

Supporting Information

Ultrastable and high colour rendering index WLEDs based on two-step facile encapsulate CsPbBr₂ nanocrystals

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Table S1. The FWHM and PLQY values of CsPbBr₂@zeolite and PMMA samples.

sample	CsPbBr ₂ @zeolite			CsPbBr ₂ @zeolite/PMMA				
	130 °C	150 °C	170 °C	PMMA-3	PMMA-6	PMMA-9	PMMA-12	PMMA-15
FWHM (nm)	36.4	40.5	37.8	38.4	32.9	34.1	34	34.6
PLQY	45	54.2	52	28	36	42	50.5	53.9

Table S2. The emission wavelength and FWHM data of the CsPbBr₂@zeolite and PMMA-15 samples were compared after 30 days in air.

Sample	Emission Wavelength (nm)		FWHM (nm)	
	Former	After 30 days	Former	After 30 days
CsPbBr ₂ @zeolite	647	645	40.5	43.18
PMMA-15	641	641	34.6	34.6

Table S3. Testing correlated color temperature (CCT), Theoretical CCT, Color rendering index (CRI), CIE Coordinates (x, y) based of R-PMMA-15 WLEDs under different forward current.

Current	Testing CCT (K)	Theoretical CCT (K)	CRI	CIE (x, y)
10 mA	5354	5352	94.5	(0.3359, 0.3455)
20 mA	5856	5855	94.1	(0.3324, 0.3434)
40 mA	6473	6473	90.4	(0.3115, 0.3425)
60 mA	6967	6976	86.9	(0.3022, 0.3399)
80 mA	7418	7431	81.9	(0.2950, 0.3356)
100 mA	7623	7637	79.2	(0.2922, 0.3329)
120 mA	7677	7686	78.3	(0.2912, 0.3336)

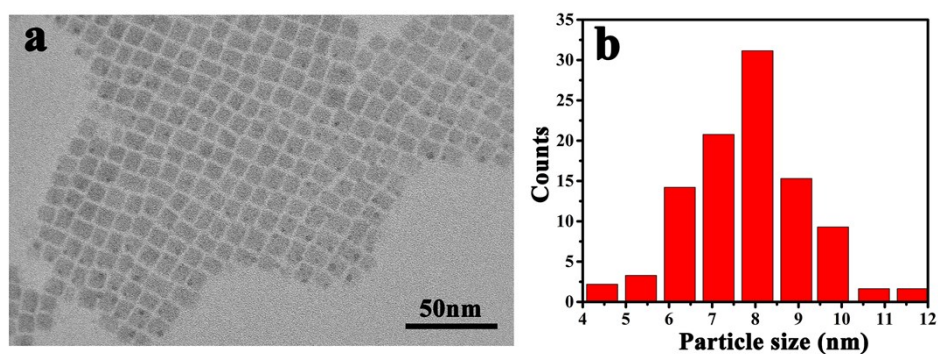


Figure S1. a) The TEM image of CsPbBr₂-150 °C solution. b) The particle size distribution histograms of the CsPbBr₂-150 °C solution.

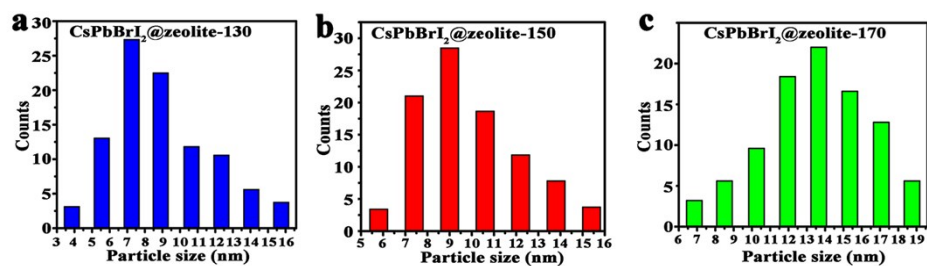


Figure S2. The corresponding particle size distribution histograms of the CsPbBr₂@zeolite powder at different heat treatment temperatures e) 130 °C, f) 150 °C and g) 170 °C, respectively.

