Electronic Supplementary Material (ESI) for RSC Advances

Halide ion induced tuning and self organization of Gold Nanostars

Abhitosh Kedia, P. Senthil Kumar
Department of Physics and Astrophysics, University of Delhi, Delhi-110007, INDIA

Supplementary Information

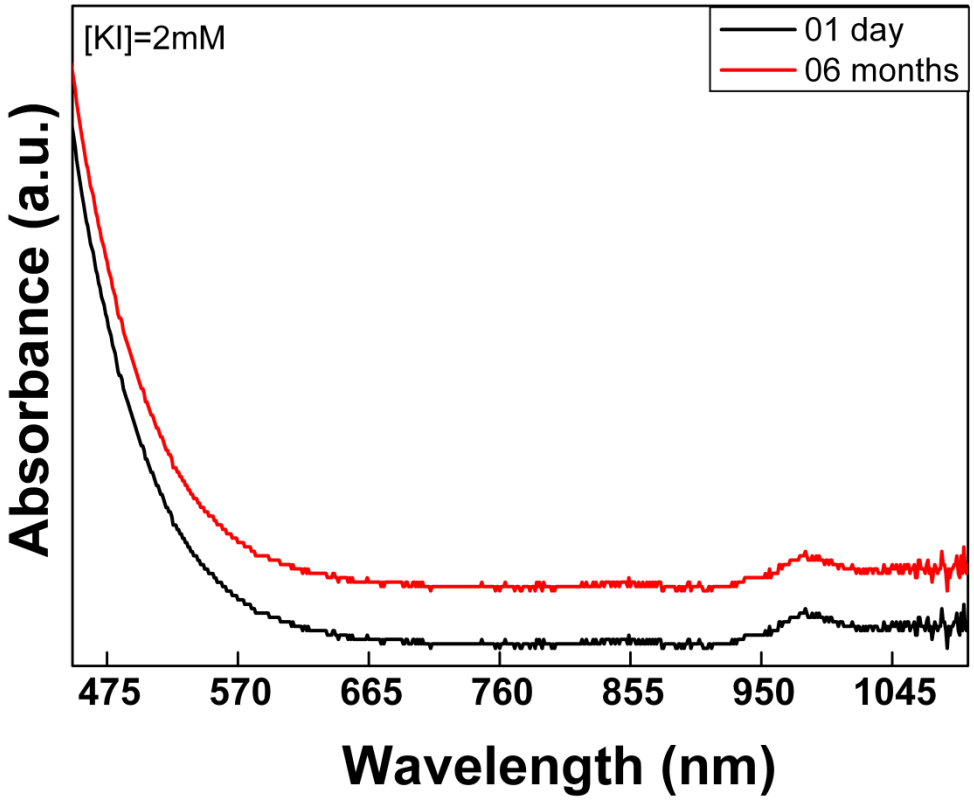

Figure S1: UV-Vis spectra confirms that the addition of KI=2mM (added in DMF-PVP complex) clearly constrain the nucleation as well as growth of Au nanoparticles.

