Supporting Information

One-Step Preparation of Silica Microspheres with Super-stable Ultralong Room Temperature Phosphorescence

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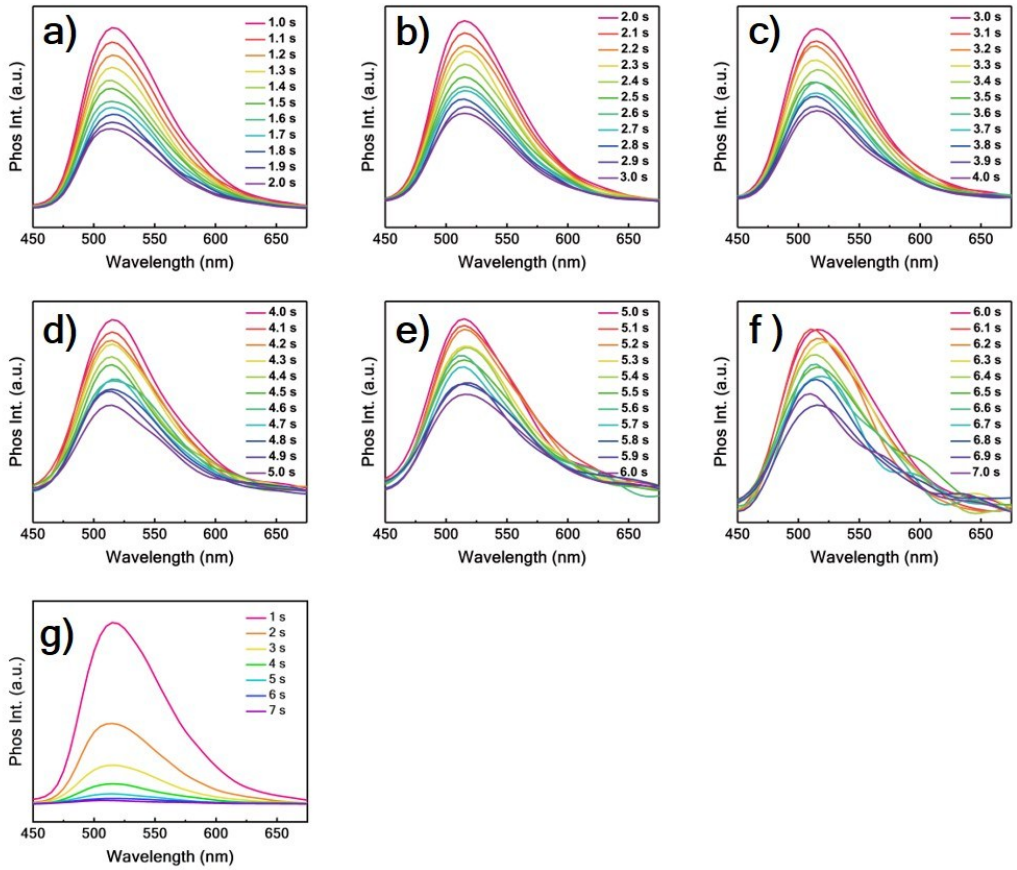


Figure S1. Time-resolved PL spectra of CPDs/SiO_2 (1.0 s-7.0 s).

