Supporting Information

Extended Short-wavelength Infrared Photoluminescence and Photocurrent of Nonstoichiometric Silver Telluride Colloidal Nanocrystals

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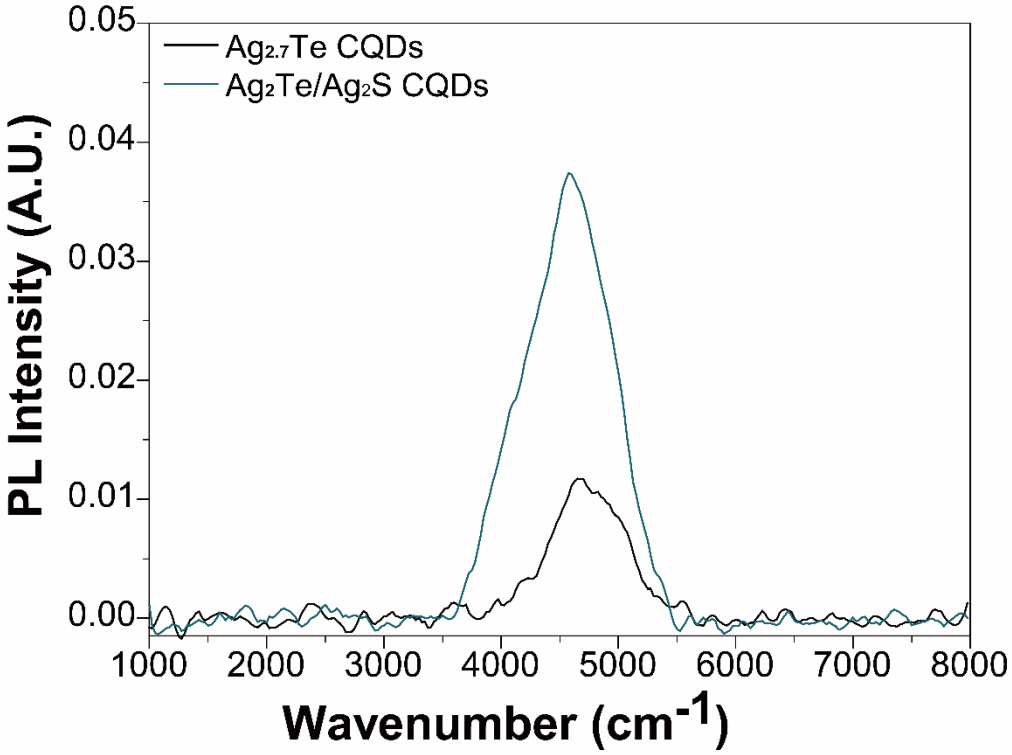

Figure S1. PL spectra of $Ag_{2.7}Te$ CQDs and Ag_2Te/Ag_2S CQDs.