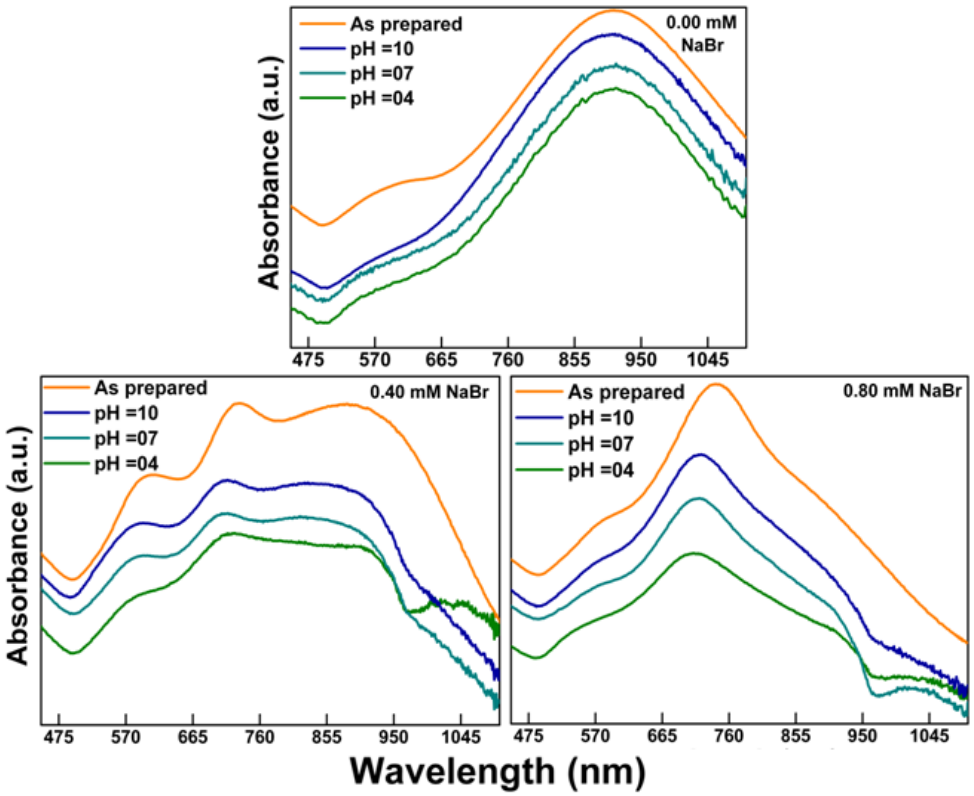

Figure S2: shows the optical spectra of Au nanostructures prepared at different reaction condition under various pH conditions. The unchanged surface plasmon peaks at different pH indicate the stability of nanostructures. The centrufuged samples are redispersed in different buffer solution and then their optical spectra are recorded. A small dip around 960 nm is due to water-DMF complex.