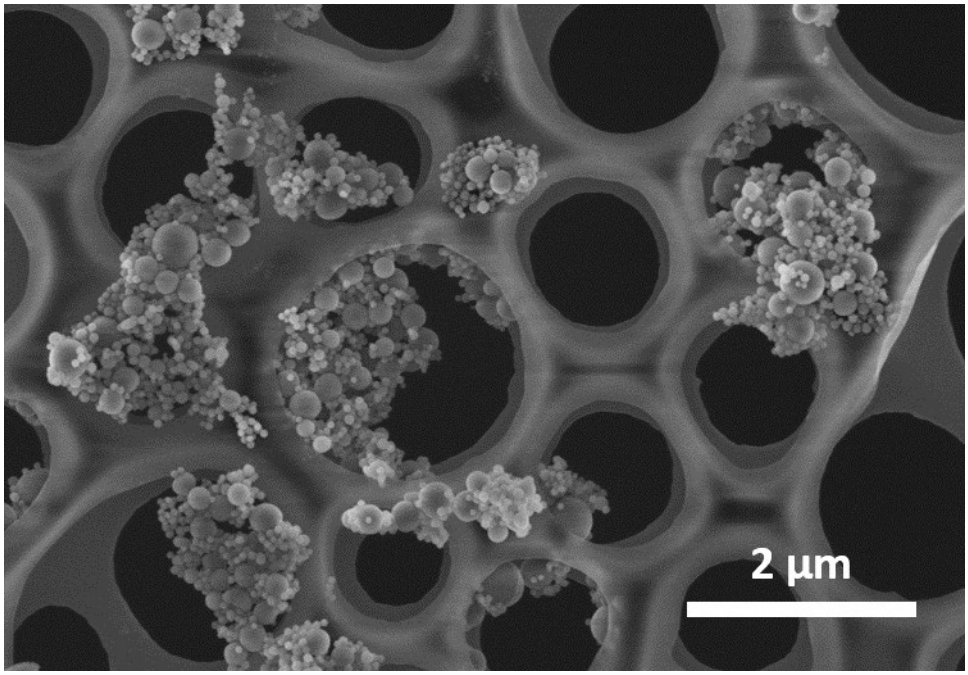


Figure S2. SEM image of CPDs/SiO_2 Ms on a lacey support film as grids.

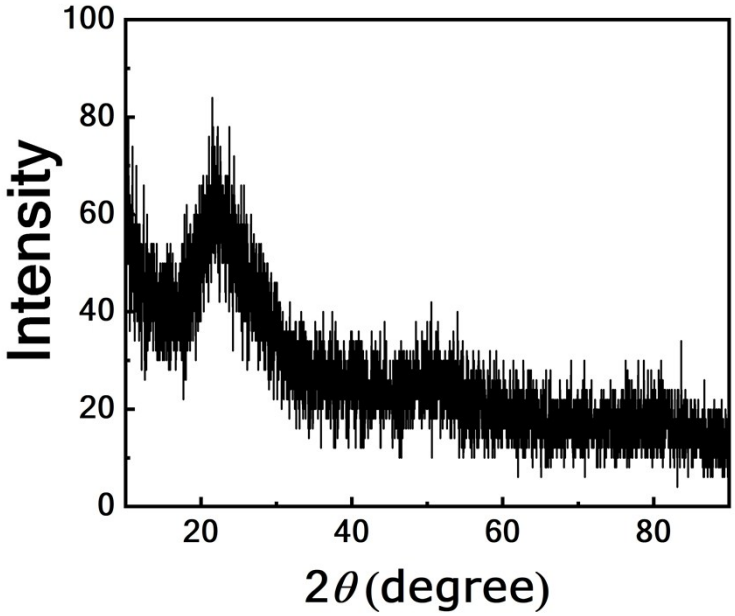


Figure S3. XRD patterns of CPDs/SiO_2 Ms.

