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Supporting Information

Nanoparticle-supported polymer brushes for temperature-regulated glycoprotein separation: investigation of structure-function relationship

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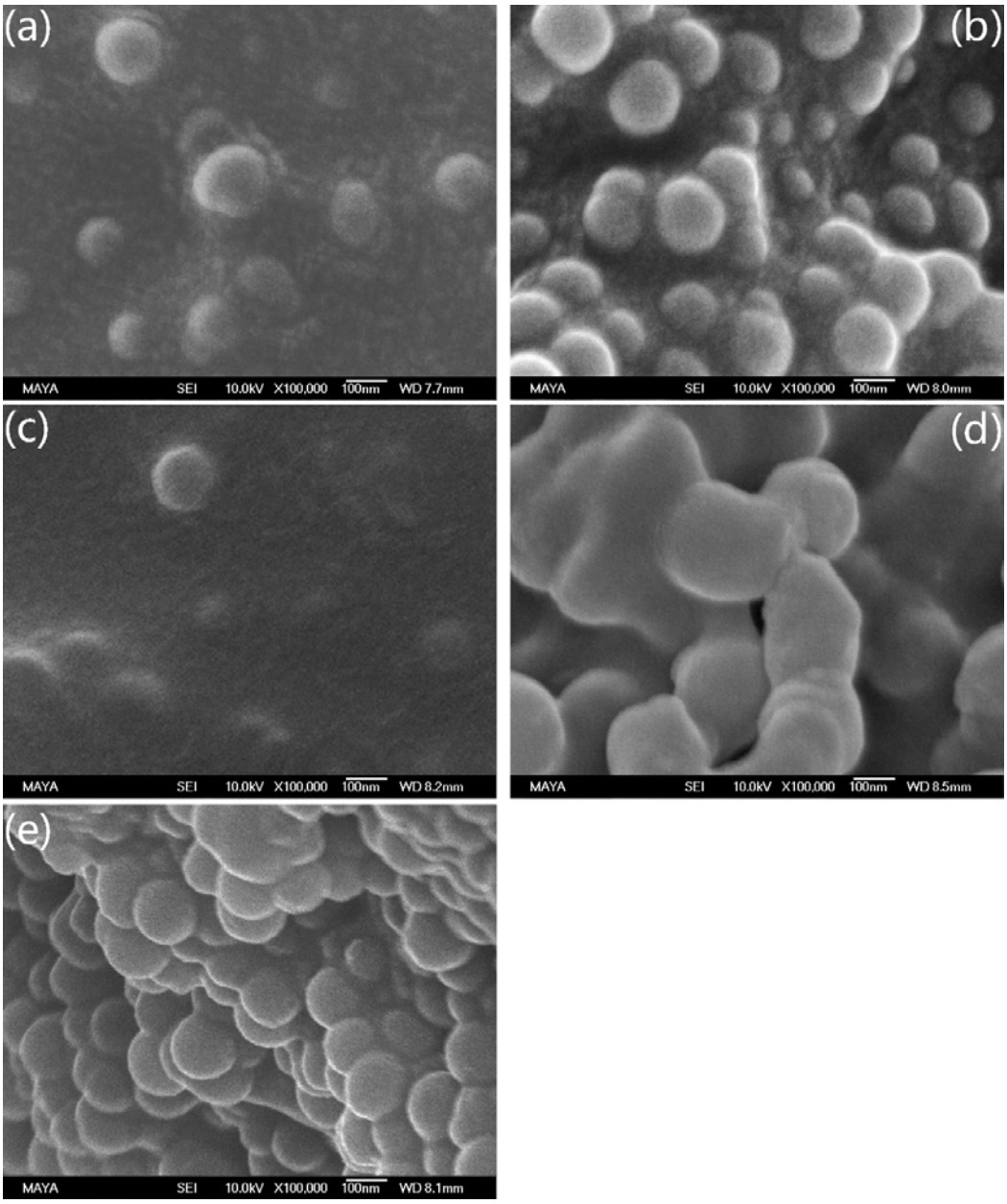

Figure S1. SEM images of (a) Si@NH_2, (b) Si@initiator, (c) Si@pGMA, (d) Si@pco and (e) Si@pNIPAm.