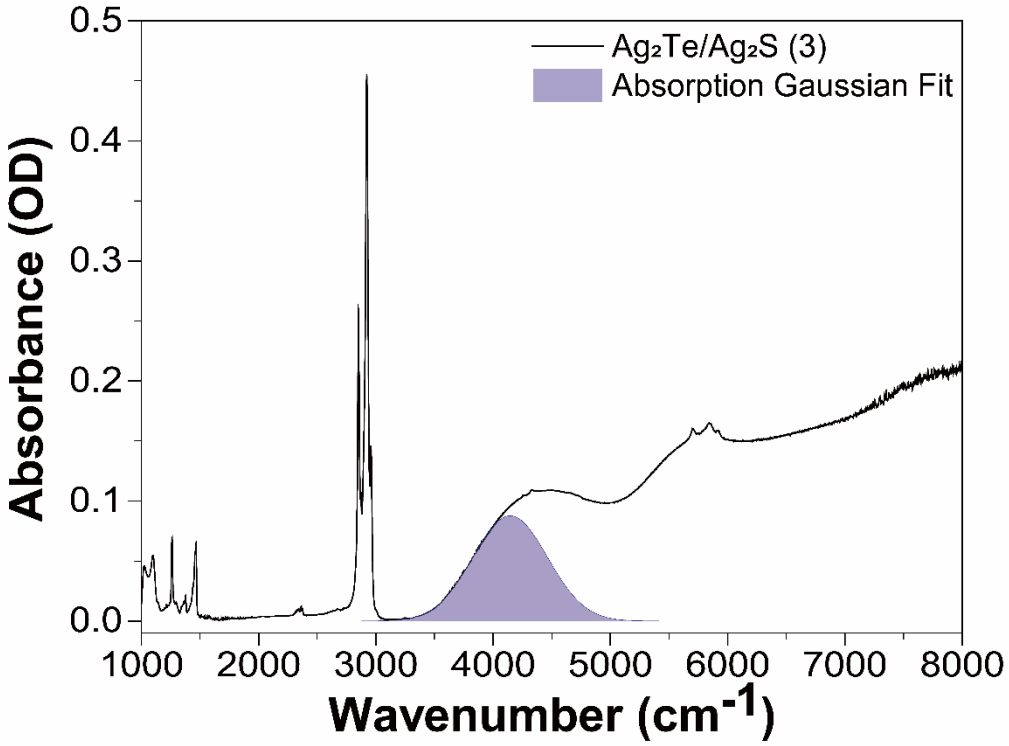

Figure S2. Absorption spectrum of Ag_2Te/Ag_2S (3) with absorption Gaussian fit.

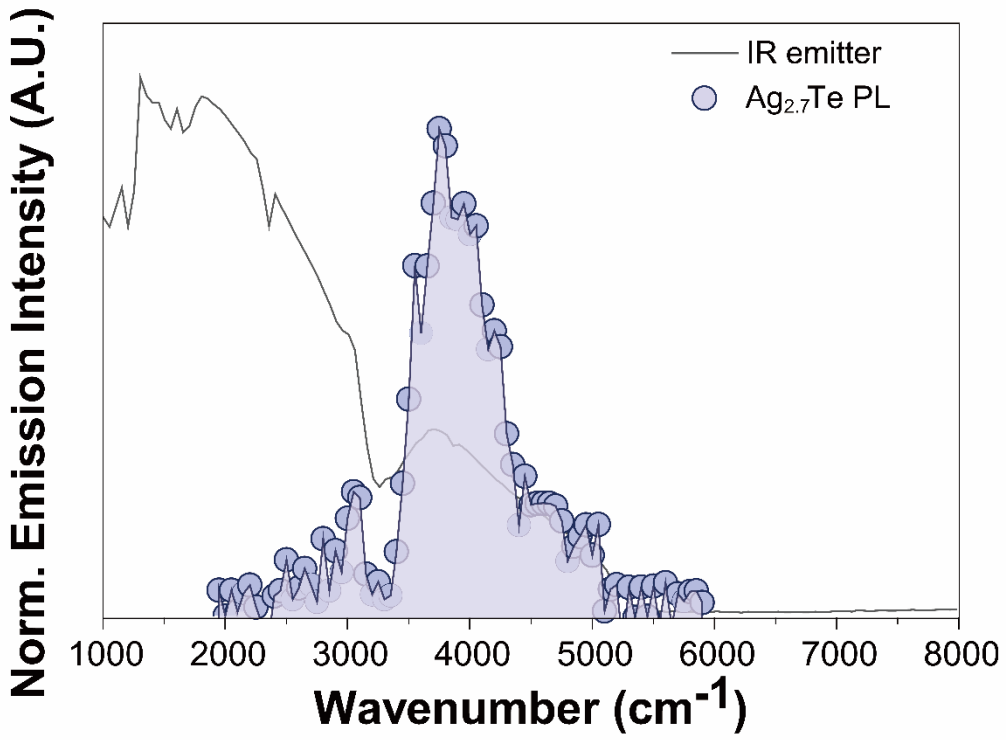

Figure S3. The PL spectrum of $Ag_{2.7}Te$ QDs with the blackbody radiation of the IR globar emitter.