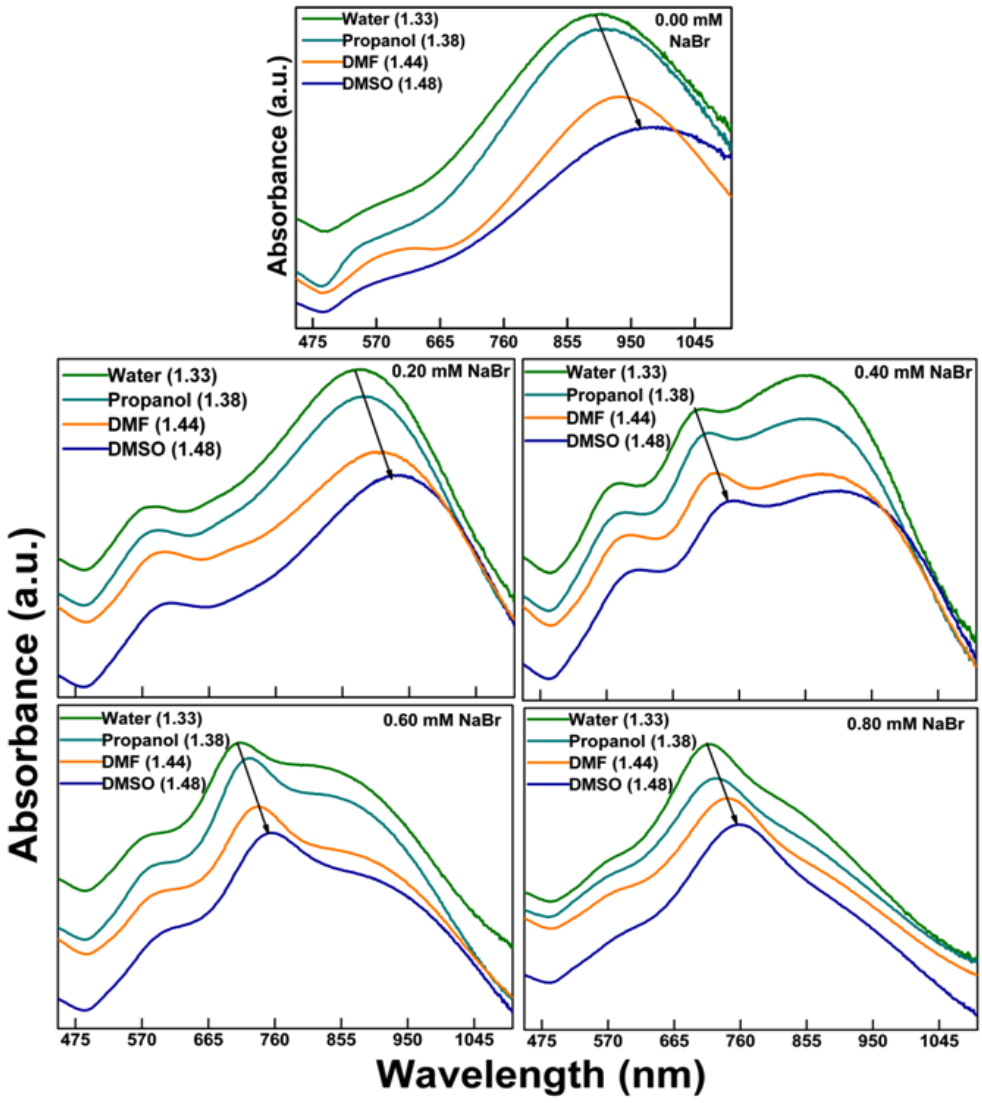

Figure S3: Optical spectra of gold nanostructures at different NaBr concentration in different solvent showing the linear shifts in LSPR peak position with respect to different refractive indices, which demonstrate that the as-formed Au nanostructures are highly stable in different dielectric environments. (The optical spectra were recorded using the thrice centrifuged pellets of the as-prepared Au nanoparticles and dispersing them in different solvents).

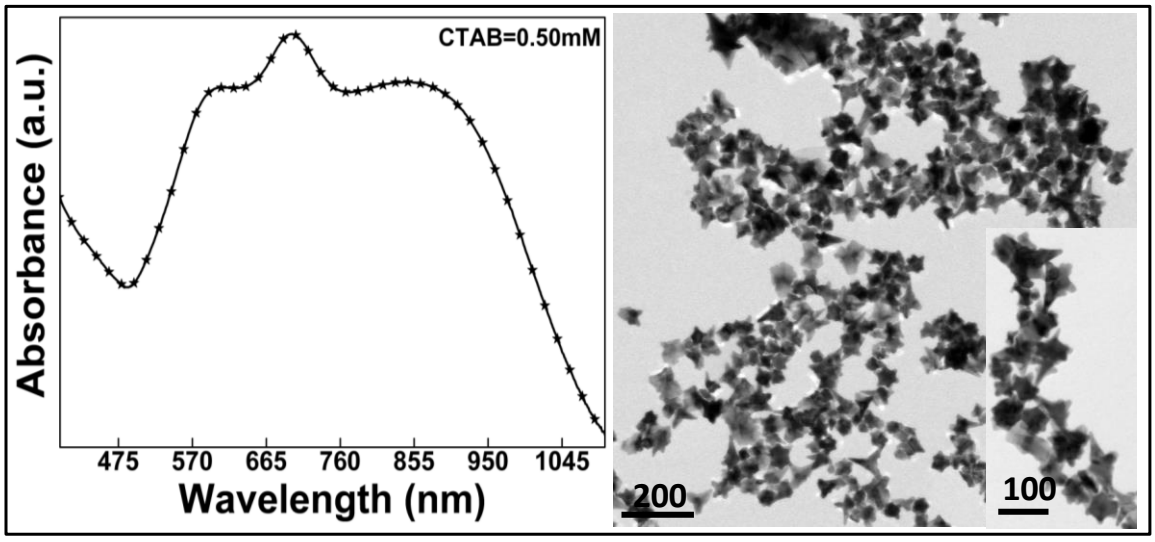

Figure S4: The effect of addition of CTAB into the DMF-PVP complex resulting in the formation of self-organized anisotropic gold nanostructures as revealed by the optical absorption spectra and their corresponding TEM images (scale bar is in nm).

