Electronic Supplementary Information (ESI)

Large-Scale Synthesis of Water-Soluble $CuInSe_2$/ZnS and $AgInSe_2$/ZnS Core/Shell Quantum Dots

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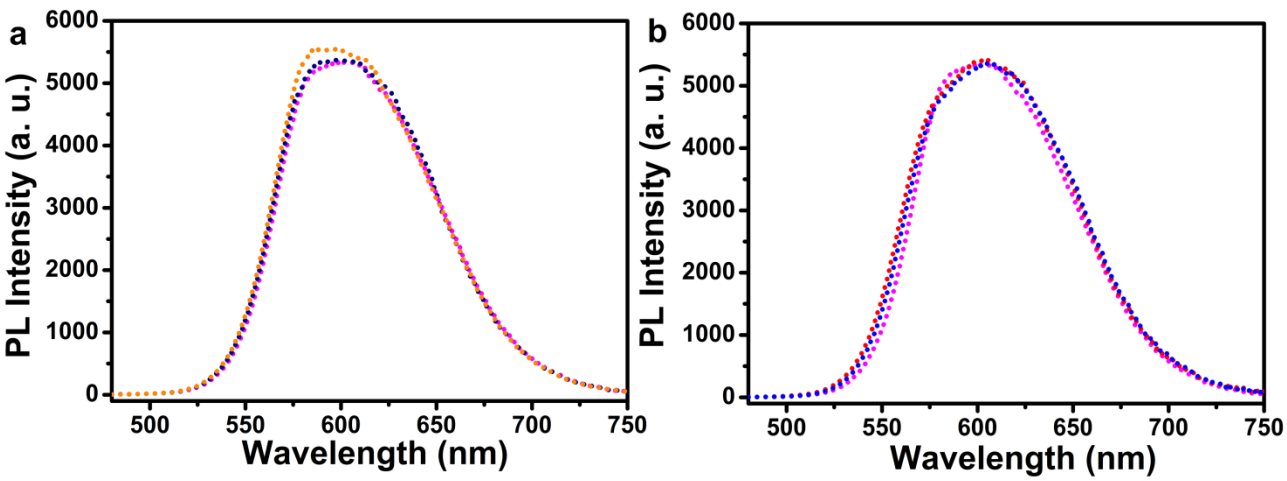

Figure S1. PL spectra of AISe/ZnS (Ag/In = 1/12) core/shell QDs synthesized in different electric pressure cookers (a) and in different batches which are synthesized in the same electric pressure cooker (b).

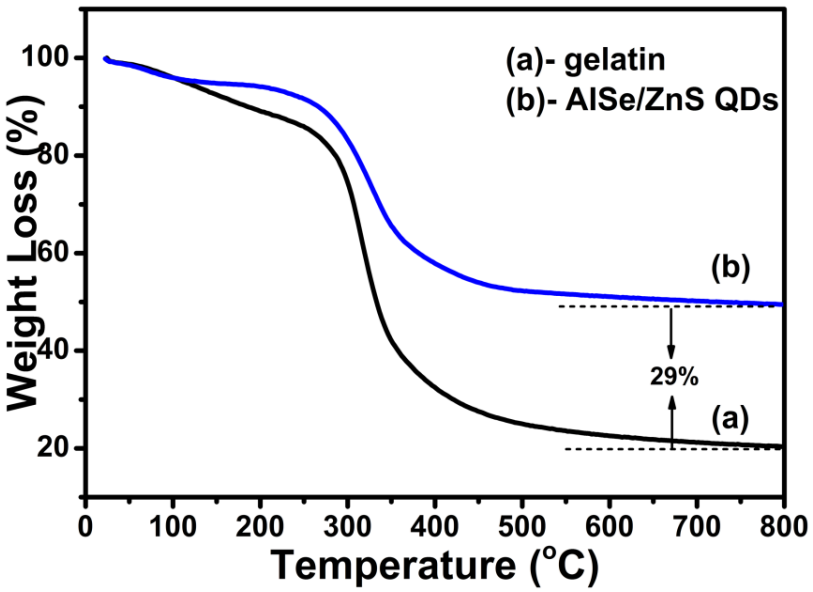

Figure S2. TG curves of pure gelatin (a) and AISe/ZnS (Ag/In=1/12) core/shell QDs (b).