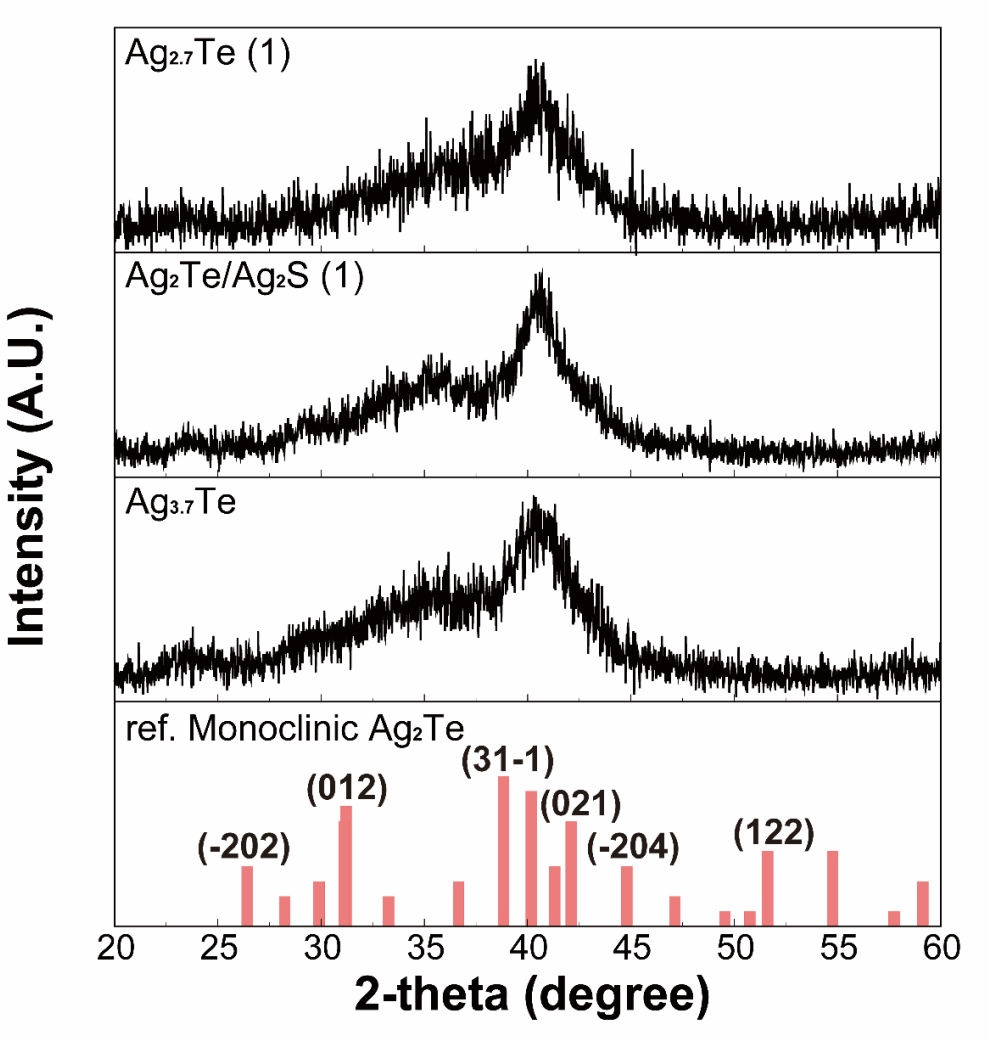

Figure S4. XRD spectra of $Ag_{2.7}Te$ (1), Ag_2Te/Ag_2S (1), $Ag_{3.7}Te$ CQDs, and reference of monoclinic Ag_2Te.

