

Shape-Controlled Synthesis of PbS Nanocrystals via a Simple One-Step Process

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Table S1. Observed interlayer spacing (kd , nm) from the pronounced ($0k0$) reflections of the as-obtained lead thiolate compound.

| θ (°) | d (nm) | k | kd (nm) |
|--------------|----------|-----|-----------|
| 2.302 | 1.918 | 2 | 3.836 |
| 3.489 | 1.266 | 3 | 3.798 |
| 4.665 | 0.947 | 4 | 3.788 |
| 5.846 | 0.756 | 5 | 3.780 |
| 7.072 | 0.626 | 6 | 3.756 |
| 8.263 | 0.536 | 7 | 3.752 |
| 9.444 | 0.469 | 8 | 3.752 |
| 10.685 | 0.415 | 9 | 3.735 |
| 11.918 | 0.373 | 10 | 3.730 |
| 13.134 | 0.339 | 11 | 3.729 |
| 14.335 | 0.311 | 12 | 3.732 |
| 15.576 | 0.287 | 13 | 3.731 |
| 16.813 | 0.266 | 14 | 3.724 |
| 18.055 | 0.248 | 15 | 3.720 |
| 19.292 | 0.233 | 16 | 3.728 |
| 20.563 | 0.219 | 17 | 3.723 |
| 21.866 | 0.207 | 18 | 3.726 |
| 23.117 | 0.196 | 19 | 3.724 |
| 24.421 | 0.186 | 20 | 3.720 |

Figure S1

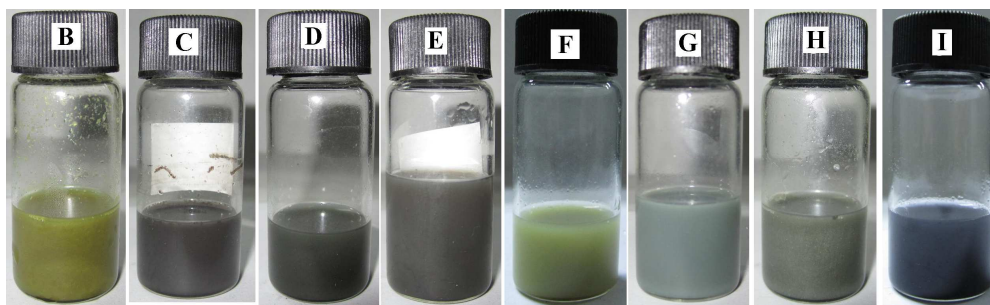


Figure S1. Digital photographs of PbS nanocrystals dispersed in chloroform, which were synthesized under different reaction conditions using different surfactants.

Figure S2.

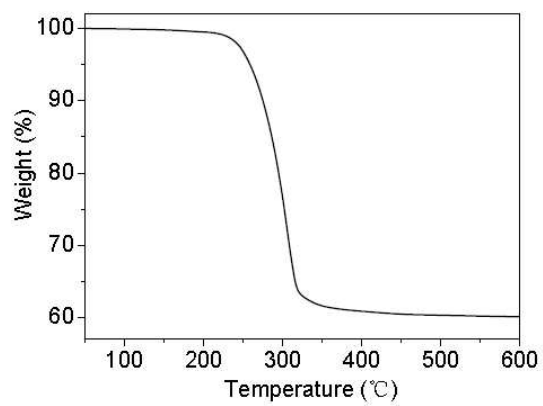


Figure S2. TGA curve of $\text{Pb}_m(\text{C}_{12}\text{H}_{25})_n$ compound.

Figure S3.

