

Electronic Supplementary Information

Regulating the Size and Molecular Weight of Polymeric Particles by 1,1-Diphenylethene Controlled Soap-Free Emulsion Polymerization

Xinlong Fan, Yin Liu, Xiangkun Jia, Shenqiang Wang, Chunmei Li, Baoliang Zhang, Hepeng Zhang, Qiuyu Zhang

Department of Applied Chemistry, School of Science, Northwestern Polytechnical University, No. 127, West Youyi Road, Xi'an 710072, Shaanxi, China

Table S1 Detailed experimental conditions for the preparation of PS.

Sample	S (g)	DPE (g)	KPS (g)	Water (mL)
1	0.5	0.03	0.05	100
2	1.0	0.03	0.05	100
3	3.0	0.03	0.05	100
4	5.0	0.03	0.05	100
5	7.0	0.03	0.05	100
6	3.0	0.05	0.08	100
7	3.0	0.07	0.12	100
8	3.0	0.09	0.15	100
9	0.5	/	0.05	100
10	1.0	/	0.05	100
11	3.0	/	0.05	100
12	5.0	/	0.05	100
13	7.0	/	0.05	100
14	3.0	/	0.08	100
15	3.0	/	0.12	100
16	3.0	/	0.15	100

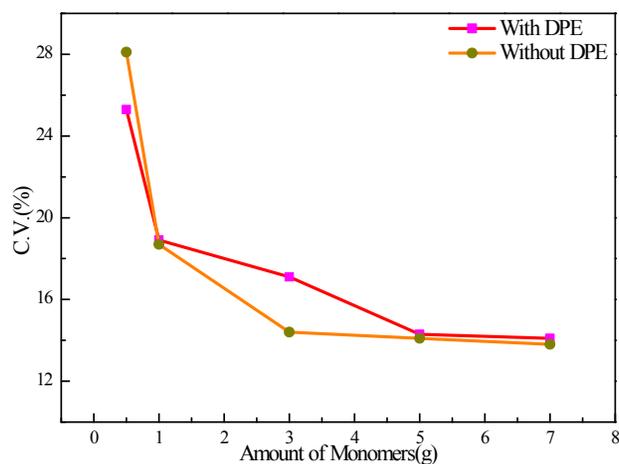


Figure S1. Coefficient of variation (C.V.) of PS particles produced with different amounts of monomer.

The C.V. was calculated by the following formula:

$$C.V. = \frac{\sigma}{\frac{\sum_i n_i d_i}{\sum_i n_i}} \times 100\% \quad (1)$$

$$\text{Where, } \sigma = \left\{ \frac{\sum_i \left[d_i - \left(\frac{\sum_i n_i d_i}{\sum_i n_i} \right) \right]^2}{\sum_i n_i} \right\}^{\frac{1}{2}} \quad (2)$$

Where d_i is the diameter of the determined particle and n_i is the number of particles whose diameter is d_i .

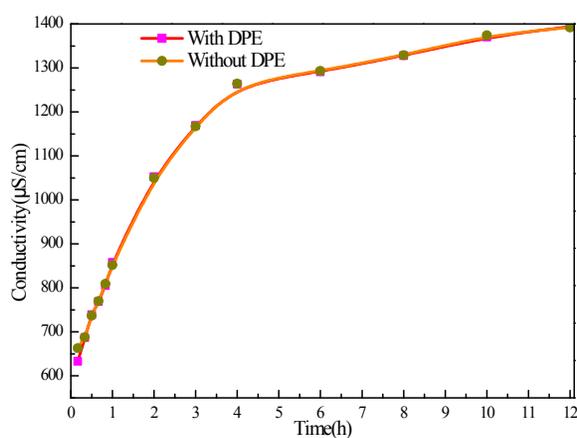


Figure S2. The conductivities of the soap-free emulsion in the presence and absence of DPE measured at different polymerization times.