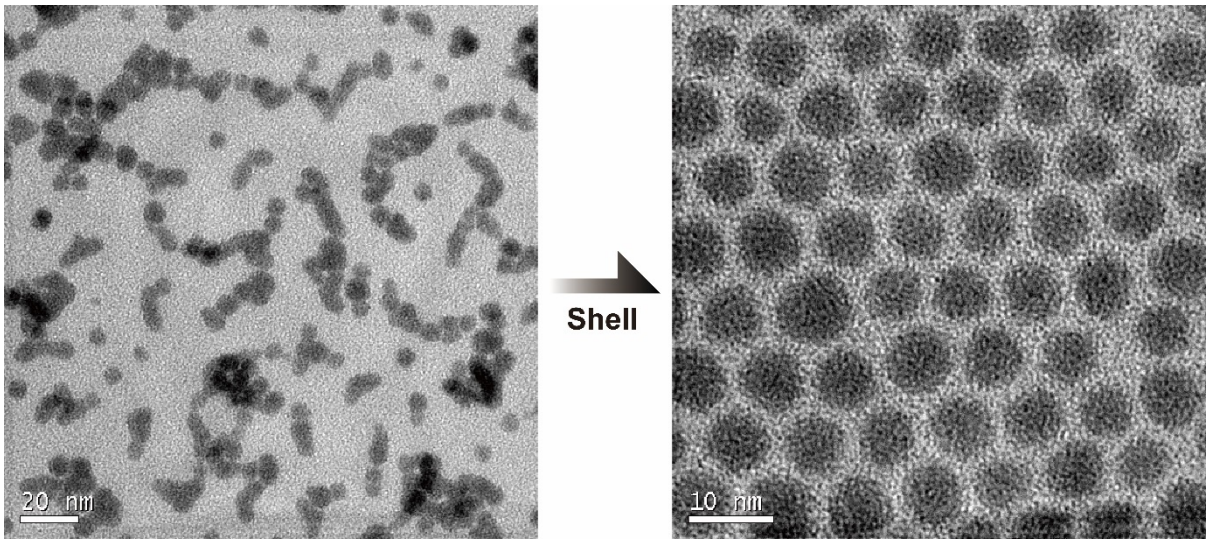

Figure S5. TEM images of $Ag_{2.7}Te$ and Ag_2Te/Ag_2S QDs. By growing the Ag_2S shell, the deformation of crystal is significantly suppressed under e-beam irradiation.

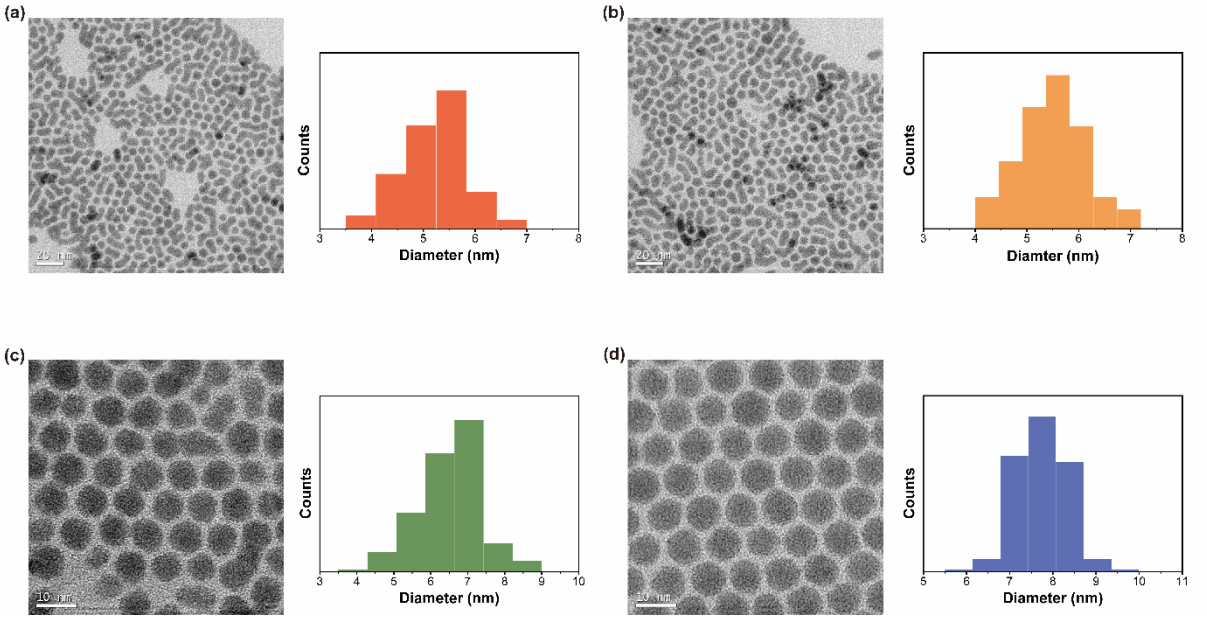

Figure S6. The TEM images of Ag_2Te/Ag_2S QDs (1) 5.2±0.6 nm, (2) 5.5±0.7 nm, (3) 6.5±0.8, and #4 7.7 nm ±0.6.

