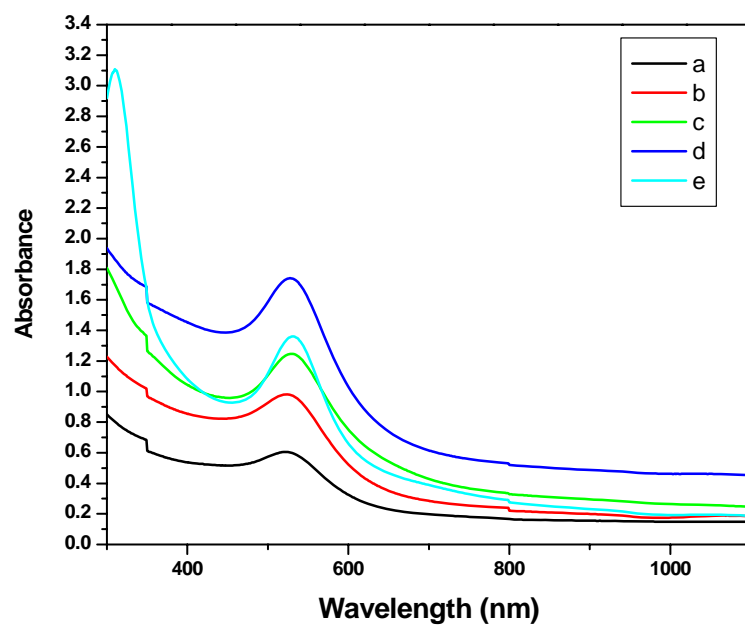
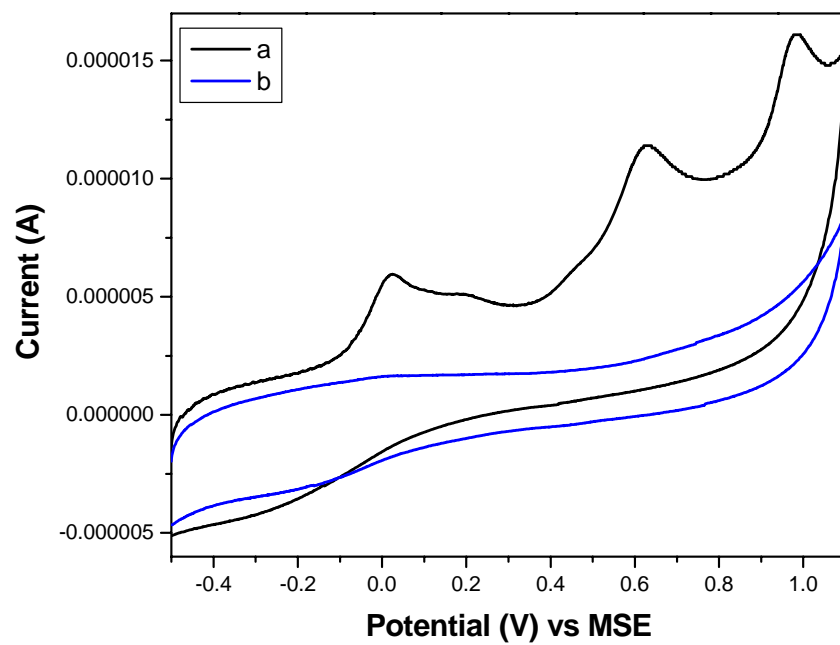


S1.-3 UV-vis spectra obtained during the formation of AuNPs at different time intervals after addition of H<sub>2</sub>AuCl<sub>4</sub> to the solution containing TPB (both concentrations is  $1.00 \times 10^{-3}$  M)



S-2. UV-vis spectra of PVP stabilized AuNPs of various concentration (a)  $0.25 \times 10^{-3}$ , (b)  $0.50 \times 10^{-3}$ , (c)  $0.75 \times 10^{-3}$ , (d)  $1.00 \times 10^{-3}$ , and (e)  $2.00 \times 10^{-3}$  M of  $\text{HAuCl}_4$  solution using  $1 \times 10^{-3}$  M TPB as reductant.



S-3 Cyclic voltammetry of TPB ( $1.00 \times 10^{-3}$ ), PVP (0.01g) dissolved in 0.5M  $\text{H}_2\text{SO}_4$  solution containing with (blue color line) and without (black color line)  $\text{HAuCl}_4$