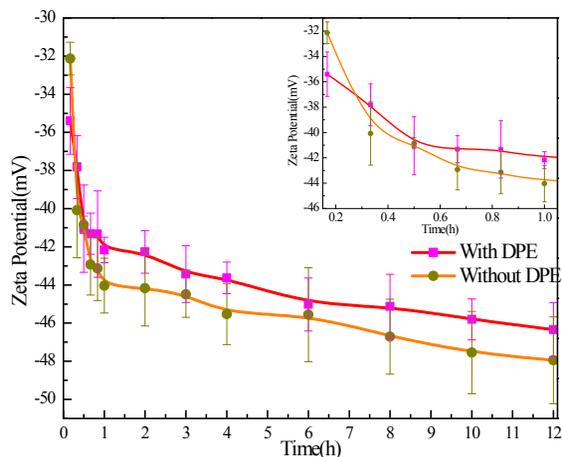


Figure S3. The zeta potentials of PS colloidal suspensions after dialysis to remove free movable ions.

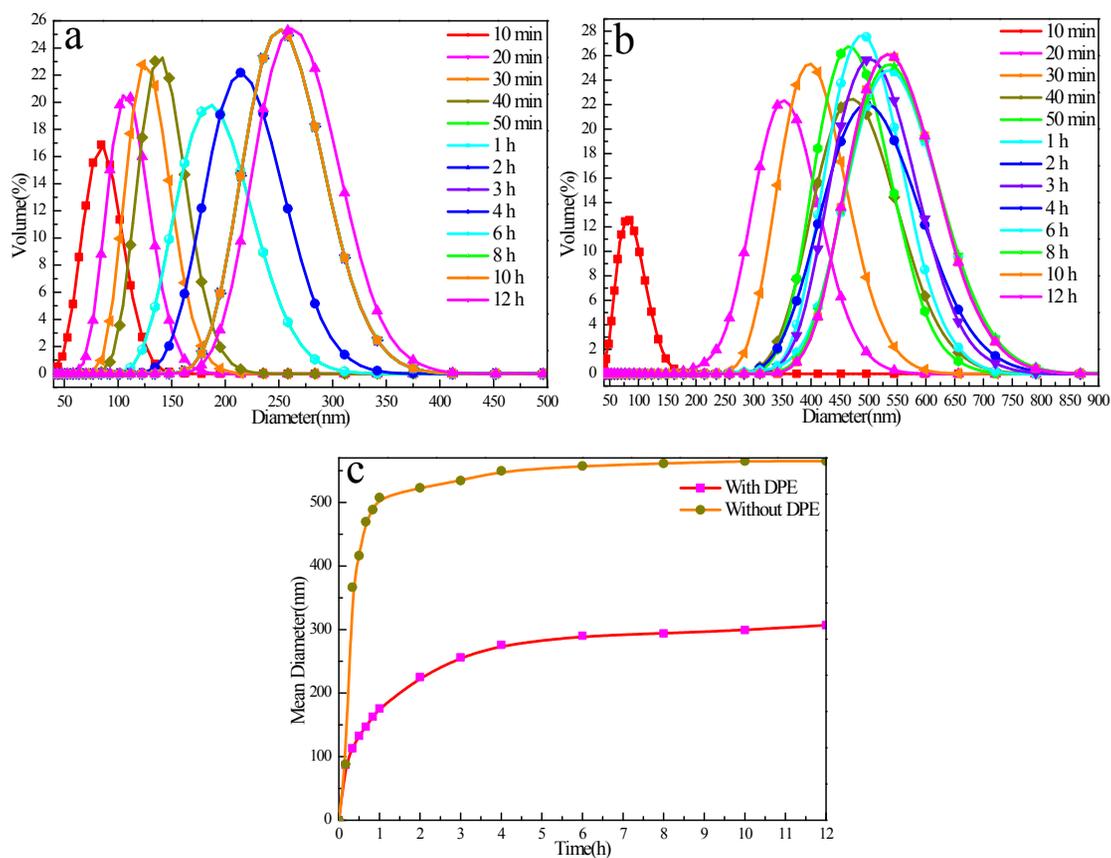


Figure S4. The size distributions of PS particles in the presence (a) and absence (b) of DPE at different polymerization time, the variation of mean diameter (c) of particles in the presence and absence of DPE.