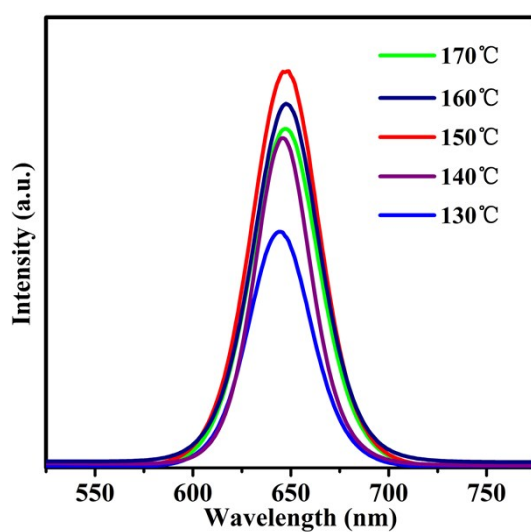


Figure S3. The emission spectra of the prepared CsPbBr₂@zeolite under different reaction temperature.

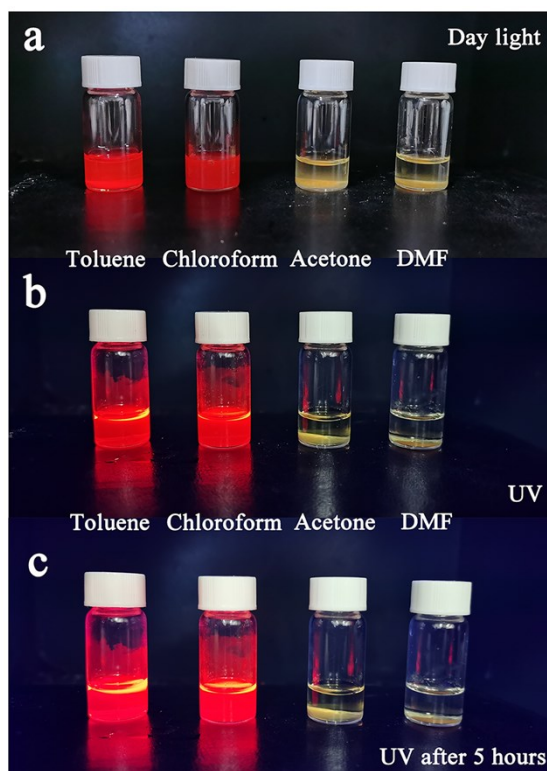


Figure S4. The photographs for solvent stability of CsPbBr₂@zeolite + toluene, chloroform, acetone, DMF (dimethylformamide), left to right. a) Day light. b) UV light. c) UV light after 5 hours.

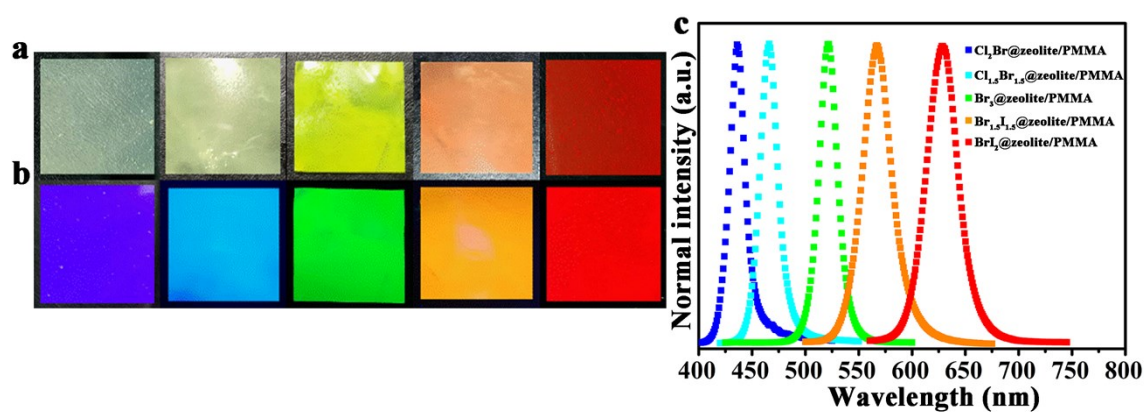


Figure S5. a, b) The photographs and c) normal PL spectra of Cl₂Br@zeolite/PMMA, Cl_{1.5}Br_{1.5}@zeolite/PMMA, Br₃@zeolite/PMMA, Br_{1.5}I_{1.5}@zeolite/PMMA, BrI₂@zeolite/PMMA, from left to right. a) Day light. b) UV light.