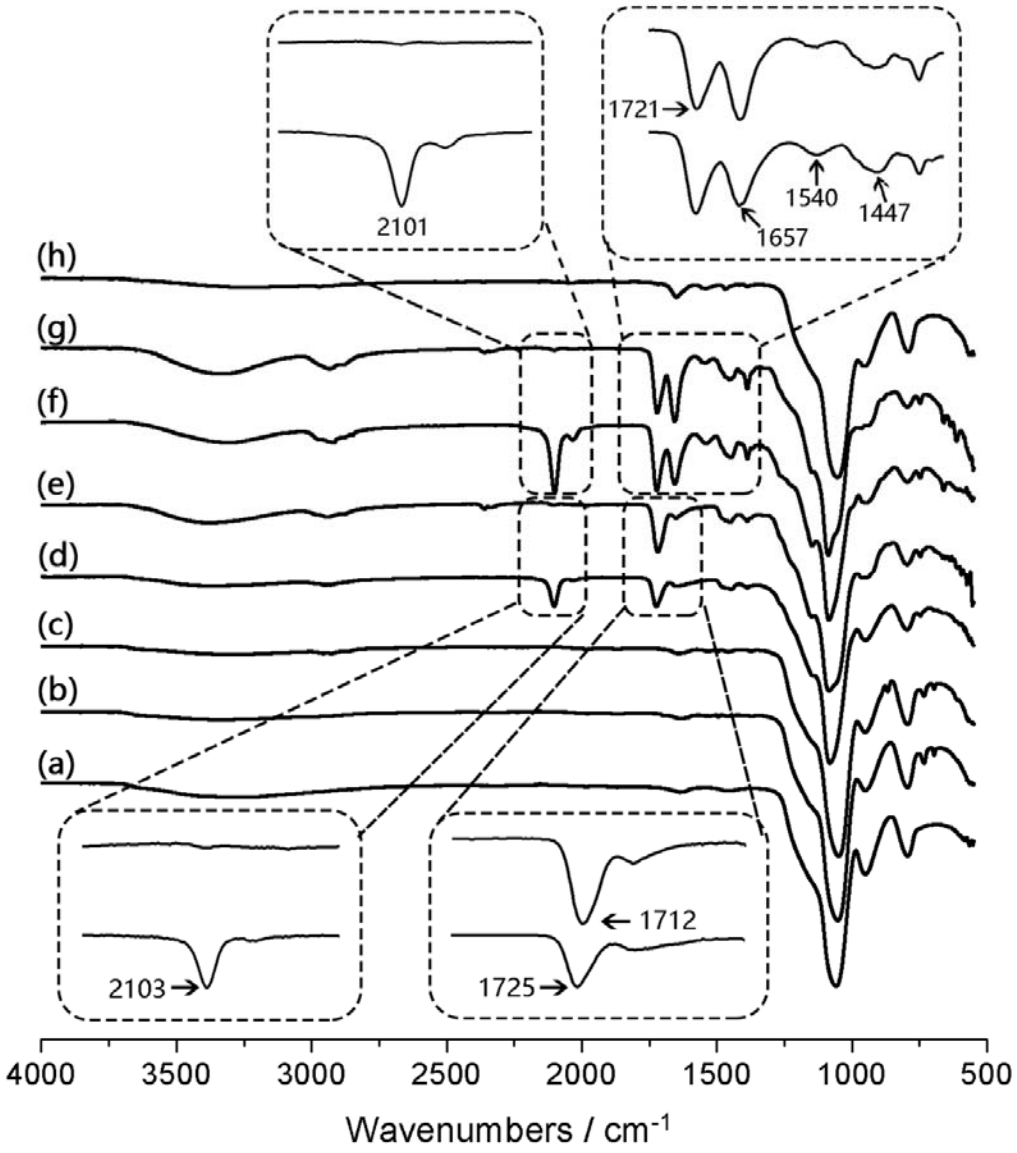

Figure S2. FT-IR spectra of (a) Si, (b) Si@NH_2, (c) Si@initiator, (d) Si@pGMA-N_3@N_3, (e) Si@pGMA-OH@N_3, (f) Si@pco-N_3@N_3, (g) Si@pco-OH@N_3, (h) Si@pNIPAm@N_3.