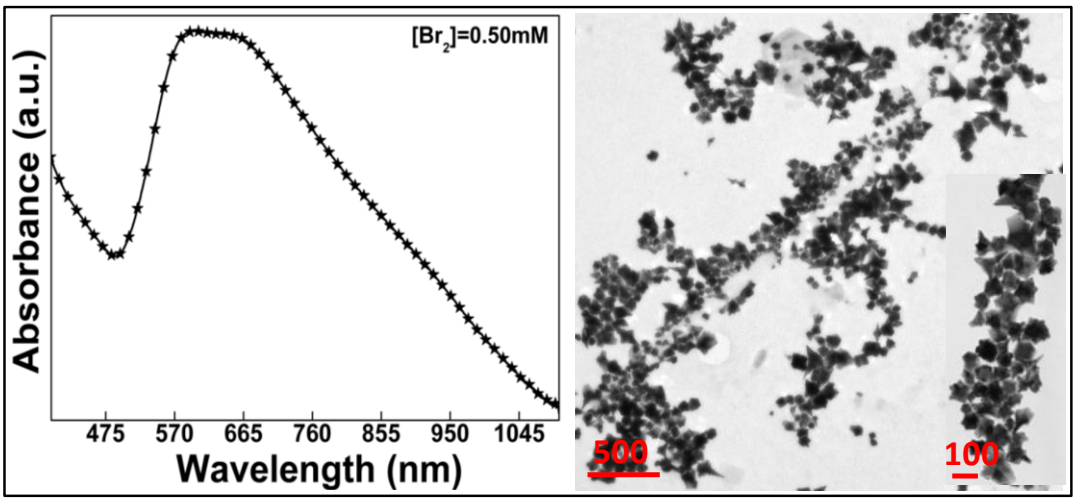

Figure S5: Optical absorption spectra and their corresponding TEM images (scale bar is in nm) reveal that addition of Br_2 into the DMF-PVP complex resulting in the formation of self-organized anisotropic gold nanostructures.

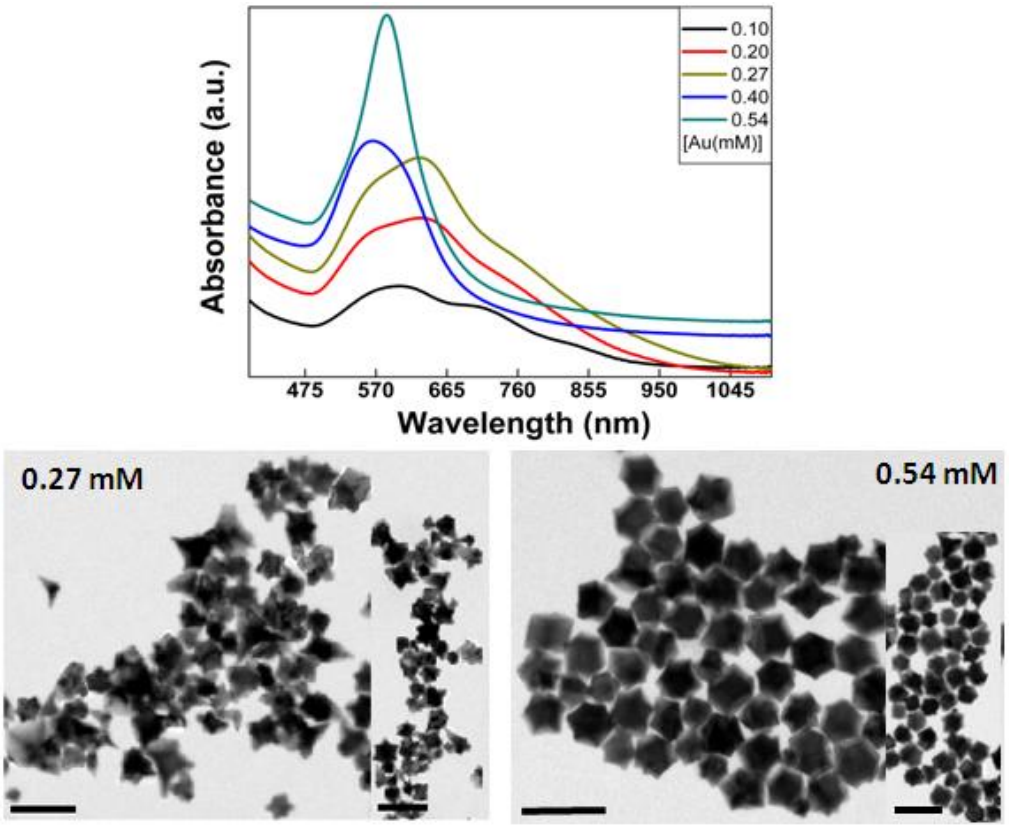

Figure S6: With K_2AuBr_4 as the gold precursor in the pristine DMF-PVP (PVP 10 mM) complex, the systematic formation of anisotropic gold nanostructures with different Au ion concentration is clearly shown in the optical absorption spectra along with their respective TEM images (Scale bar 200 nm, inset 200 nm). Note the closely spaced anisotropic gold nanostructures signify the PVP-Br-Au interaction.