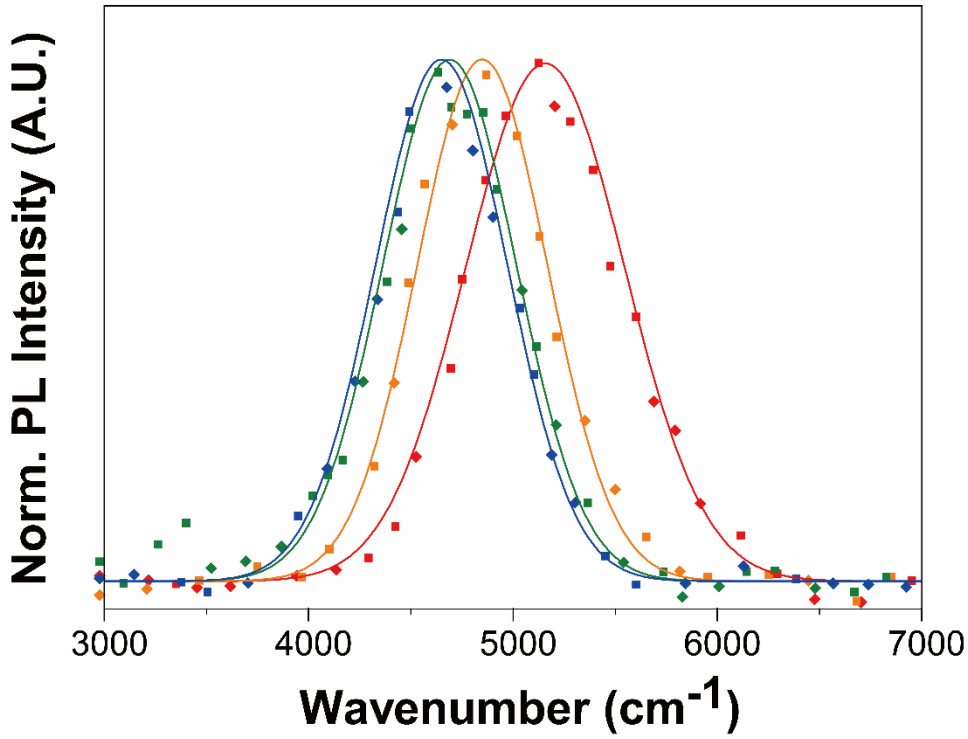

Figure S7. Normalized infrared photoluminescence spectra of $Ag_{3.7}Te$ CQDs and corresponding Gaussian fit functions.