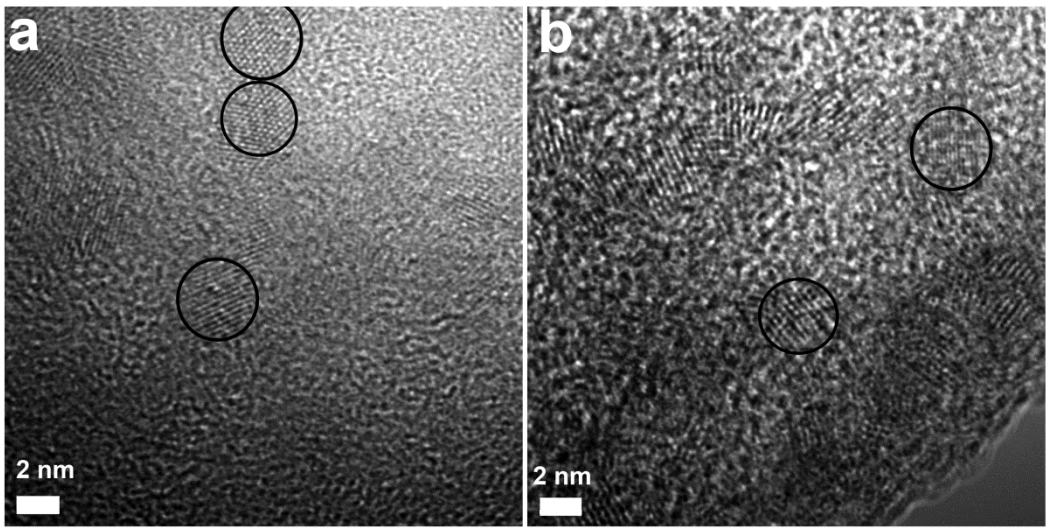

Figure S3 HRTEM images of CISe/ZnS (Cu/In=1/8) (a) and AISe/ZnS (Ag/In=1/8) (b) core/shell QDs.

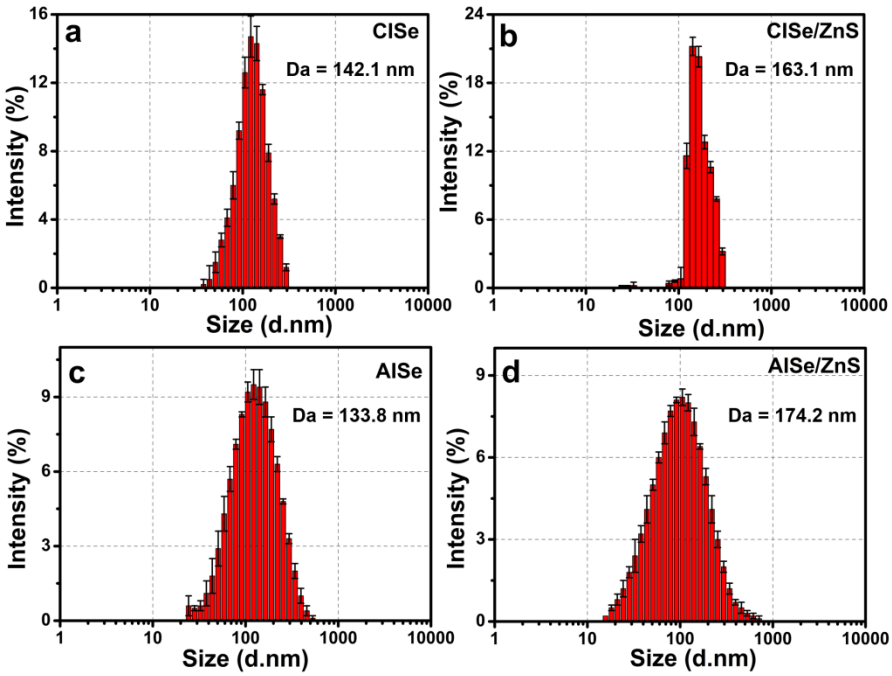

Figure S4 Particle size distributions of CISe cores (Cu/In=1/8) (a), the corresponding CISe/ZnS core/shell QDs (b), AISe cores (Ag/In=1/8) (c) and the corresponding AISe/ZnS core/shell QDs (d) in water, determined by dynamic light scattering (DLS).