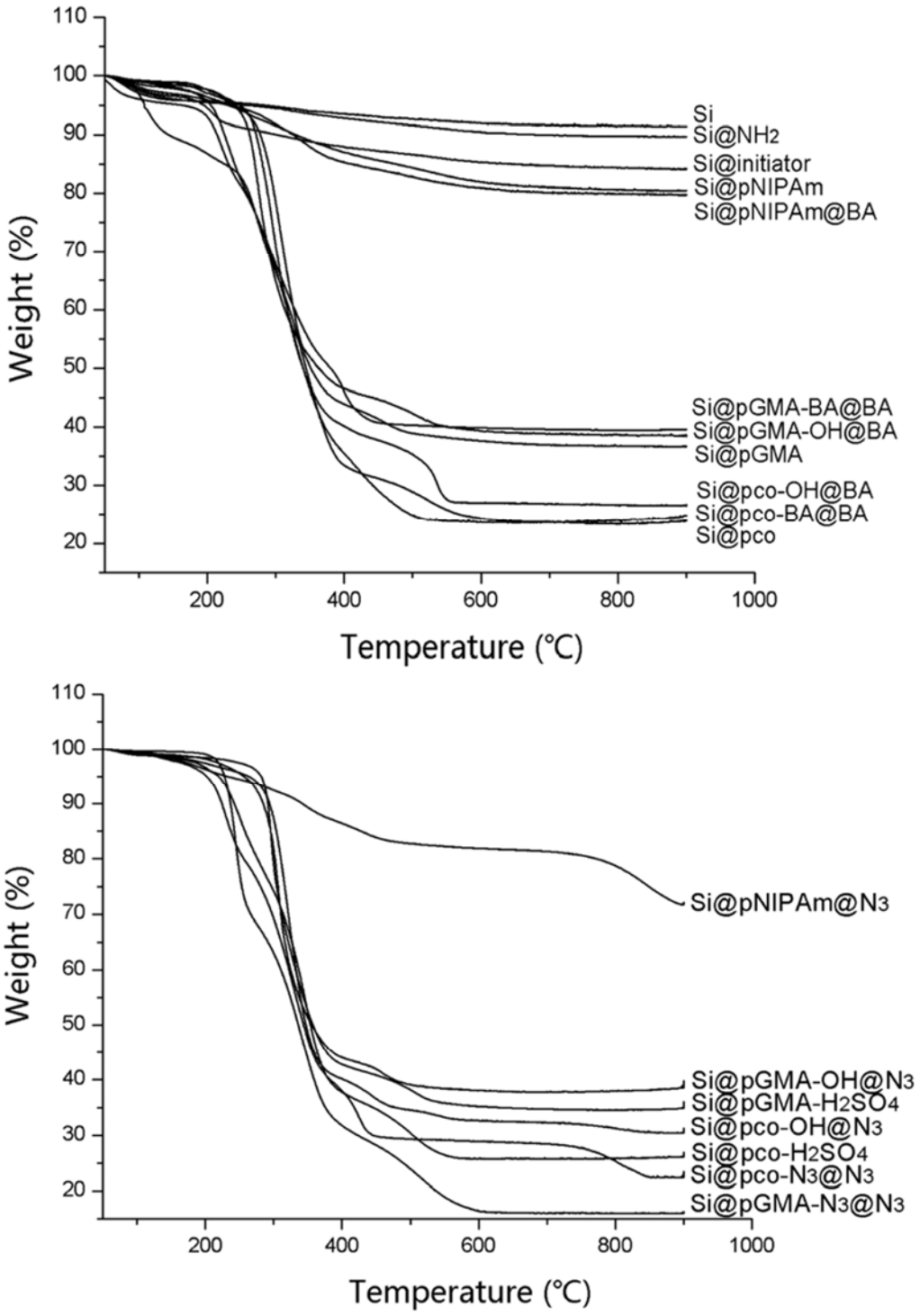

Figure S3. TGA analysis results of the nanoparticles and nanoparticle-supported polymer brushes.