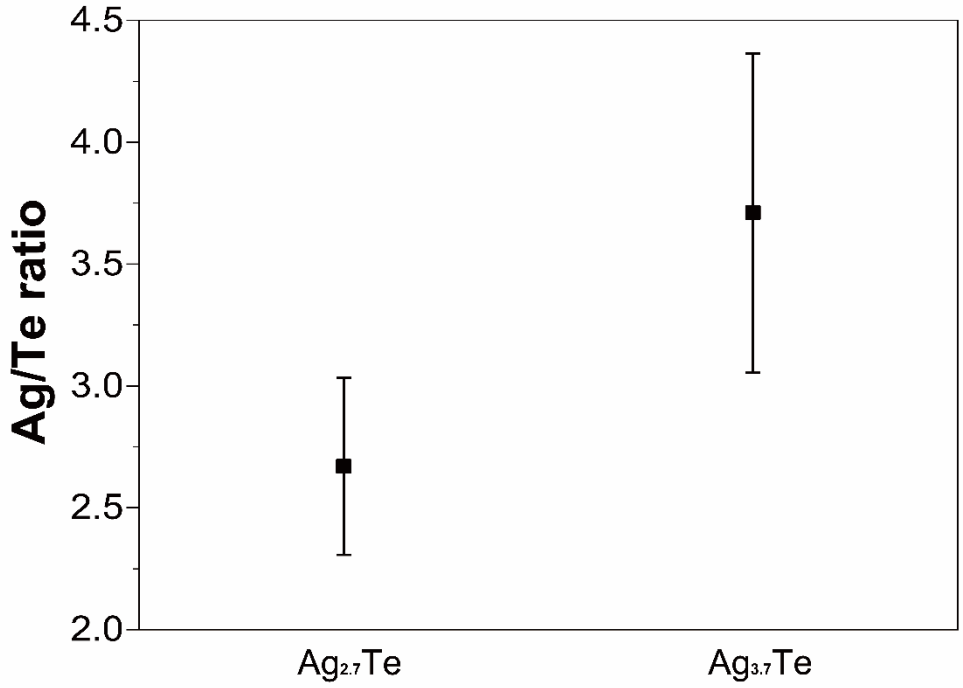

Figure S8. Ag/Te ratio of $Ag_{2.7}Te$ and $Ag_{3.7}Te$ CQDs.

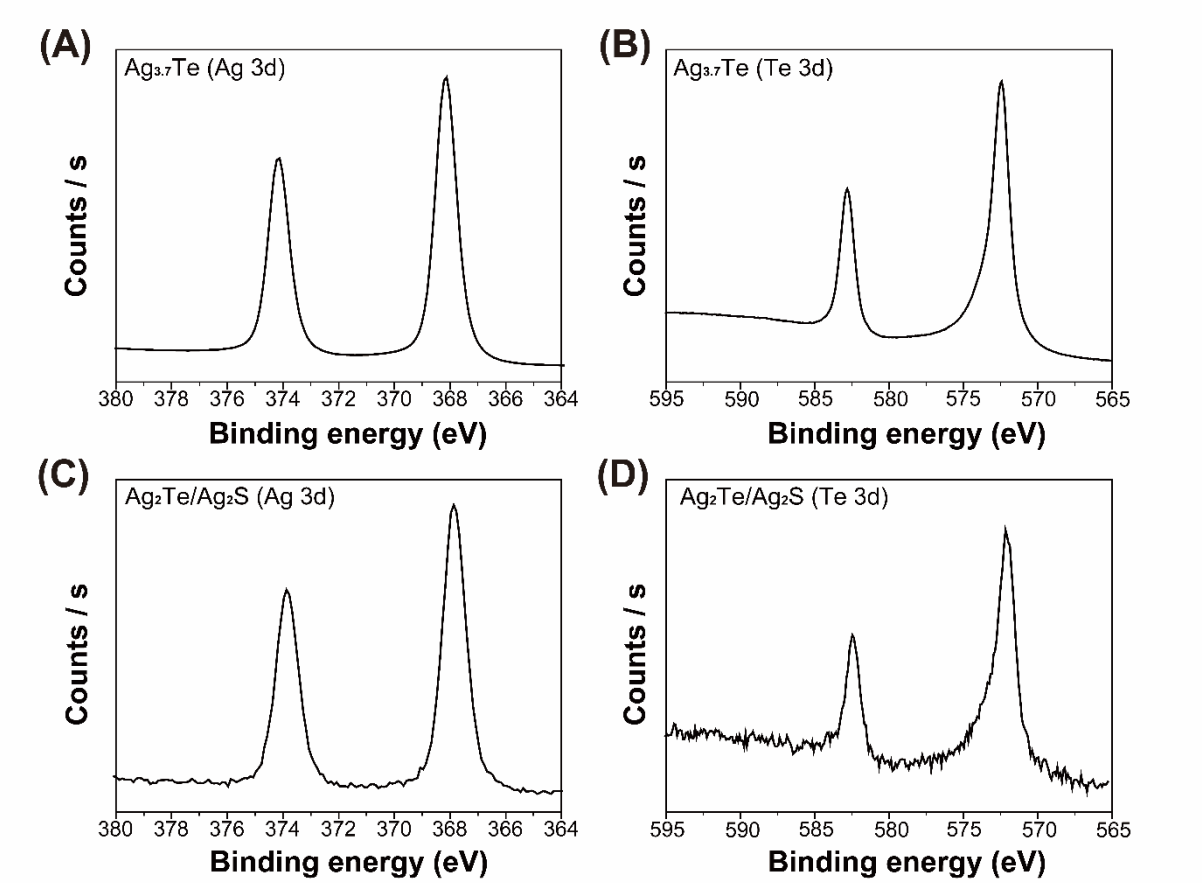

Figure S9. XPS spectra of (A) Silver 3d and (B) Tellurium 3d scan of $Ag_{3.7}Te$ QDs (C) Silver 3d and (D) Tellurium 3d scan of Ag_2Te/Ag_2S QDs.