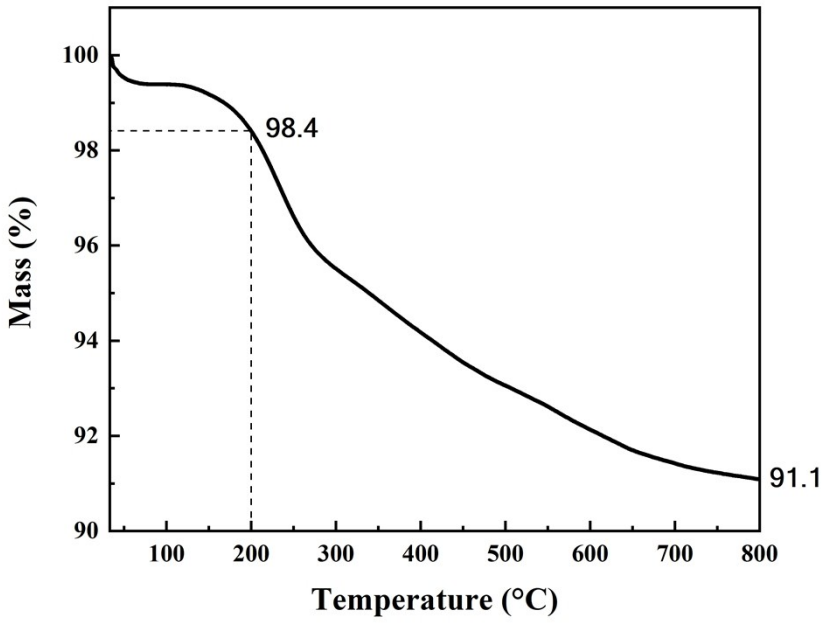


Figure S4. Thermal gravimetric (TG) curve of CPDs/SiO_2 Ms.

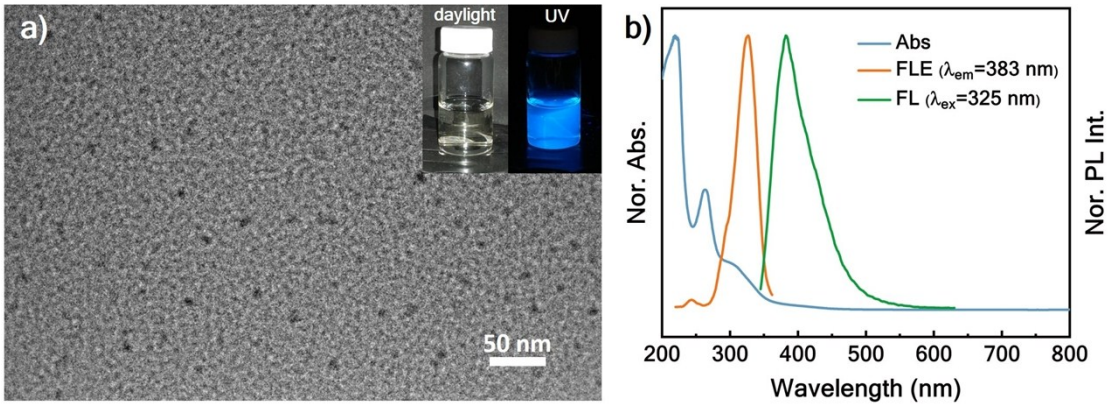


Figure S5. a) TEM image of EDA-CPDs. The insets were optical images of EDA-CPDs water solution under daylight and 365 nm UV light, respectively. b) The UV/Vis absorbance (blue line), FL excitation (orange line) and emission (green line) spectra of the EDA-CPDs water solution.