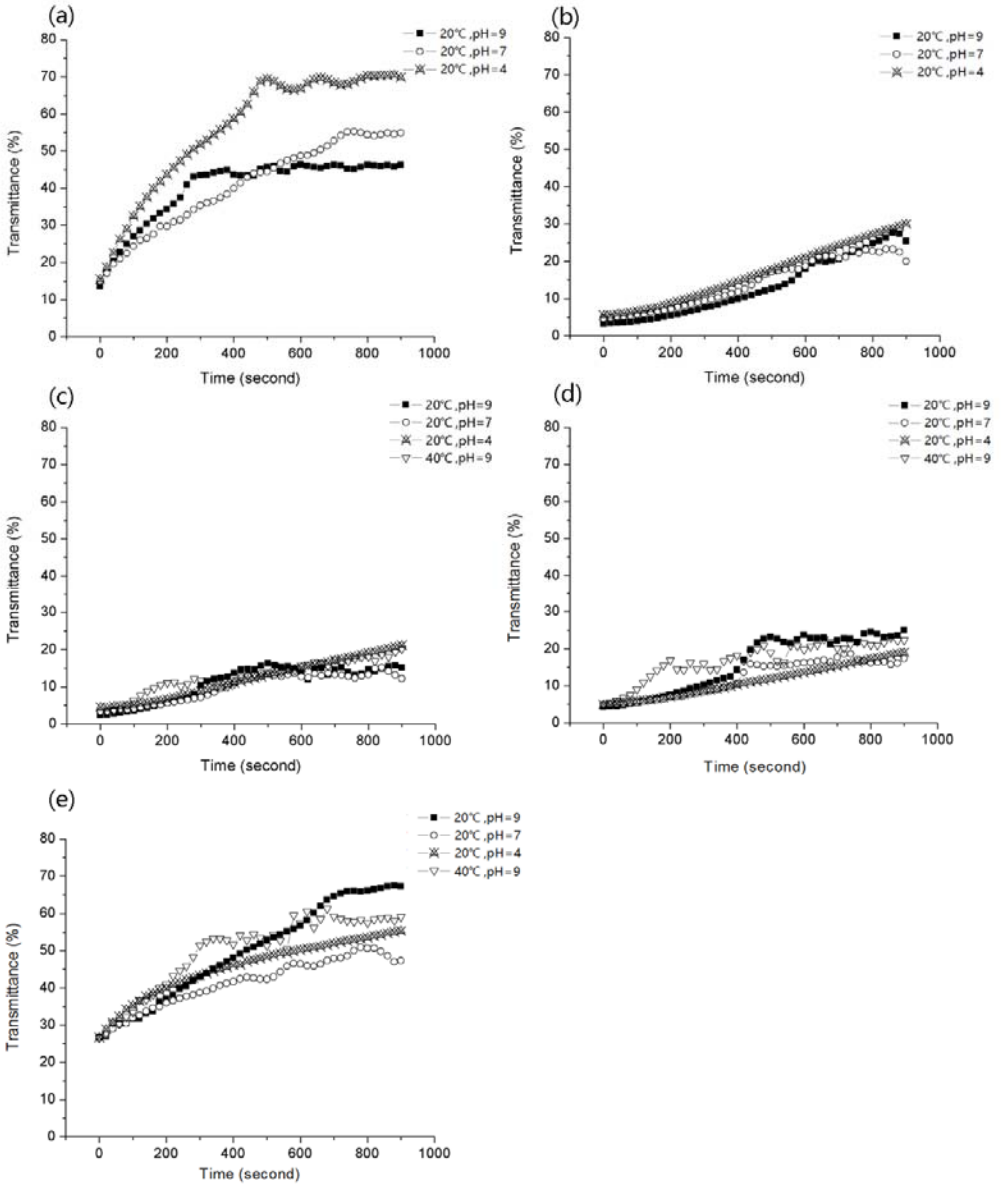

Figure S4. Measurement of the rate of sedimentation of composite particles (a) Si@pGMA-BA@BA, (b) Si@pGMA-OH@BA, (c) Si@pco-BA@BA, (d) Si@pco-OH@BA and (e) Si@pNIPAm@BA in buffer adjusted to different pH values and at different temperatures. The composite particles (3 mg) were dispersed in 2 mL of 20 mM phosphate buffer (pH adjusted to 9.0 and 7.4) or 20 mM acetate buffer (pH 4.0), both containing 0.5 M NaCl. The particle suspension was sonicated for 5 min and immediately transferred into a UV-Vis spectrophotometer. The transmittance of the particle suspension at 800 nm was measured continuously for 15 min. The temperature of the particle suspension was maintained at 20 °C or 40 °C during the measurement.

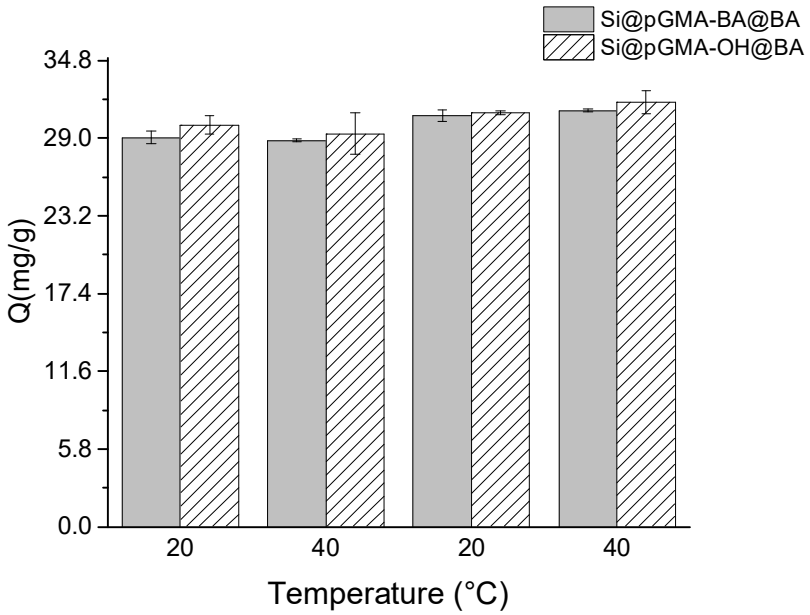

Figure S5. HRP binding to Si@pGMA-BA@BA and Si@pGMGA-OH@BA particles measured at 20 °C and 40 °C. The particles were mixed with a protein solution containing 0.1 mg/mL HRP and 1 mg/mL BSA in pH 9 buffer. The samples were kept at 20 °C and 40 °C for 2 h before the free HRP was measured.