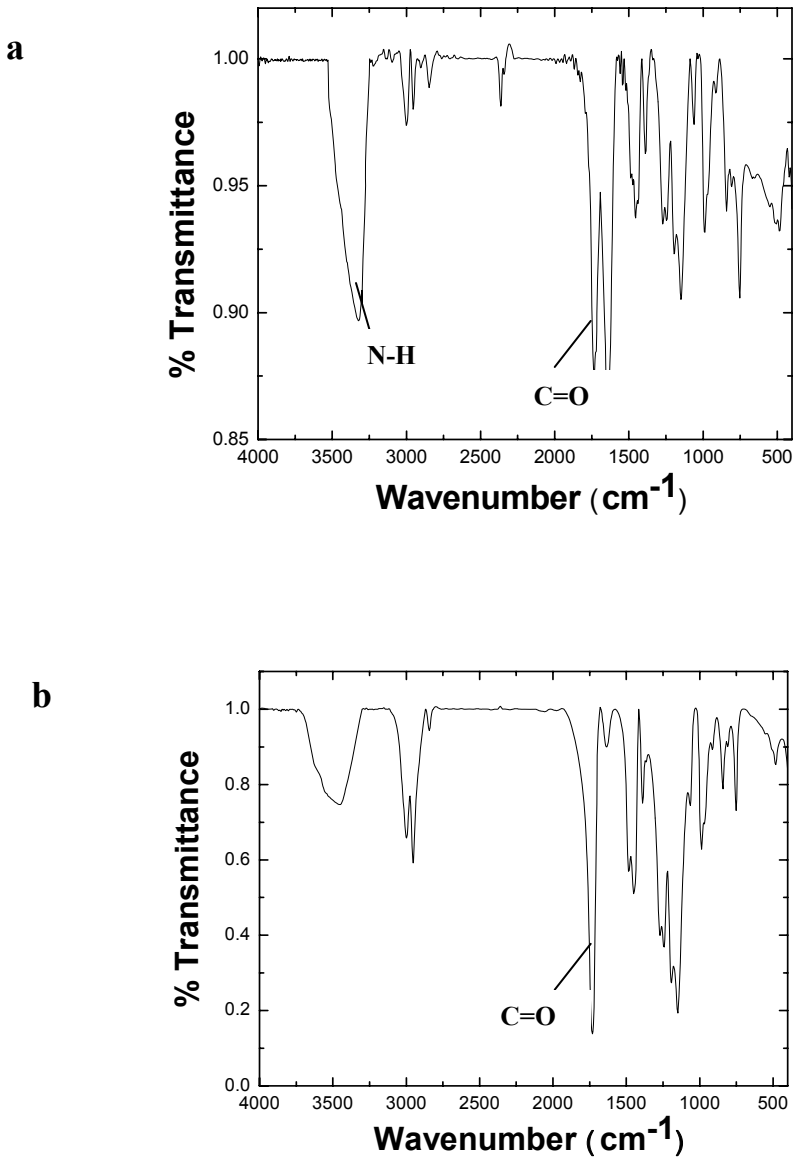

Figure S1. FTIR spectrum of (a) PEI-*g*-PMMA copolymer and (b) PMMA homopolymer.

