Supporting information:

**Manipulation of Semiconductor Nanocrystal Growth in Polymer Soft Solid**

Hao Zhang, Yue Tang, Junhu Zhang, Minjie Li, Xi Yao, Xiao Li, and Bai Yang [*]

State Key Laboratory of Supramolecular Structure and Materials, College of Chemistry, Jilin University, Changchun 130012, P. R. China

E-mail: byangchem@jlu.edu.cn

Figure S1 Temporal evolution of the PL emission peak positions of the CdTe-PS composite films and the corresponding chloroform solutions of redissolved films. The growth temperature was 140, 170 and 200 °C, respectively.
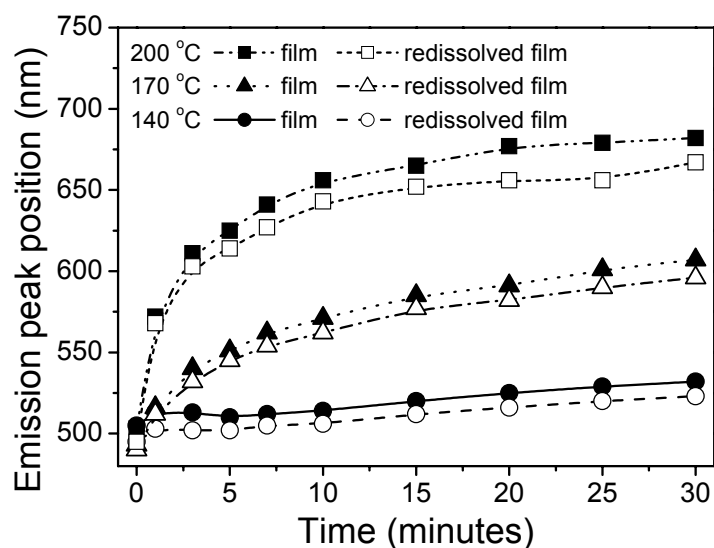
Figure S2 Data and error bars of the temporal evolution of the emission peak position of CdTe-PS films at 140, 160, 170, 180 and 200 °C. Corresponding figures are indicated in Figure 1d.

Time (min)	200 °C (nm)	180 °C (nm)	170 °C (nm)	160 °C (nm)	140 °C (nm)
0	503	508	493	504	505
1	572±0	535±1	516±3	511±2	513±4
3	611±3	565±5	540±10	524±3	513±0
5	625±5	580±0	551±11	532±2	510±6
7	641±2	592±4	562±7	539±1	512±8
10	656±4	607±3	571±2	548±1	514±7
15	665±2	618±7	585±4	561±6	520±6
20	677±3	635±7	591±2	564±2	525±4
25	679±6	645±13	601±6	574±5	529±5
30	682±1	656±8	607±3	578±0	532±3

Figure S3 Comparison of the real size distribution of NCs and Smoluchowski model. According to the Smoluchowski equation which describes the collision of particles in polydisperse system, the relative contributions of coalescence and condensation are represented by the dimensionless group C, which is expressed as:

$$\frac{C}{1+\mu_1\mu_3} = \frac{B(S-1)(\upsilon^+)^{-1}}{\frac{2kT}{3\mu}(1+\mu_1\mu_3)N}$$

where B is the proportionality coefficient in the equation for the condensation rate, S is the supersaturation, υ^+ is a mean particle volume, k is the Boltzmann's constant, μ and T are the viscosity and temperature of the medium, and N is the total number concentration of particles. μ_1 and μ_3 are defined as:

$$\mu_1 = \frac{r_3}{r_H} \quad \text{and} \quad \mu_3 = \frac{r_1}{r_3}$$

where r_3 is the cube mean radius, r_H is the harmonic mean radius, and r_1 is the arithmetic mean radius. For each value of C, there exist the unique μ_1 and μ_3. If $1<\mu_1<1.25$ and $1>\mu_3>0.905$, the growth is through the coalescence and condensation of particles. On the basis of our experimental results in the following Table, we come to the conclusion that the procedure of NC growth in polymer host is dynamic coalescence.

| Time (min)	r_1 (nm)	r_3 (nm)	r_h (nm)	μ_1	μ_3
1	1.1315	1.2035	0.9655	1.060	0.956
3	1.4855	1.6375	1.4595	1.122	0.907
7	1.6255	1.6965	1.6345	1.038	0.958
20	1.7950	1.8965	1.7950	1.056	0.946

References:

1. J. Pich, S. K. Friedlander and F. S. Lai, *J. Aerosol Sci.*, 1970, **1**, 115-126.

2. L. Meli and P. F. Green, *Acs Nano*, 2008, **2**, 1305-1312.

Figure S4 Differential scanning calorimetry (DSC) measurement of the *Tg* of PS, PMMA, PVP, AFPS, and the corresponding NC-polymer composites. DSC analysis was performed on a NETZSCH DSC204 thermal analyzer in a nitrogen atmosphere at a heating rate of 10 K min^{-1}.

Polymers	Theoretical *Tg* (°C)	Measured *Tg* (°C)
PS (Mn of 9,000)	81.1	91.0
PS (Mn of 90,000)	98.1	98.0
PS (Mn of 280,000)	99.4	102.2
PMMA	125.0	124.6
PVP	175.0	177.4
AFPS		78.0

NC-Polymer Composites	Measured *Tg* (°C)
NC-PS (Mn of 90,000)	111.2
NC-PMMA	121.5
NC-PVP	175.5
NC-AFPS	147.0

Figure S5 Temporal evolution of the PL emission peak positions of the CdTe-PVA composite films at 240 °C. The corresponding temporal evolution of the PL emission peak positions of CdTe-PS, CdTe-PMMA, and CdTe-PVP films at 240 °C were indicated in Figure 3c, e, and g.
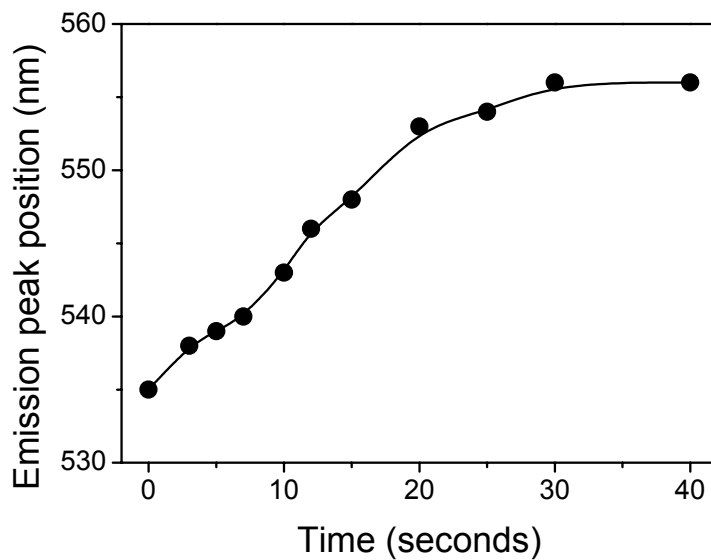
Figure S6 Comparison of the temporal evolution of the emission peak of CdTe NCs in PS (solid circle) and in polycarbonate (open circle) at 240 °C.