

Fig. S1 DLS spectrum of prepared PS microspheres.

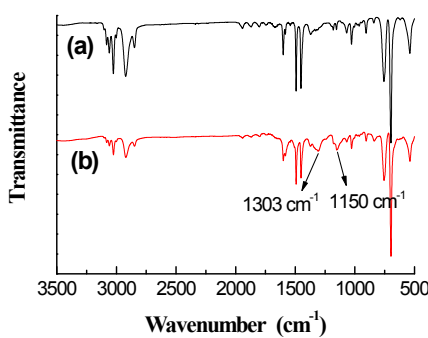


Fig. S2 FTIR spectra of PS microspheres (a) and PS/PANi composite particles (b).

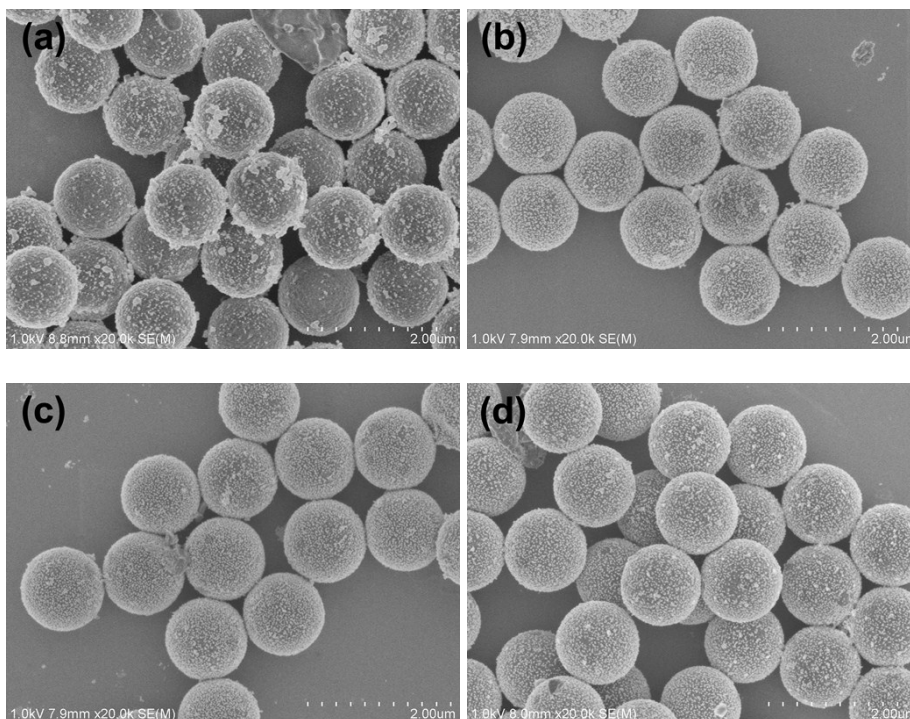


Fig. S3 SEM images of PS/PANi-Au composite particles prepared by mixing the PS/PANi composite particles and Au NPs in water at different pH, (a) 2; (b) 3; (c) 4; (d) 5.

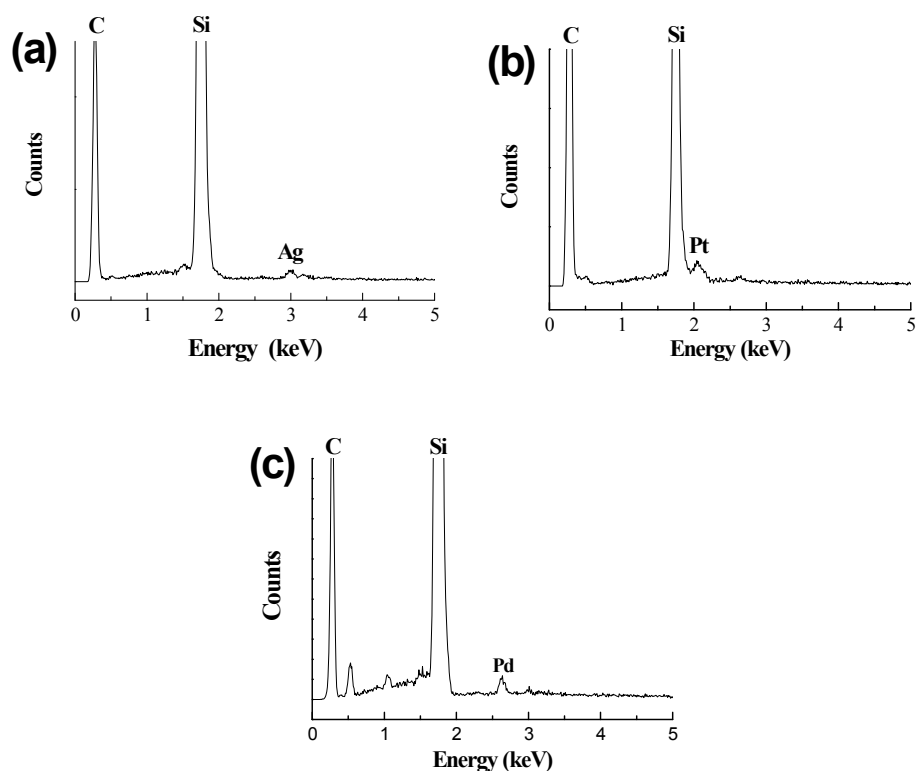


Fig. S4 EDX spectra of PS/PANi-Ag (a), PS/PANi-Pt (b), and PS/PANi-Pd (c) composite particles.

Calculation of the content of Au NPs according to the results of TGA performed in N₂

Based on the TGA curve of PS/PANi composite particles, we can obtain the weight ratio ($w = m_1/m_2$) of the residual carbon-rich materials (m_1) derived from PANi and the decomposed component (m_2) consisting of PS microspheres and partial PANi. As for the PS/PANi-Au composite particles, the residual weight was composed of corresponding carbon-rich materials and Au NPs, and the decomposed part was identical to the case of PS/PANi composite particles. Thus, on the basis of the value

of w , the weight percentage of carbon-rich materials in the residue owing to the decomposition of PS/PANi-Au composite particles can be determined. Afterward, the content of Au NPs in the three-component composite particles can be obtained by subtracting the weight percentage of carbon-rich materials from the weight percentage of carbon-rich materials and Au NPs.