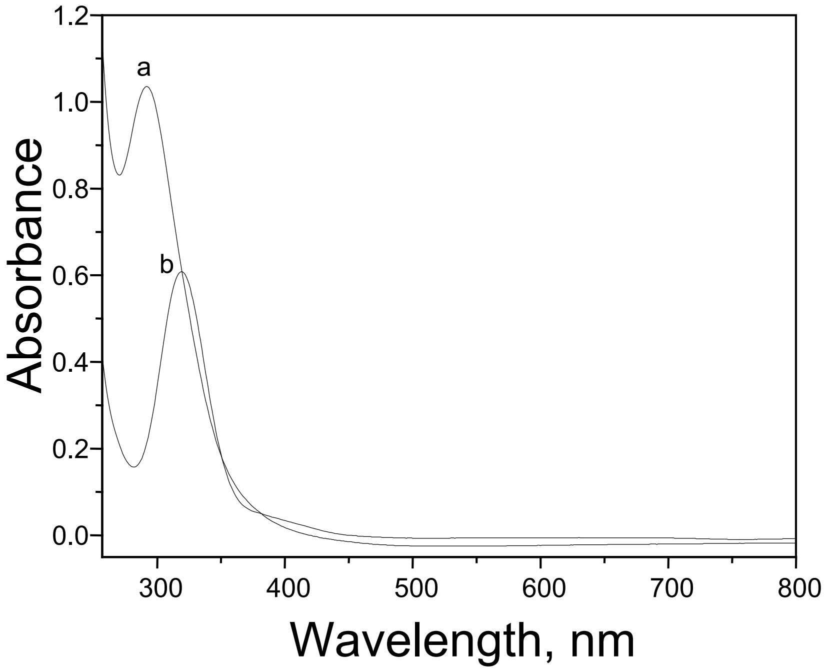
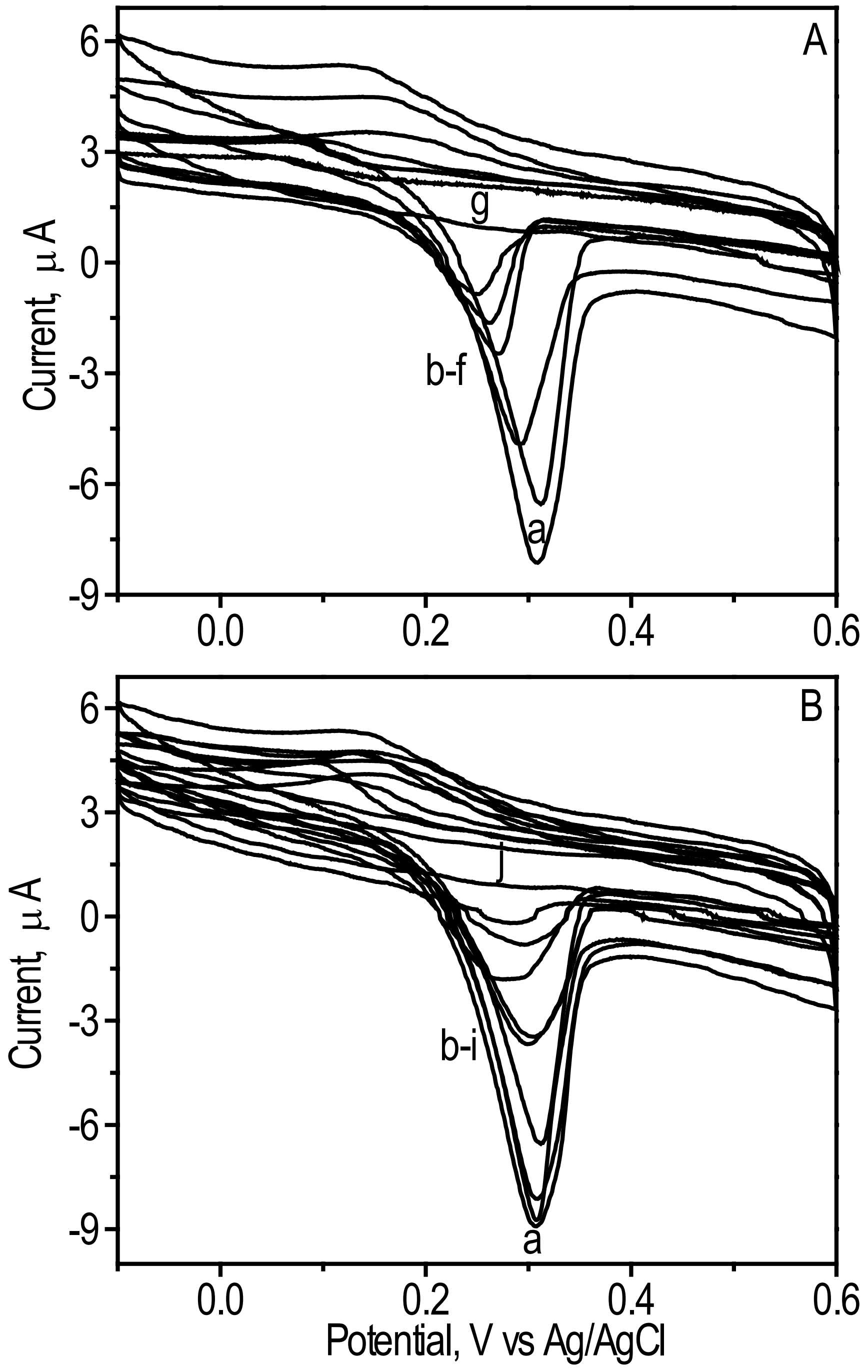
Supporting Information 1