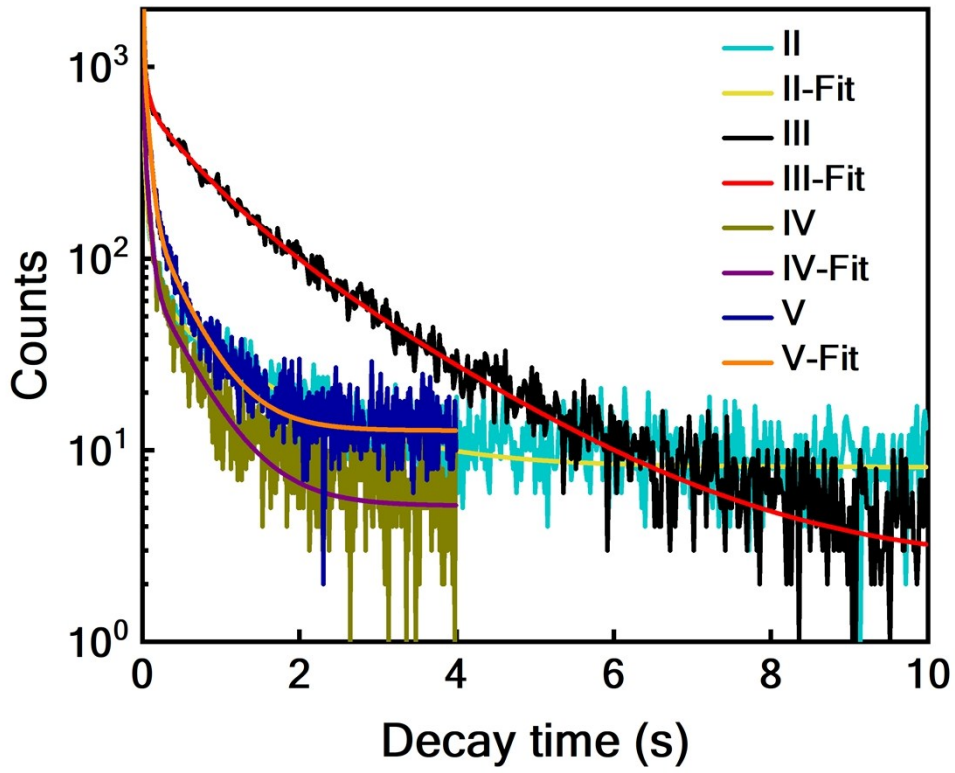


Figure S6. The PL decay spectra of sample Ⅱ-Ⅴ.

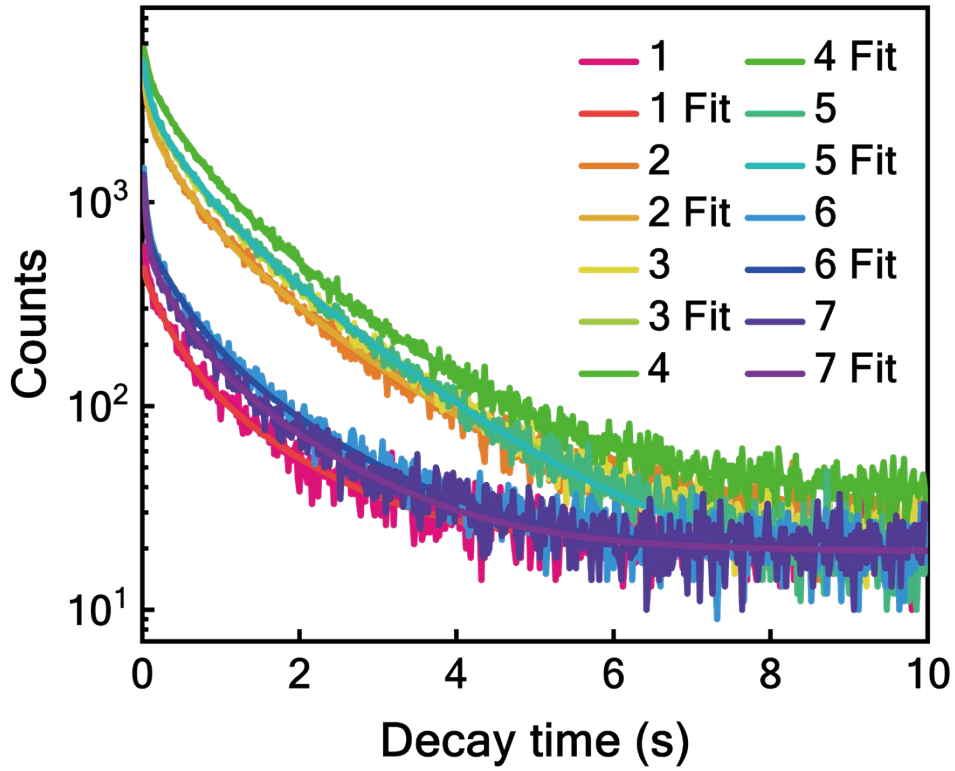


Figure S7. The PL decay spectra and fitting curves of sample 1-7.