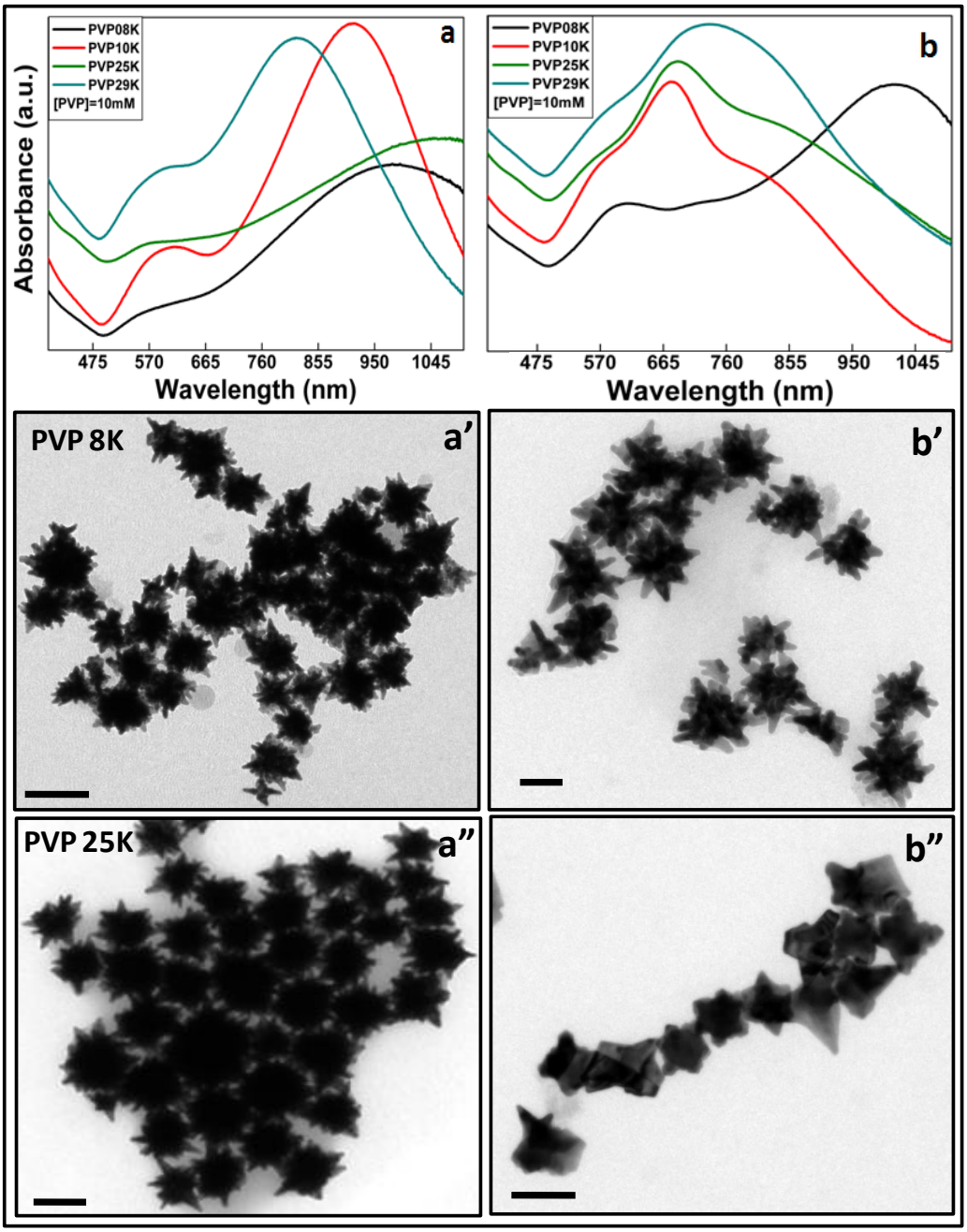

Figure S7: (a, b) UV-Vis spectra and TEM images (a', a") without NaBr (b', b") with 0.50mM NaBr (added in DMF-PVP complex) with PVP 8K and 25K respectively showing the effect of PVP molecular weight on gold nanostructures.