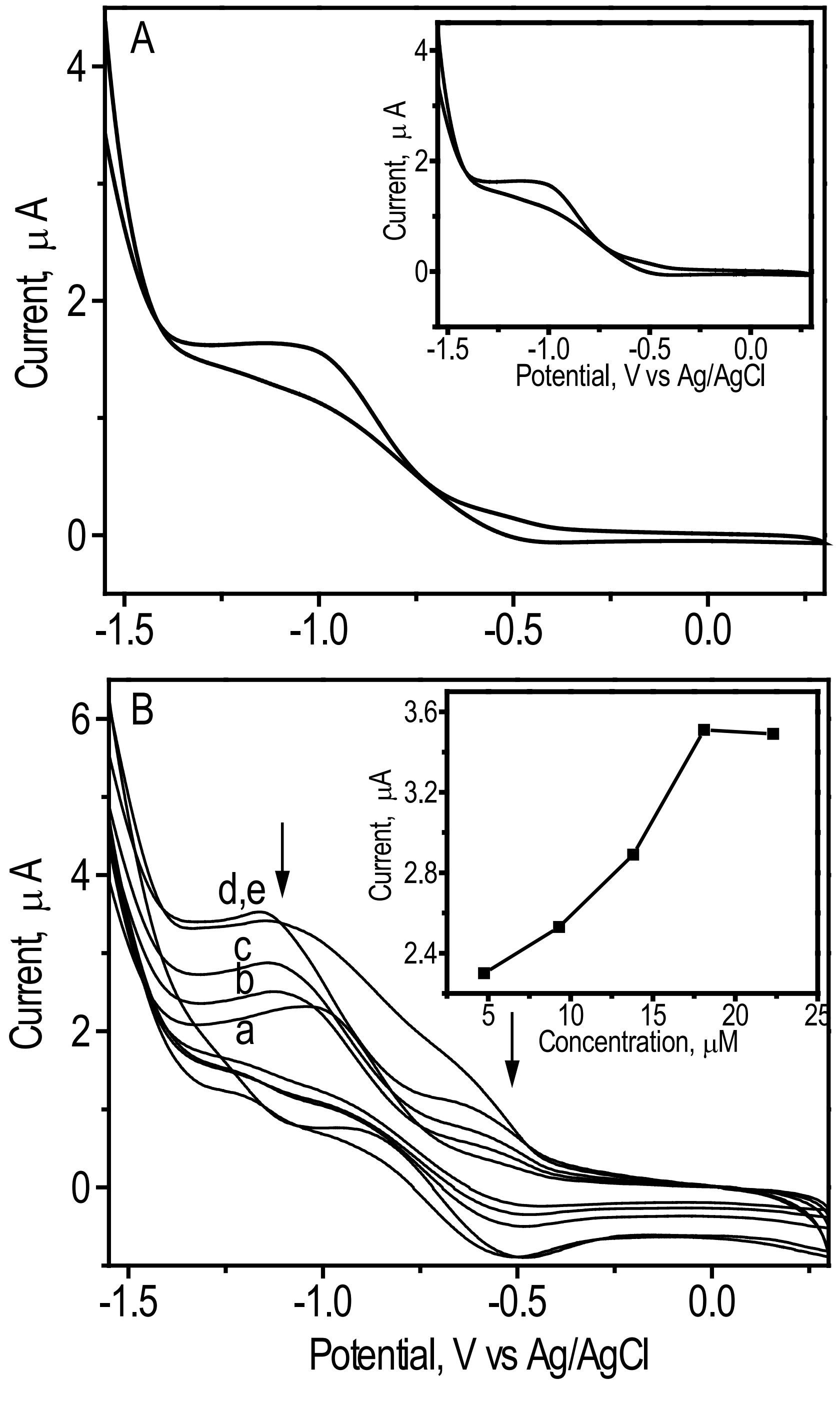
The UV-visible spectra showing the emergence of a peak corresponding to Au^{3+} in the reaction between Au@TiO_2 and benzyl chloride. Trace *a* is the absorption spectrum of $HAuCl_4.3H_2O$ in water and *b* is that of the reaction product of the above reaction. The shift in absorbance maximum (from 292 nm to 319 nm) may be attributed to the change of solvent (from water to 2-propanol) and the presence of nano-TiO_2 in the reaction medium.