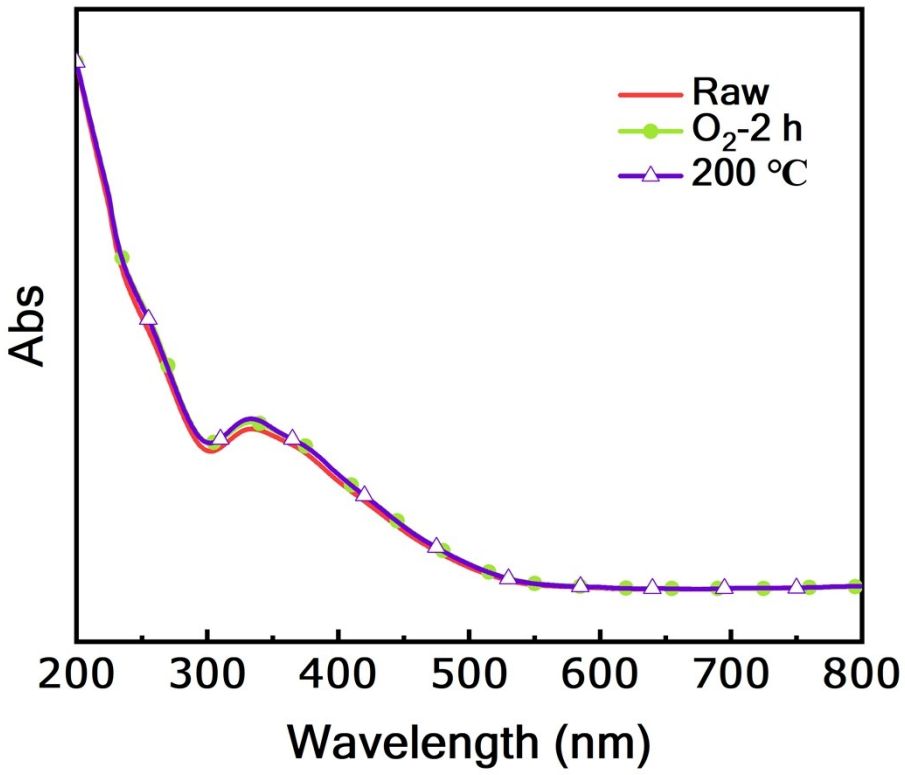


Figure S8. The UV/Vis absorbance spectra of the CPDs/SiO_2 Ms under ambient condition (red solid line, named Raw), after 2h oxygen treatment (green dots line, named O_2-2 h) and after heat treatment at 200 ℃ for 10 minutes and continuous cooling to room temperature (purple triangle line, named 200 ℃).

Table S1. RTP lifetime of samples synthesized by TEOS and EDA analogues.

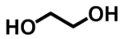
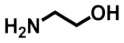
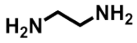
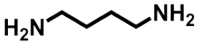
Sample	Structural Formula	RTP Lifetime
Ⅰ		**No RTP**
Ⅱ		**0.78 s**
Ⅲ		**1.26 s**
Ⅳ		**0.20 s**
Ⅴ		**0.14 s**

Table S2. Lifetime fitting paraments of sample Ⅱ-Ⅴ.

Sample	τ_1 (s)	τ_2 (s)	τ_3 (s)	p_1(%)	p_2(%)	p_3(%)	χ2	τ_{avg}(s)
Ⅱ	0.02	0.11	1.16	15.12	19.79	65.09	1.393	0.78
Ⅲ	0.06	0.63	1.68	4.32	33.21	62.47	1.204	1.26
Ⅳ	0.006	0.05	0.51	38.33	26.35	35.32	1.565	0.20
Ⅴ	0.007	0.06	0.40	37.1	31.36	31.53	1.460	0.16

Table S3. List of the raw materials and RTP lifetime of our RTP materials which were prepared with different molar ratio of TEOS: EDA.

Sample	**1**	**2**	**3**	**4**	**5**	**6**	**7**
H_2O / mL	30	30	30	10	10	10	10
TEOS / mmol	30	30	30	10	10	10	10
EDA / mmol	3	6	15	10	20	50	100
Molar ratio TEOS: EDA	**10:1**	**5:1**	**2:1**	**1:1**	**1:2**	**1:5**	**1:10**
RTP lifetime / s	**0.96**	**1.08**	**1.11**	**1.20**	**1.13**	**1.02**	**0.95**