Supporting Information

Figure S1. The digital camera images of PNIPAAm film (a), PNIPAAm / AgNPs composite film under 25 °C (b) and PNIPAAm / AgNPs composite film under 40 °C (c).

Figure S2. (A) SERS spectra of $1 \times 10^{-4}$ M 4-Mpy using PNIPAAm / AgNPs composite film as SERS substrate with different deposition time and (B) the corresponding deposition time-dependent SERS intensity at 1097 cm$^{-1}$.

Figure S3. Schematic illustration of the pattern of AgNPs on PNIPAAm film.
Figure S4. (A) SERS spectra of $1 \times 10^{-9}$ M CV using PNIPAAm / AgNPs composite film as SERS substrate with increasing temperatures and (B) the corresponding temperature-dependent SERS intensity at 971 cm$^{-1}$.

Figure S5. (A) SERS spectra of $1 \times 10^{-4}$ M anthracene using PNIPAAm / AgNPs composite film as SERS substrate with increasing temperatures and (B) the corresponding temperature-dependent SERS intensity at 1090 cm$^{-1}$. 
Figure S6. SERS spectra of $1 \times 10^{-4}$ M 4-mercaptopyridine adsorbed on the PNIPAAm / AgNPs composite film recorded at pH=7 (a), pH=4 (b) and pH=10 (c).

Figure S7. SERS spectra of $1 \times 10^{-4}$ M 4-mercaptopyridine adsorbed on the PNIPAAm / AgNPs composite film recorded in water (a), 3.5 % NaCl (b) and 15 % NaCl (c).

Figure S8. The SERS spectra of 4-Mpy ($1 \times 10^{-4}$ M) using PNIPAAm / AgNPs composite film as SERS substrate with different storage time.