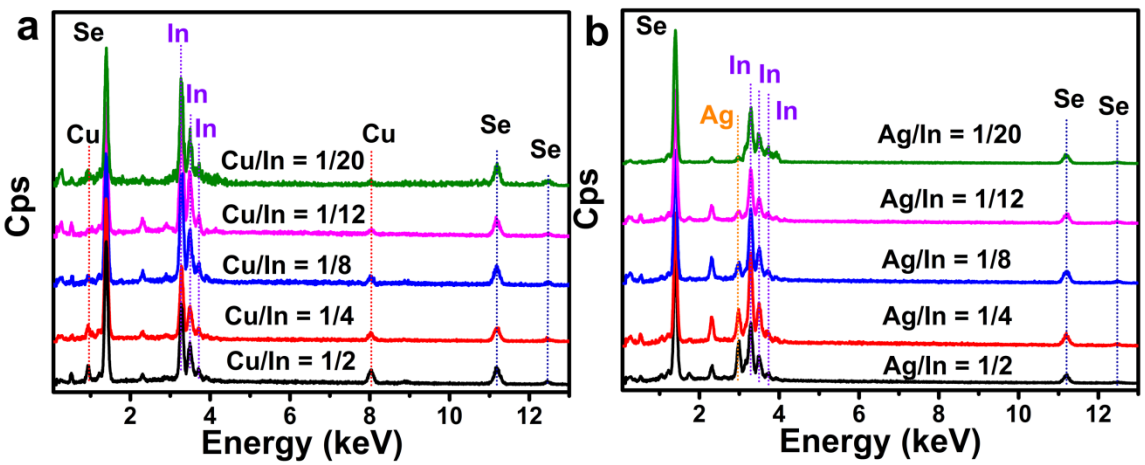

Figure S5 EDS spectra of CISe core QDs and AISe core QDs with different precursor ratios.

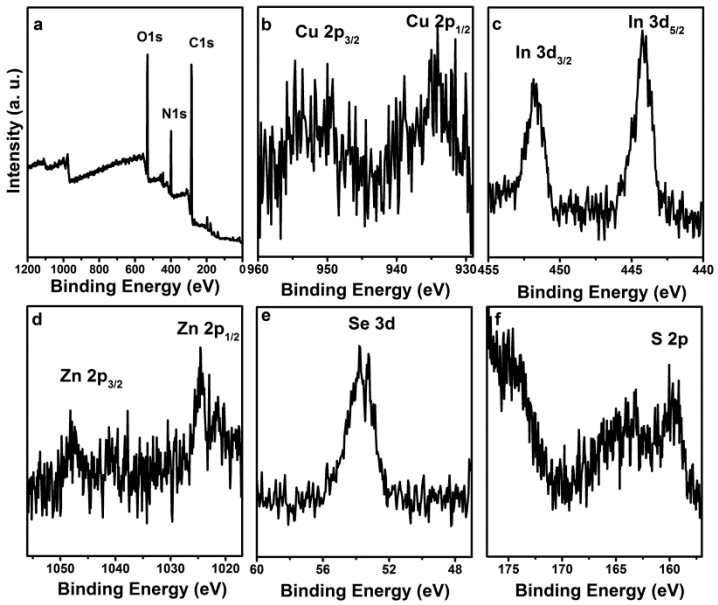

Figure S6 XPS analysis of the CISe/ZnS (Cu/In=1/8) core/shell QDs. (a) the survey-scan XPS picture and narrow-scan of the Cu 2p region (b), In 3d region (c), Zn 2p region (d), Se 3d region (e) and S 2p region (f).

