Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supplementary Information to

Controlling an Electrostatic Repulsion by Oppositely Charged Surfactants Towards Positively Charged Fluorescent Gold Nanoclusters

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Experimental

1. Materials:

$HAuCl_4$, sodium hydroxide (NaOH) (Junsei Chemicals Co., Ltd.), sodium borohydride ($NaBH_4$) (Kanto Chemicals Co., Inc), methanol (Junsei Chemicals Co., Ltd.), sodium dodecylsulfate (SDS) (Kishida Chemical Co. Ltd.),

2. Characterization:

UV Vis extinction measurement (Jasco V-630 spectrometer), fluorescence measurement (Jasco FP-6600),particle size analysis: TEM (JEOL FX 2000, acceleration voltage of 200 kV) and STEM-HAADF (FEI TITAN III G2-Cubed,acceleration voltage of 300 kV).

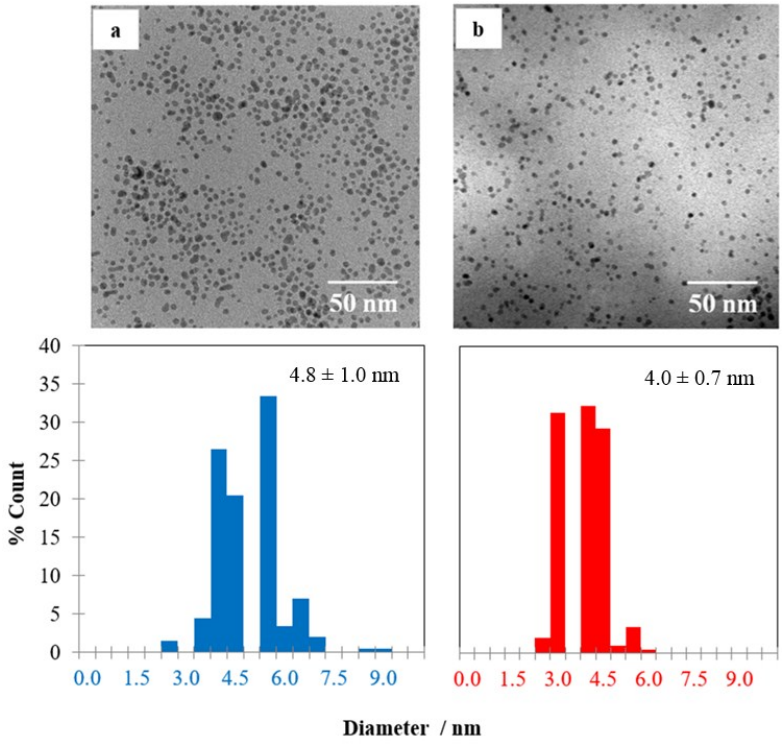

Figure S1.TEM images and particle size distributions of obtained Au nanoparticles synthesized under the mol ratio of Au:TC = 1:3 (a) and 1:5 (b).

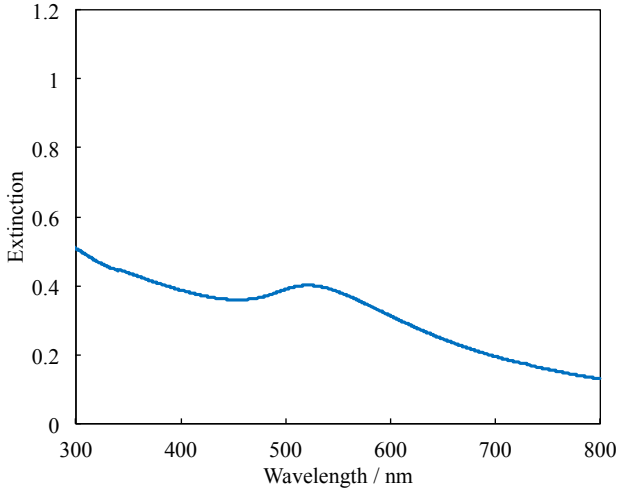

Figure S2. Extinction spectra of obtained Au nanoparticles synthesized at Au:TC:SDS = 1:3:3.