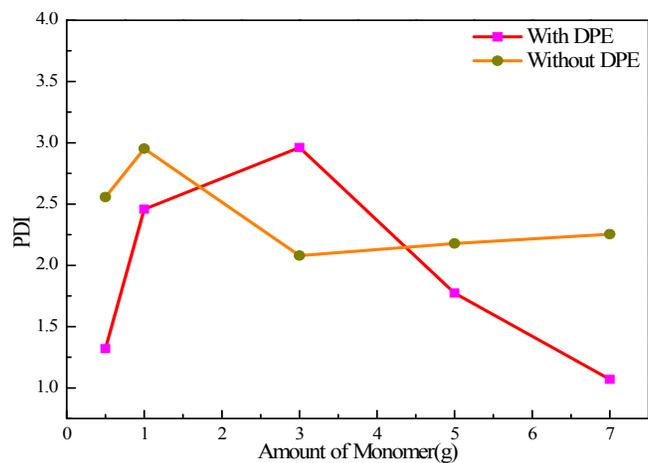


Figure S5. The PDIs of PS produced with different amounts of monomer.

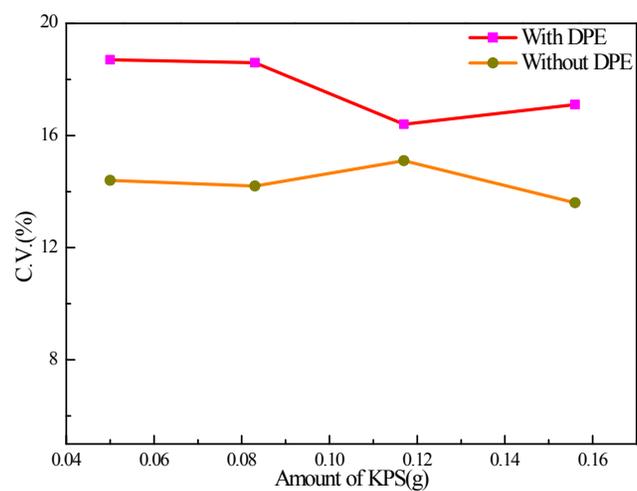


Figure S6. C.V. of PS particles produced with different amounts of KPS.

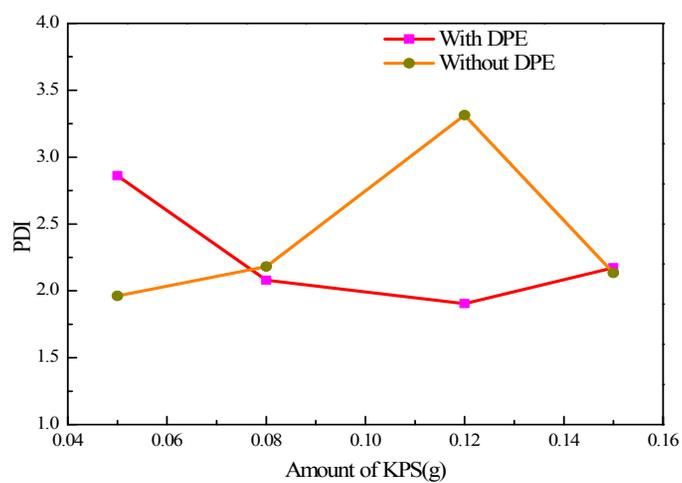


Figure S7. The PDIs of PS produced with different amounts of KPS.