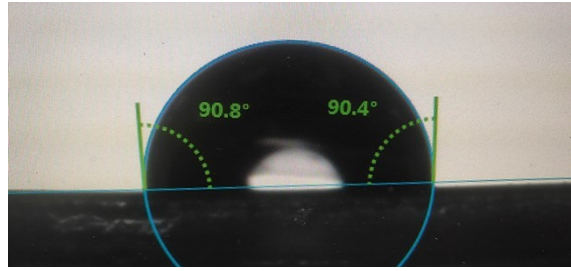


Figure S6. Water contact-angle measurement of CsPbBr₂@zeolite/PMMA-15 film.

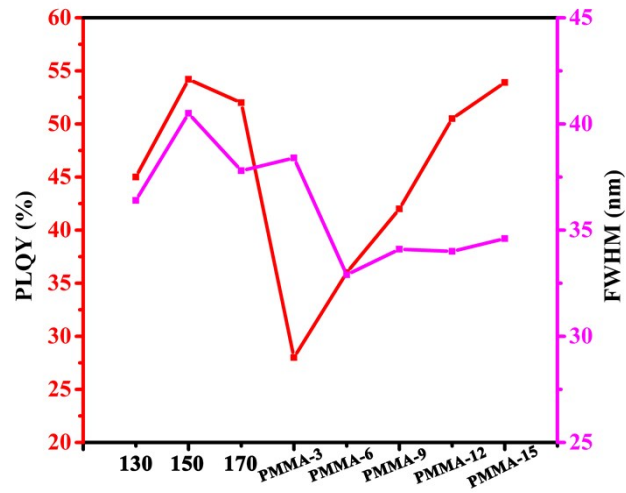


Figure S7. The changing curve of PLQY and FWHM value of CsPbBr₂@zeolite with different reaction temperature and CsPbBr₂@zeolite/PMMA.

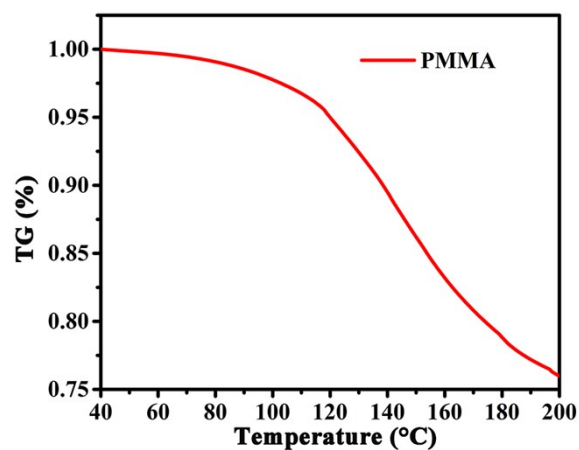


Figure S8. The TAG curve of PMMA polymer film.

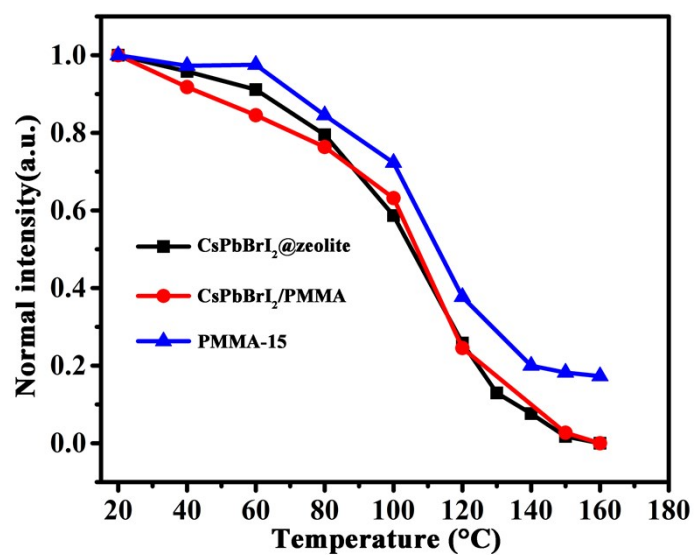


Figure S9. Temperature-dependent normal intensity of CsPbBr₂@zeolite (black) , CsPbBr₂/PMMA (red) and PMMA-15 (blue).