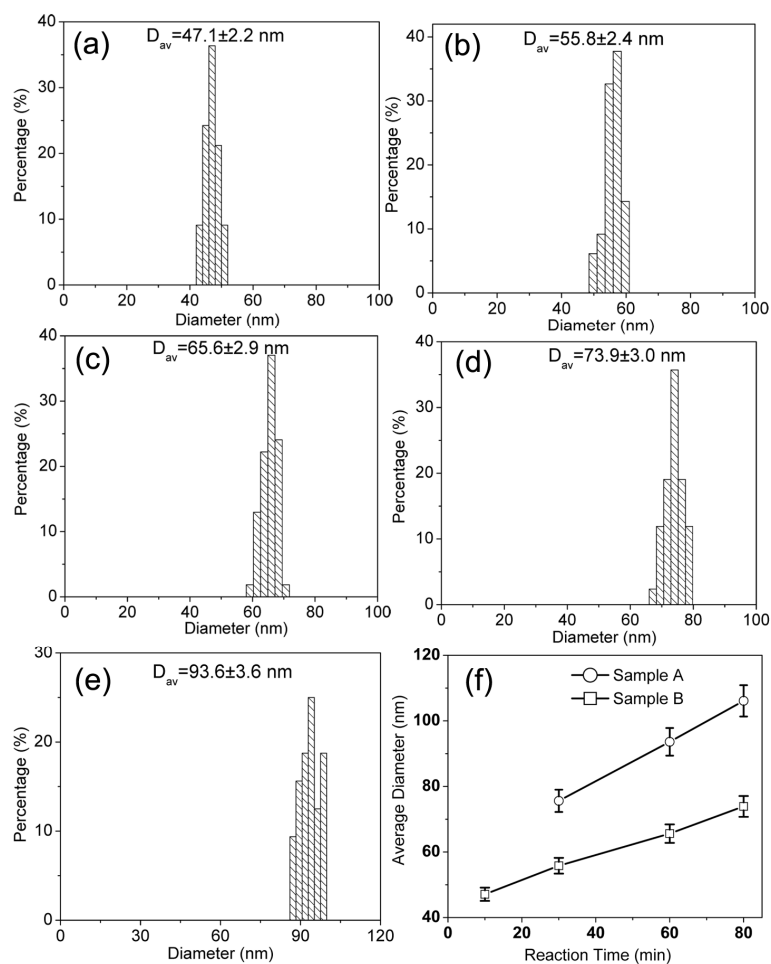


Figure S3. Size distribution histograms of octahedral PbS nanocrystals obtained at different reaction time and different amount of substance of Pb(OAc): (a) 10 min, Sample B; (b) 30 min, Sample B; (c) 60 min, Sample B; (d) 80 min, Sample B and (e) 60 min, Sample A and (f) the average diameter versus the reaction time of Sample A and Sample B.

Figure S4.

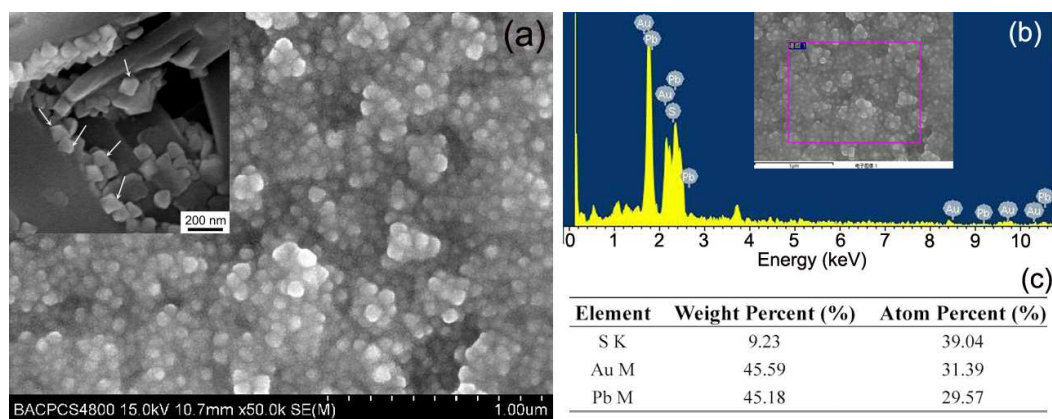


Figure S4. (a) SEM image of Sample B obtained at 60 min, inset shows an enlarged SEM image; (b) the corresponding EDS pattern of Sample B and (c) the element analysis of Sample B obtained from the EDS result.