Supporting Information 2



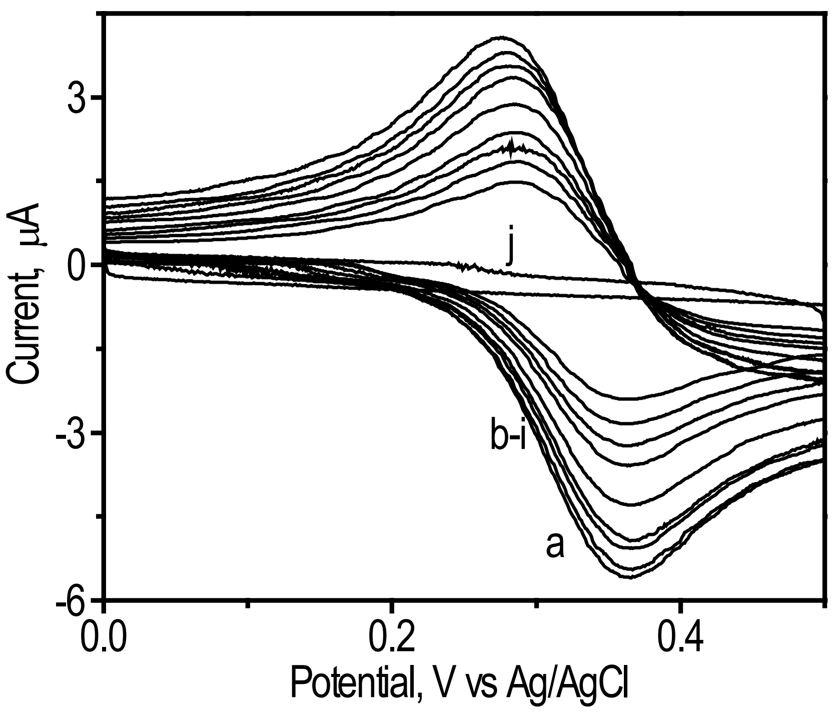
Time dependent CV of Ag@ZrO_2 on Pt electrode showing the effect of addition of 100 μl of A) 1-bromo hexane and B) 1-bromo dodecane. The voltammetric curve *a* is that of pure Ag@ZrO_2, others are taken at a time interval of 15 minutes after the addition of reactants. Other experimental conditions are same as that of Figure 2.

Supporting Information 3



A. CV of free N3 dye taken in CH_3CN containing TBAHFP on Pt electrode at a sweep rate of 300 mV $s^{-1.}$ Inset shows CV of the adsorbed dye on Au@TiO_2 taken at a slow sweep rate of 20 mV s^{-1}. B. CV showing the effect of exposure of different concentrations of N3 dye on Au@TiO_2 at constant sweep rate of 300 mV s^{-1}, (concentration in M) *a* = 4.75 X 10^{-6}, *b* = 9.3 X 10^{-6}, *c*= 13.8 X 10^{-6}, *d* = 18.1 X 10^{-6}, *e* = 22.3 X 10^{-6}. Inset shows the plot of peak currents against concentrations of N3 dye added to $Au@TiO_2$ cluster solution at a constant sweep rate of 300 mV s^{-1}. Arrow at –0.57 V shows the pre-wave and another one at –1.04V shows the redox couple of Ru (II/III).

Supporting Information 4



Time dependent CV of Au@SiO2 nanoparticles having a shell thickness of 60-80 nm upon reaction with benzyl chloride. Curve *a* shows CV in the absence of the reactant and others in presence taken at a time interval of 30 minutes. Complete quenching of the redox peak is found to occur after 14 hrs and 25 minutes. Other conditions are same as that of Figure 5.