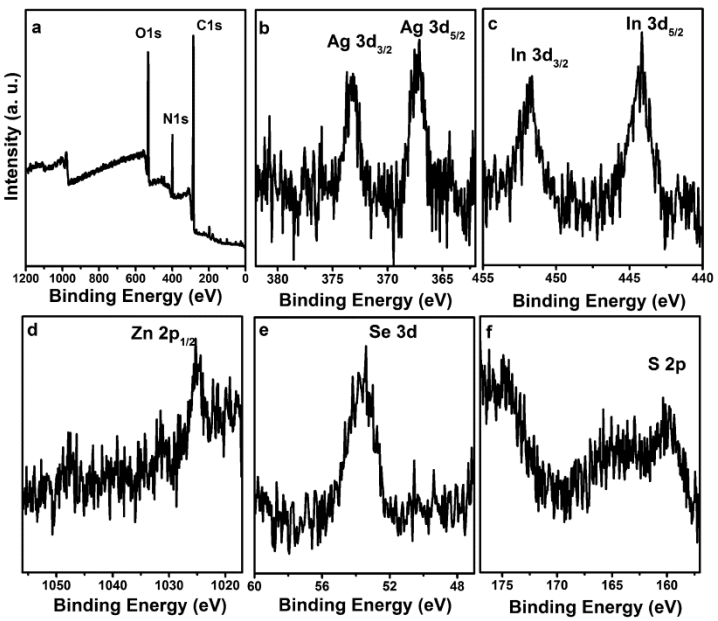

Figure S7 XPS analysis of the AISe/ZnS (Ag/In=1/8) core/shell QDs. (a) the survey-scan XPS picture and narrow-scan of the Ag 3d region (b), In 3d region (c), Zn 2p region (d), Se 3d region (e) and S 2p region (f).

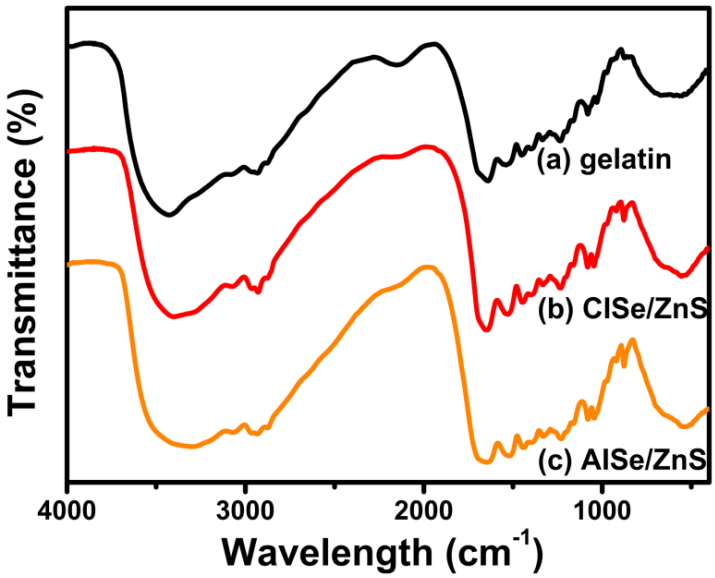

Figure S8 FT-IR spectra of pure gelatin (a), CISe/ZnS (b) and AISe/ZnS (c) core/shell QDs.