Figure S5.

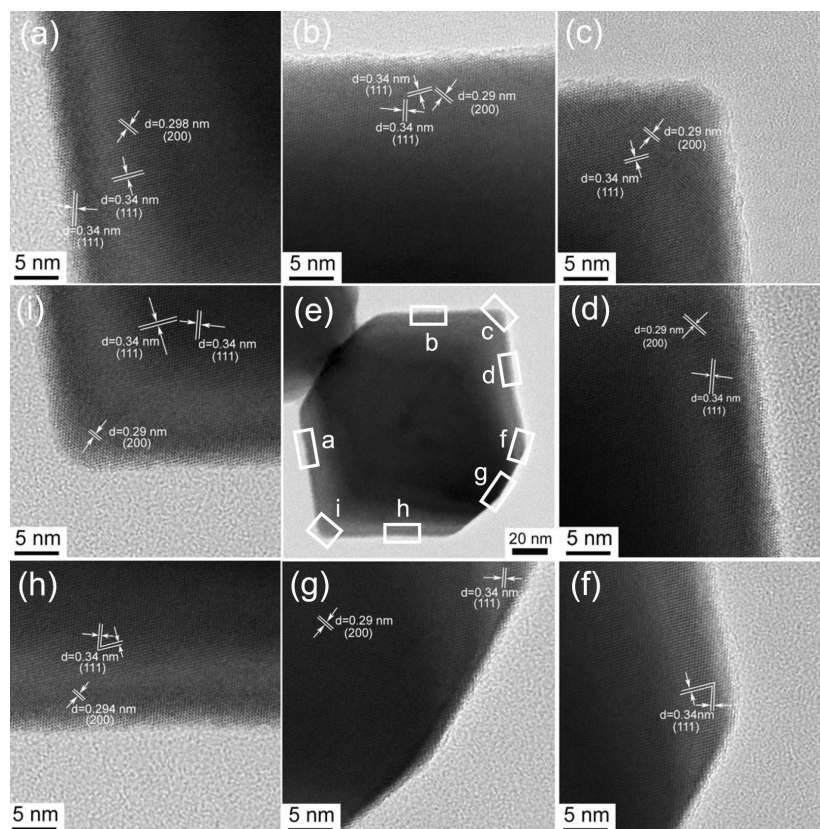


Figure S5. (a-d) and (f-i) are the HRTEM image of the different parts of Sample A shown in (e).

Figure S6.

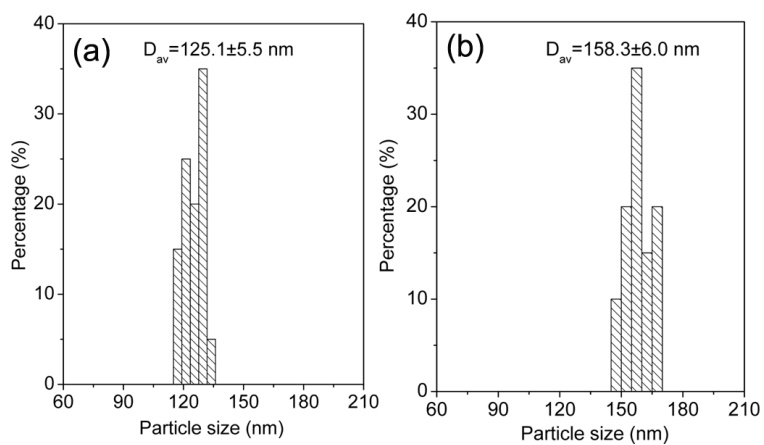
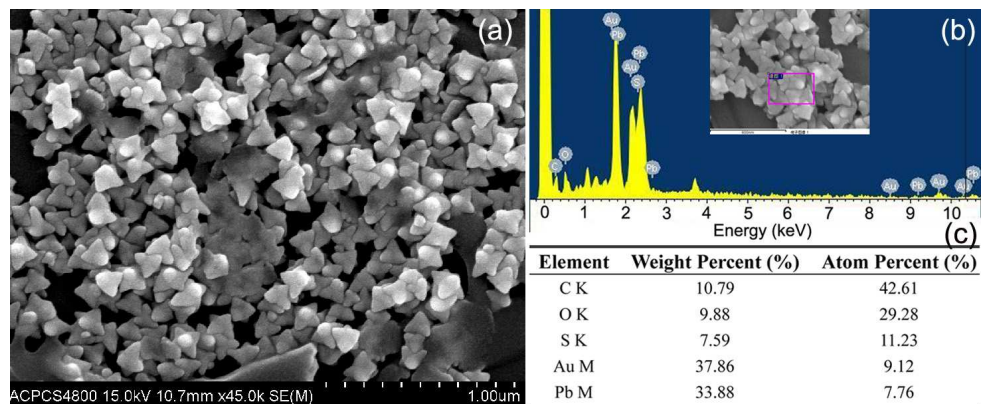