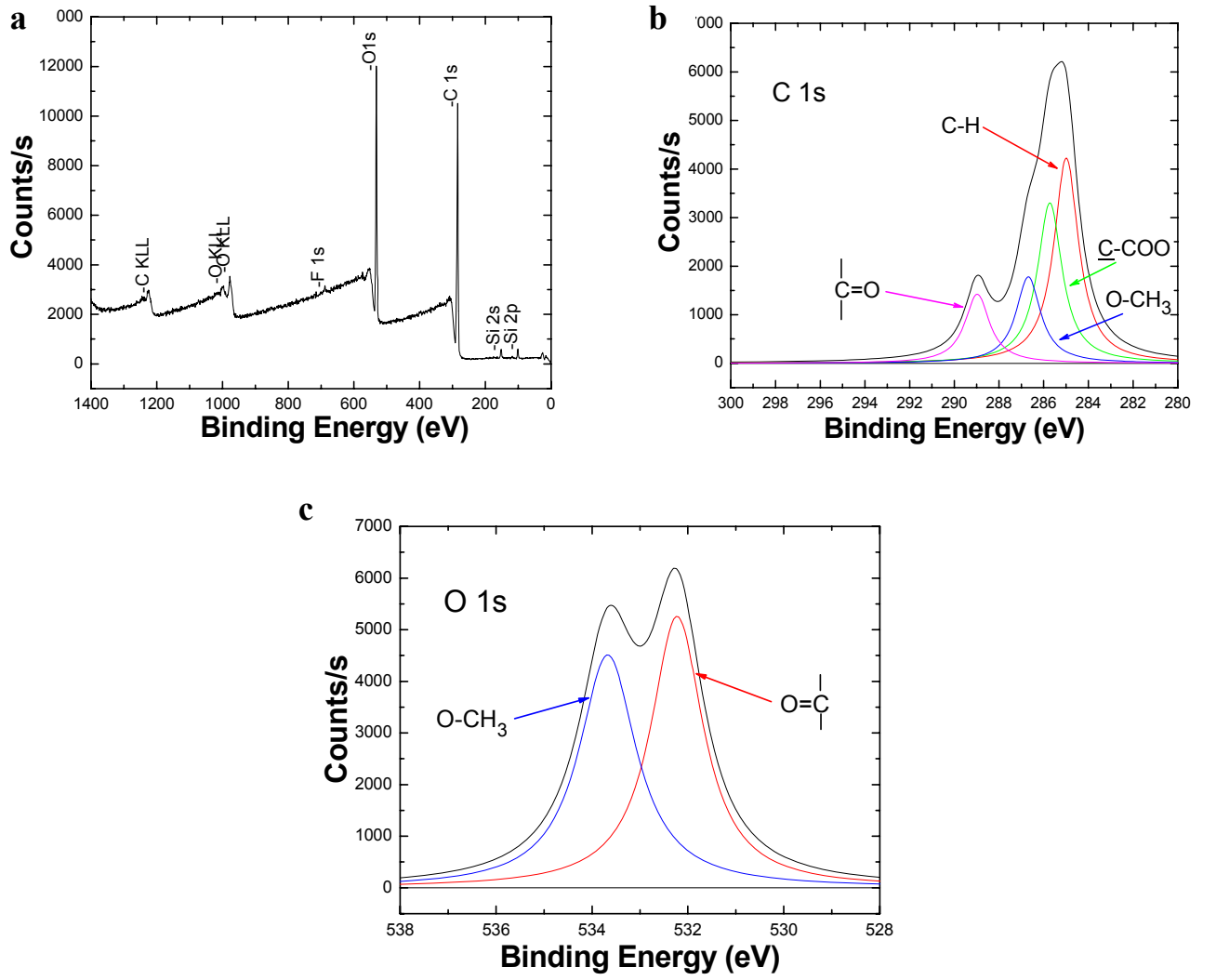

Figure S2. XPS spectra of hollow particles in DCM. (a) Survey spectrum. (b) Deconvolution profiles of C1s. (c) Deconvolution profiles of O1s.