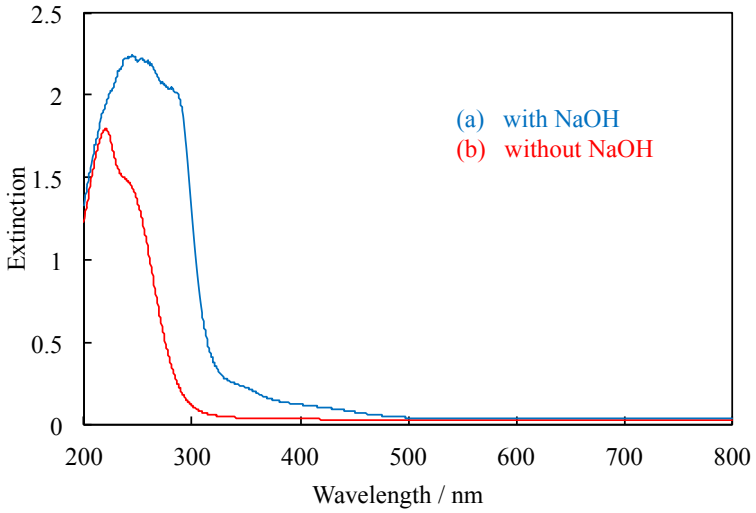

Figure S3. Extinction spectra of obtained Au nanoclusters with and without NaOH.

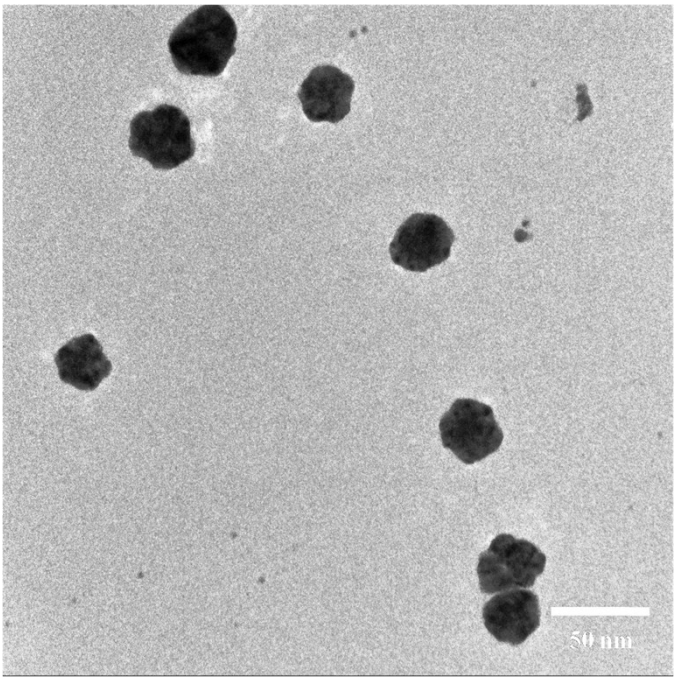

Figure S4. Large aggregates of particles (~20 nm) were obtained after synthesizing gold nanoparticles using SDS alone without TC.

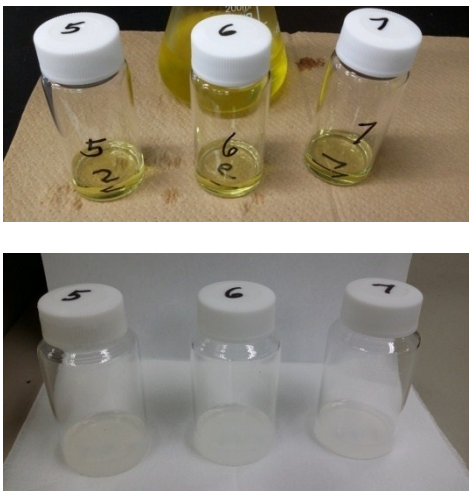

Figure S5. Changes in color before (top) and after (bottom) the addition of TC into $HAuCl_4$.