Figure S6. Size distribution histograms of Sample D obtained at different reaction time: (a) 10 min; (b) 60 min.

Figure S7.



FigureS7. (a) Low-magnification SEM image of Sample D and (b) the corresponding EDS, (c) element analysis of Sample D obtained from the EDS result.

Figure S8.

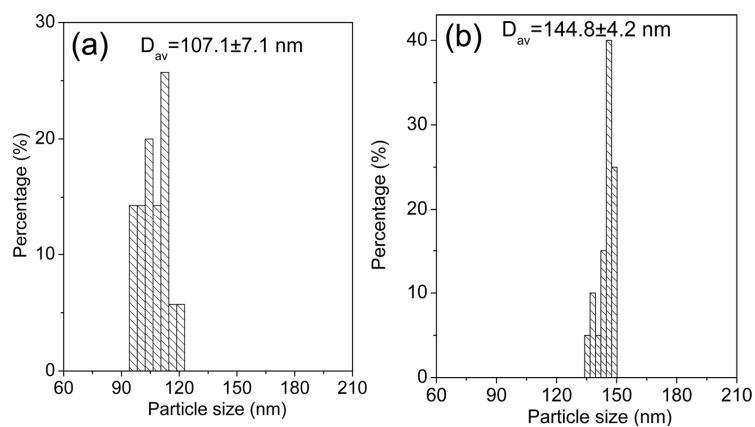


Figure S8. Size distribution histograms of (a) Sample E and (b) Sample D obtained at 30 min.

Figure S9.

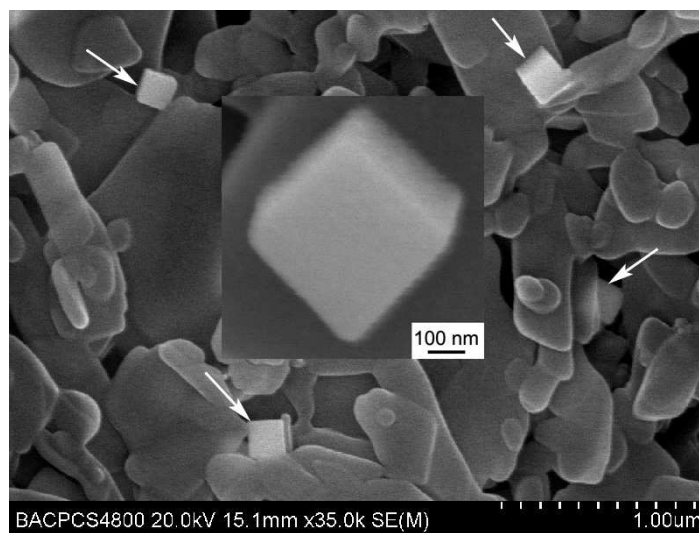


Figure S9. A typical SEM image of cubic PbS nanocrystals, and the inset shows a magnified SEM image.