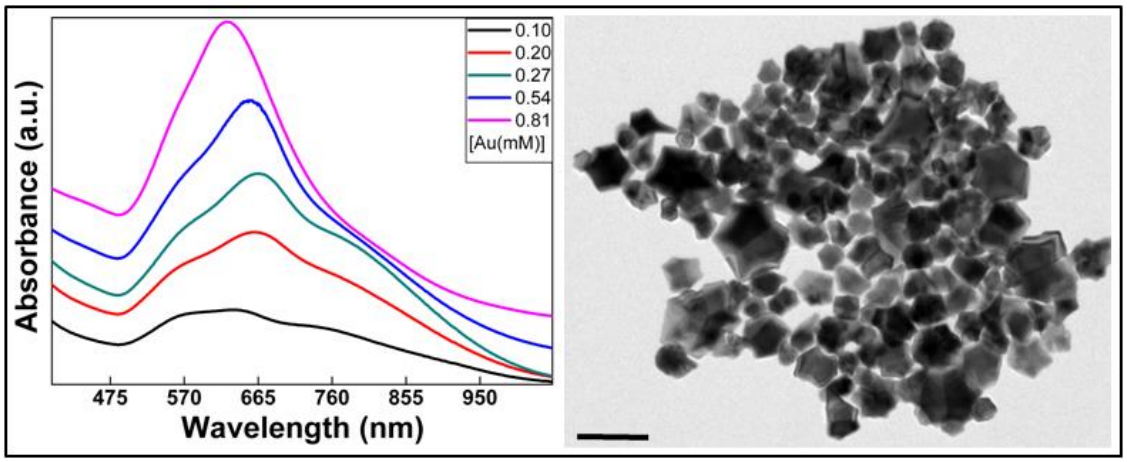

Figure S8: UV-Vis spectra showing the effect of gold concentration at PVP 10mM concentration with 0.50 mM NaBr (added in DMF-PVP complex) on gold nanostructures and representative TEM (scale bar 100 nm) for a gold concentration of 0.81 mM.

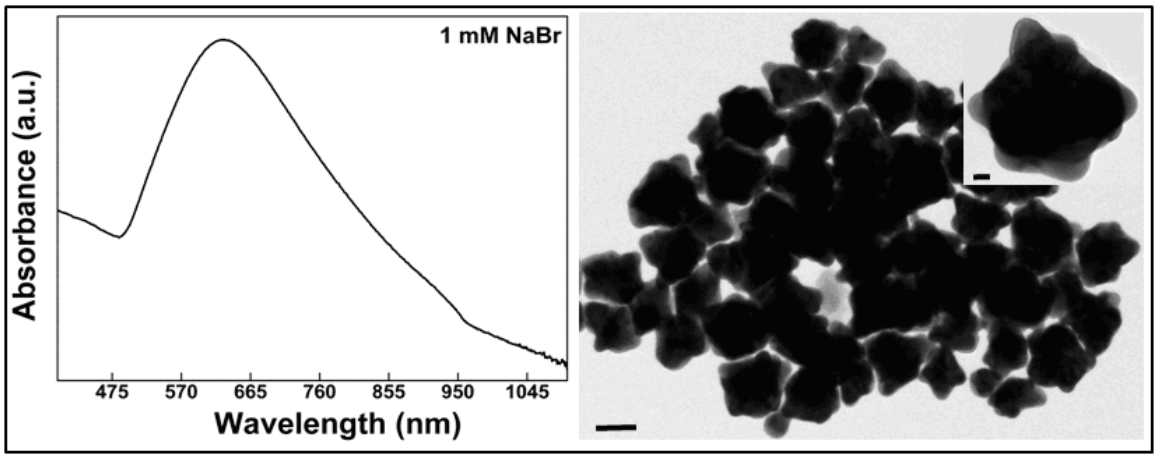

Figure S9: UV- Vis spectra and corresponding TEM images (scale bar 100 nm, inset 20 nm) of reshaped gold nanostars in the presence of 1 mM of NaBr,