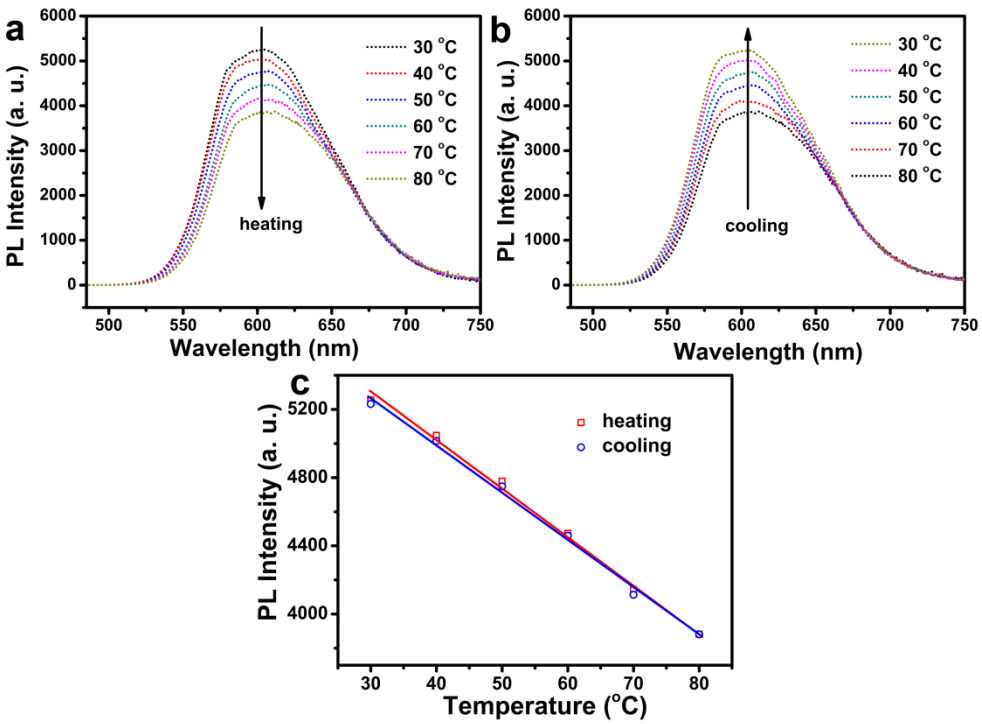

Figure S9 Temperature-dependent PL spectra of AISe/ZnS (Ag/In = 1/12) core/shell QDs in a heating (a)-cooling (b) cycle; (c) PL intensity shifts of AISe/ZnS core/shell QDs over temperature.

Table S1 EDS results of three batches of AISe (Ag/In=1/12) core and AISe/ZnS core/shell QDs synthesized in the same electric pressure cooker.

Sample	cores Ag/In/Se	core/shell Ag/In/Zn/Se/S
1	**1/10.8/12.1**	**1/6.13/7.15/7.71/7.45**
2	**1/10.1/12.8**	**1/6.04/6.87/7.54/7.26**
3	**1/9.95/11.9**	**1/6.09/6.99/7.35/7.32**

Table S2 Double-exponential fitting results for PL decay profiles of CISe/ZnS and AISe/ZnS core/shell QDs with different precursor ratios.

Sample	τ_1(ns)	A_1/%	τ_2(ns)	A_2/%	Lifetime(ns)
CISe/ZnS (1:20)	**37.2**	**52.5**	**210.2**	**43.5**	**114.6**
CISe/ZnS (1:12)	**25.6**	**46.1**	**193.8**	**52.6**	**128.9**
CISe/ZnS (1:8)	**32.4**	**41.7**	**200.8**	**57.3**	**144.3**
CISe/ZnS (1:4)	**21.7**	**51.2**	**152.1**	**45.3**	**94.7**
CISe/ZnS (1:2)	**20.7**	**51.0**	**148.3**	**50.1**	**93.4**
AISe/ZnS (1:20)	**20.0**	**69.7**	**138.6**	**30.5**	**55.5**
AISe/ZnS (1:12)	**24.8**	**55.7**	**166.9**	**43.5**	**111.6**
AISe/ZnS (1:8)	**28.4**	**54.6**	**183.9**	**42.2**	**111.3**
AISe/ZnS (1:4)	**40.8**	**48.0**	**231.7**	**49.3**	**148.2**
AISe/ZnS (1:2)	**20.6**	**50.9**	**148.3**	**50.0**	**93.4**

Table S3 EDS results of CISe core, CISe/ZnS core/shell, AISe core and AISe/ZnS core/shell QDs.

Cu/In ratios of starting materials	cores Cu/In/Se	core/shell Cu/In/Zn/Se/S	Ag/In ratios of starting materials	cores Ag/In/Se	core/shell Ag/In/Zn/Se/S
1:20	1/15.6/17.5	1/10.8/12.1/14.5/12.9	1:20	1/15.4/15.7	1/10.1/12.6/16.2/11.8
1:12	1/10.9//13.5	1/5.67/7.68/7.24/7.71	1:12	1/10.1/12.8	1/6.04/6.87/7.54/7.26
1:8	1/7.10/9.05	1/3.08/5.55/4.68/4.03	1:8	1/5.82/7.21	1/4.14/5.04/5.87/5.48
1:4	1/3.62/5.34	1/1.67/2.39/2.89/2.27	1:4	1/3.17/5.10	1/2.09/2.78/3.42/2.92
1:2	1/1.95/3.61	1/1.20/1.81/2.41/1.65	1:2	1/1.50/3.12	1/1.12/2.36/2.51/2.62