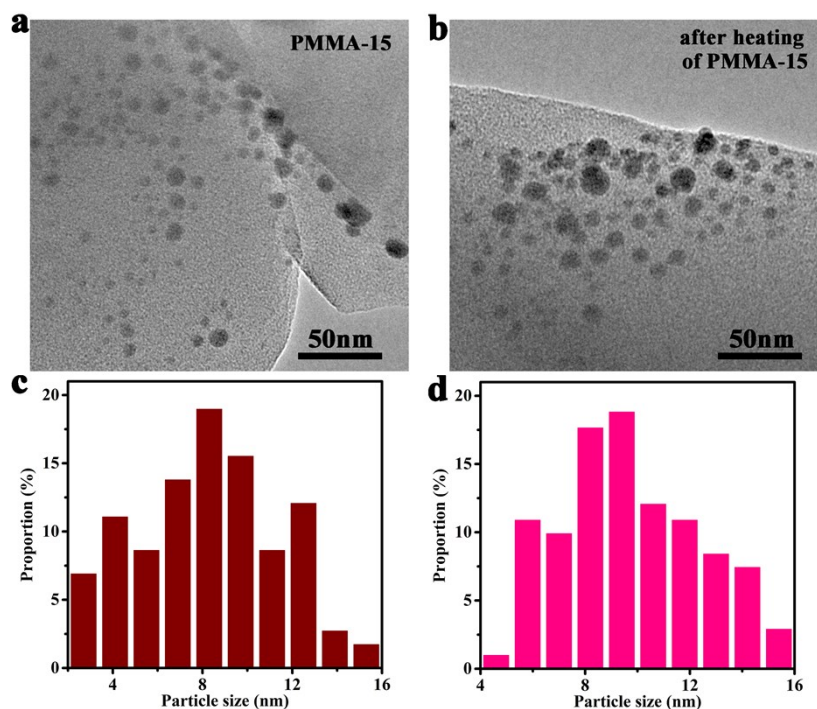


Figure S10. The TEM image of a) PMMA-15 and b) PMMA-15 after heating at 120°C. The particle size distribution histograms of c) PMMA-15 and d) PMMA-15 after heating at 120°C.

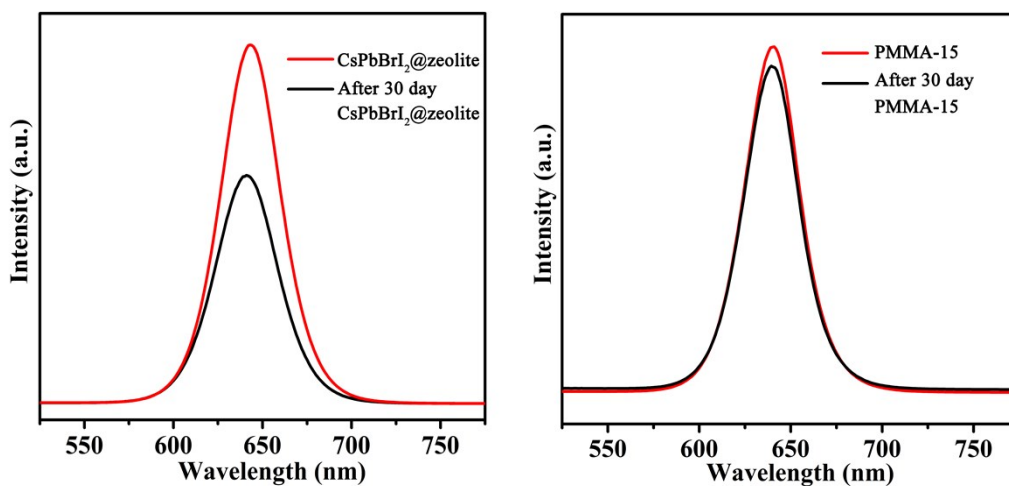


Figure S11. PL spectra of a) CsPbBr₂@zeolite and b) PMMA-15 after two months in air.

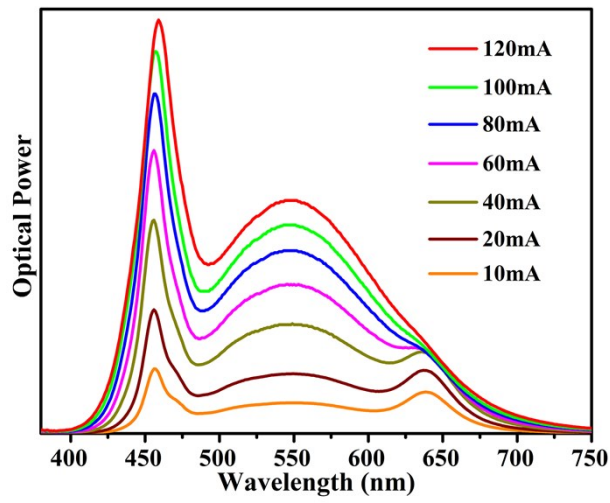


Figure S12. The corresponding spectral power distribution curves of different currents.