Supplementary Information for:

Self-assembled semiconductor capped metal composite nanoparticles embedded in $BaTiO_3$ thin films for nonlinear optical applications

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By this route in our paper, CdS coated gold composite nanoparticles were also prepared and integrated into $BaTiO_3$ films. Fig. 1 is the TEM micrograph of Au@CdS core-shell nanoparticles incorporated into $BaTiO_3$ film. CdS coated gold composite nanoparticle is clearly shown in the inset. Fig. 2 is grazing-incident small-angel XRD pattern of this film. The *d* spacings of 2.36, 2.04 and 2.06 (*Å*) are indexed to the (111), (200) planes of Au fcc and the (220) plane of CdS cubic zinc blende structure, respectively. Fig.3 is the Uv-vis absorption spectra o Au@CdS/$BaTiO_3$ films heat-treated at different temperature. These curves have onsets in the 480-500 nm wavelength range, which are attributed to absorption edges of CdS nanocrystals. Those peaks near 590 nm are attributed SPR of gold nanoparticles.

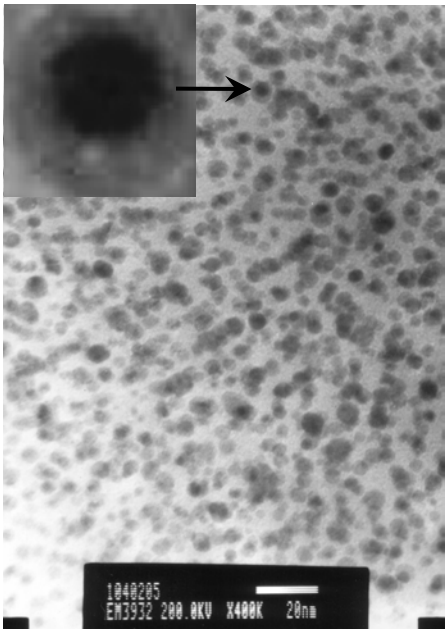

Fig. 1 TEM micrograph of Au@CdS core-shell nanoparticles incorporated into $BaTiO_3$ film by this route. The inset is an enlarged view of one Au@CdS core-shell nanoparticle.

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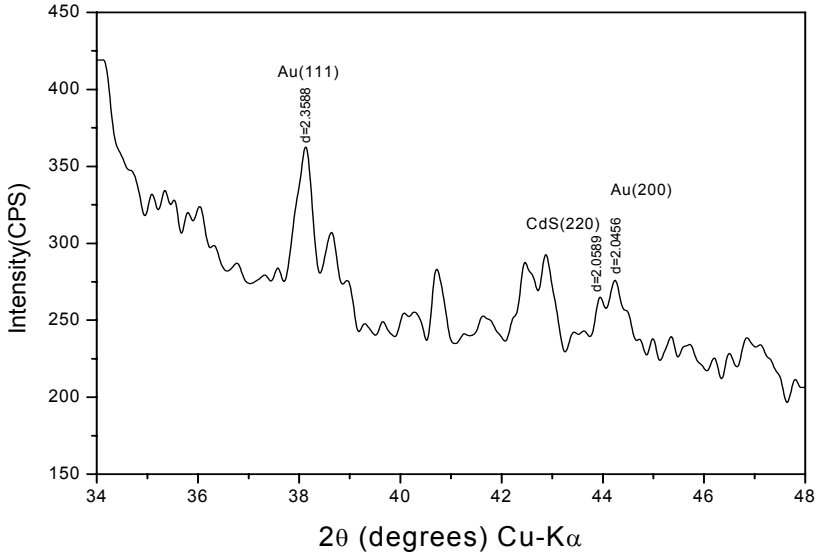
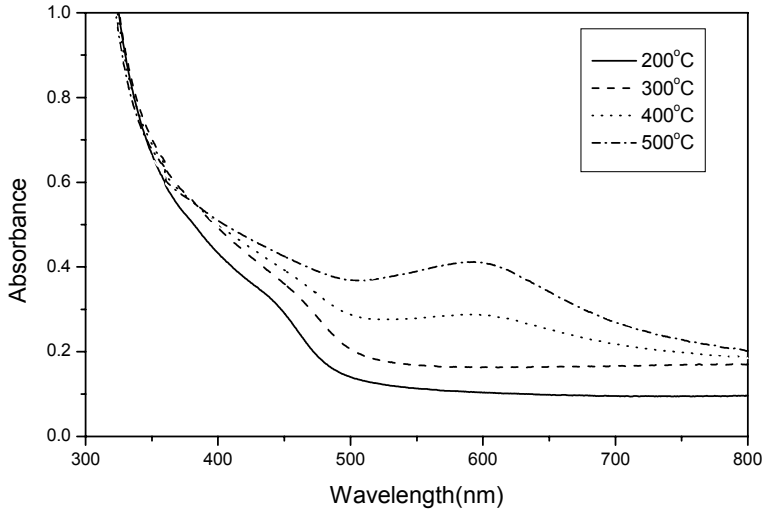


Fig. 2 Grazing-incident small-angel XRD pattern of Au@CdS/$BaTiO_3$ film.



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