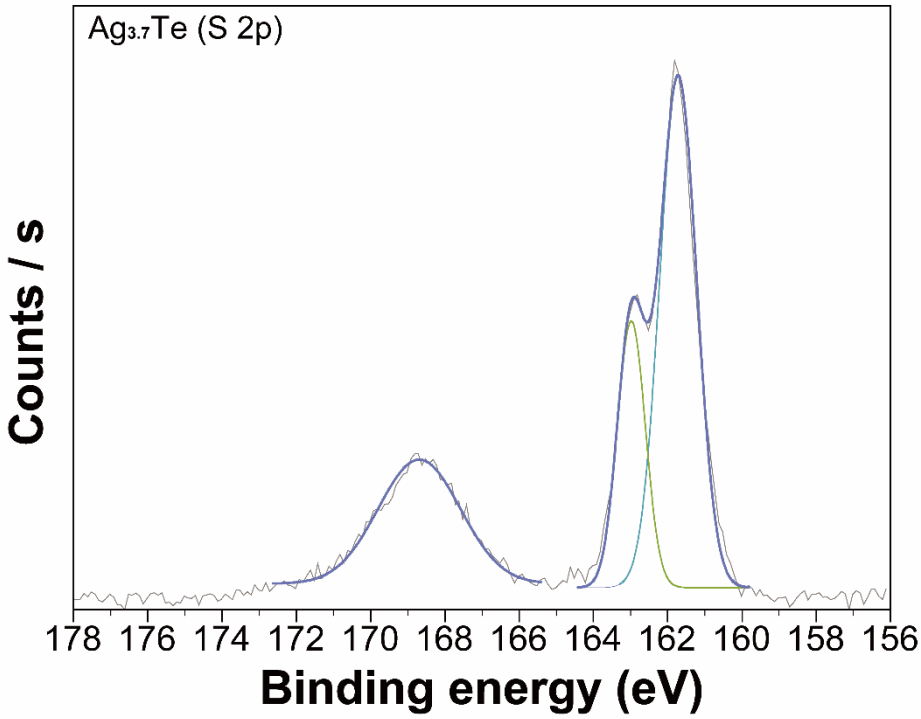

Figure S10. XPS spectrum of S 2p of $Ag_{3.7}Te$ QDs with Gaussian fit functions.