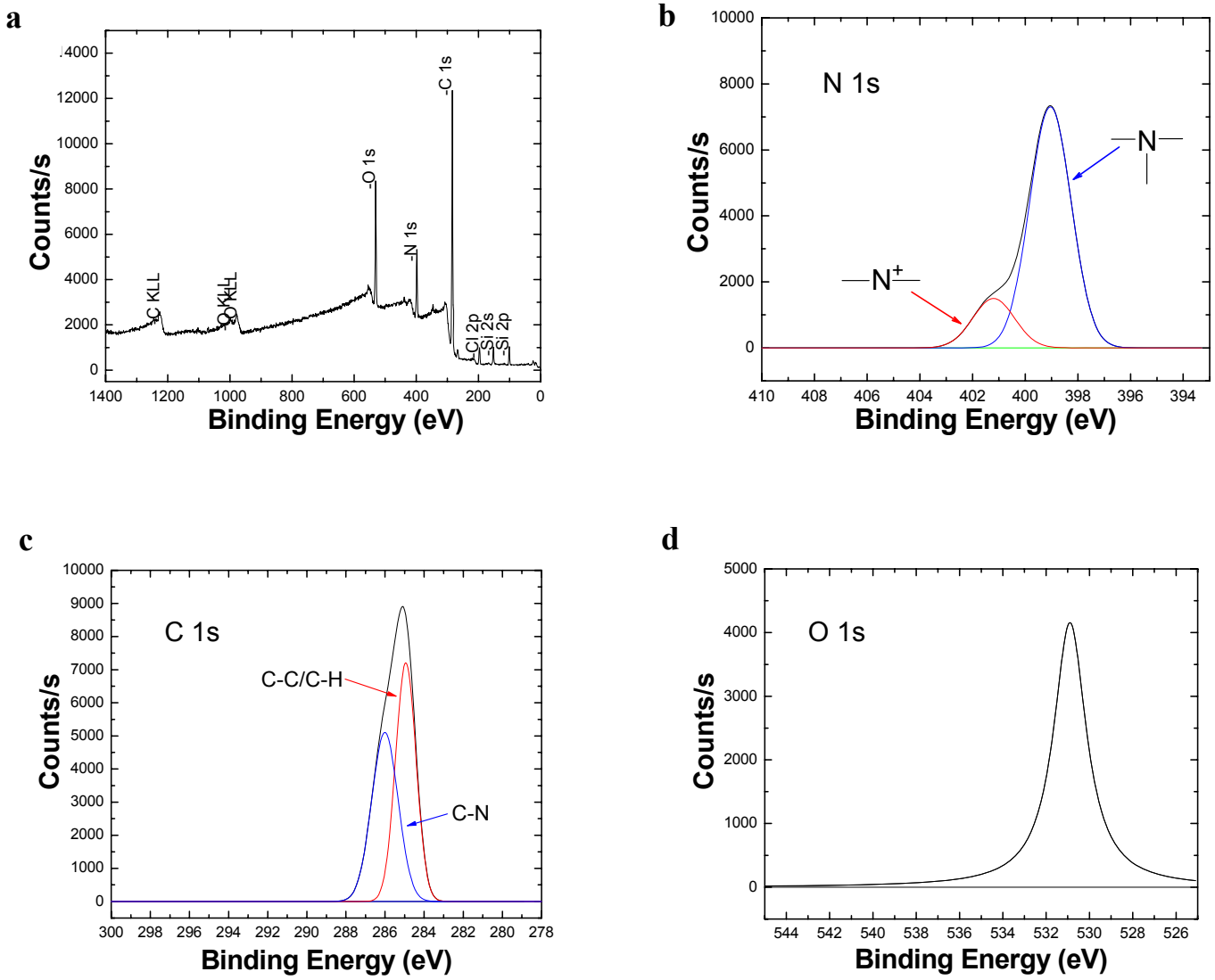

Figure S3. XPS spectra of hollow particles obtained from aqueous solution. (a) Survey spectrum; (b) Deconvolution profiles of N1s; (c) Deconvolution profiles of C1s; (d) Deconvolution profiles of O1s.

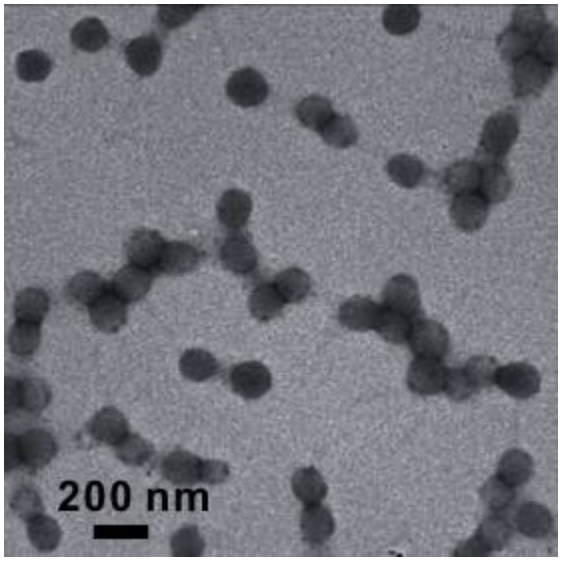

Figure S4. Bright-field TEM image of the hollow particles without stirring for 5 days at 17 °C. The hollow particle sample was obtained from a water layer of a DCM/water mixture (3/7 v/v).