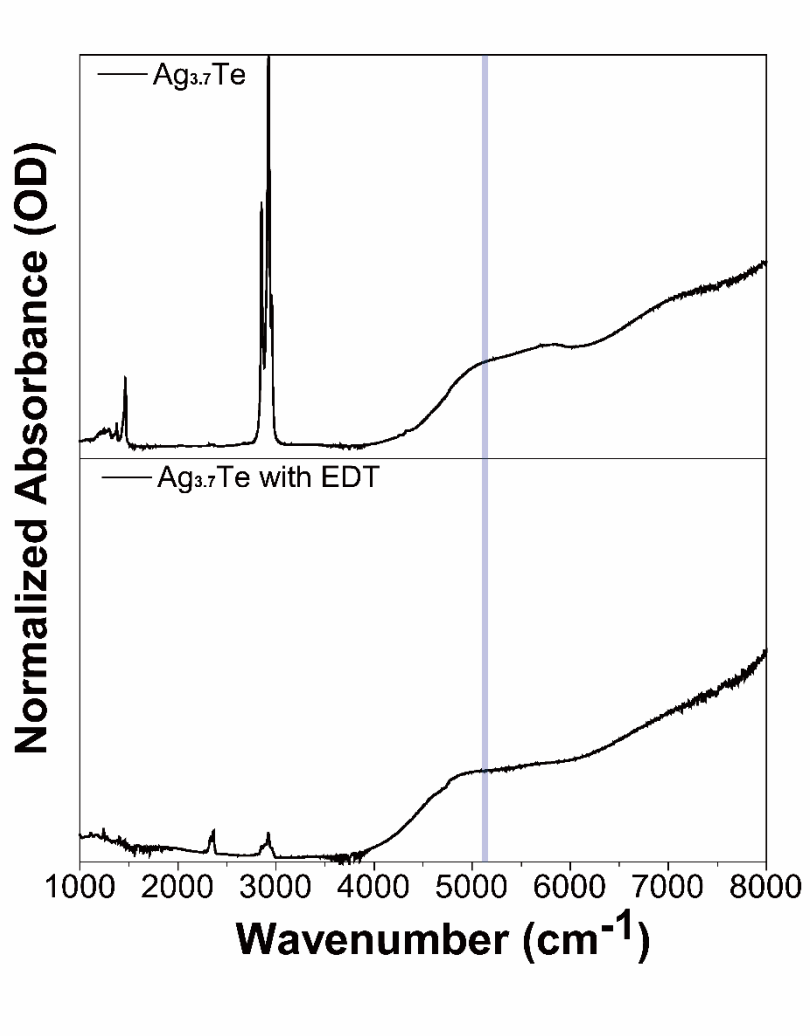

Figure S11. Absorption spectra of $Ag_{3.7}Te$ QDs before and after exchange the ligand to ethanedithiol (EDT).

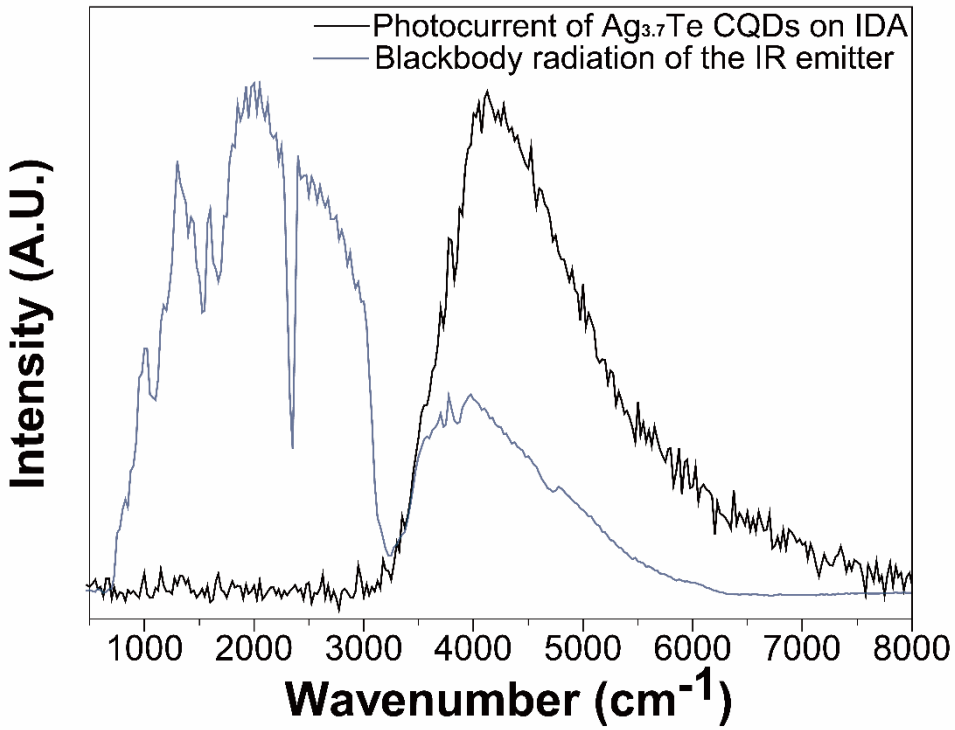

Figure S12. The infrared photocurrent spectrum of $Ag_{3.7}Te$ CQDs on IDA electrode and the blackbody radiation of the IR emitter.

Figure S12 shows the comparison between the photocurrent spectra and the blackbody radiation of the IR emitter. At 6000-8000 cm^{-1}, the intensity of the blackbody radiation becomes weaker. Since the blackbody radiation attenuates at higher wavenumber, the spectrum in Fig. 4C follows the tail of the blackbody radiation spectra although the absorption feature of the $Ag_{3.7}Te$ continuously increases with an increase of the frequency.