Supporting Information

Linear and Nonlinear Optical Characteristics of All-Inorganic Perovskite $CsPbBr_3$ Quantum Dots Modified by Hydrophobic Zeolite

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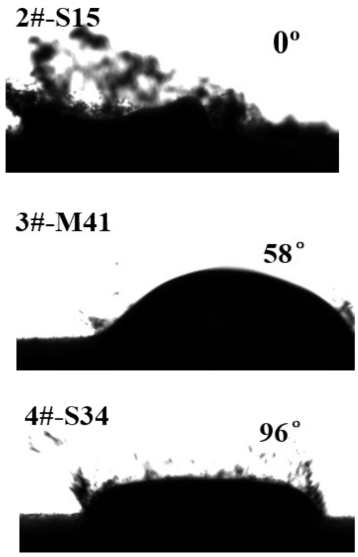

Figure S1. Shape of water droplet on the surface of different zeolites and the relevant water contact angles.

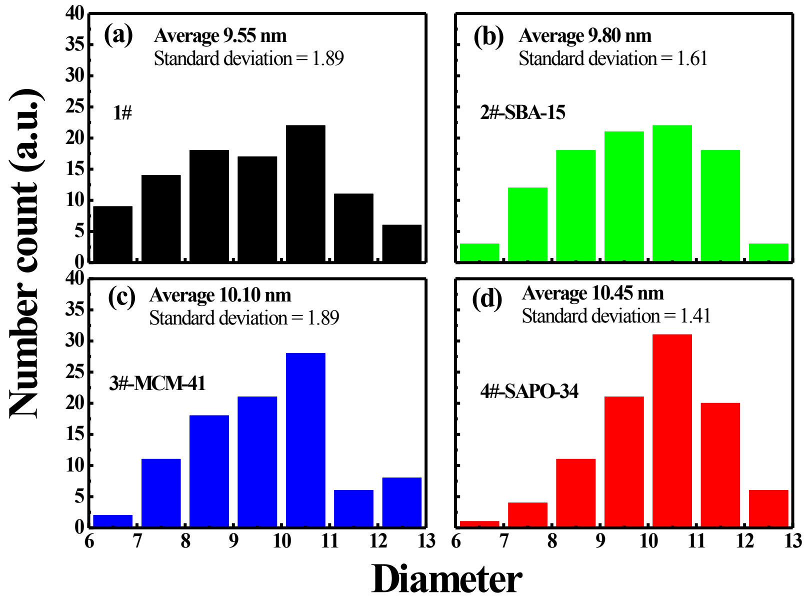

Figure S2. Histogram for the size distribution of the $CsPbBr_3$ QDs without and with zeolites.

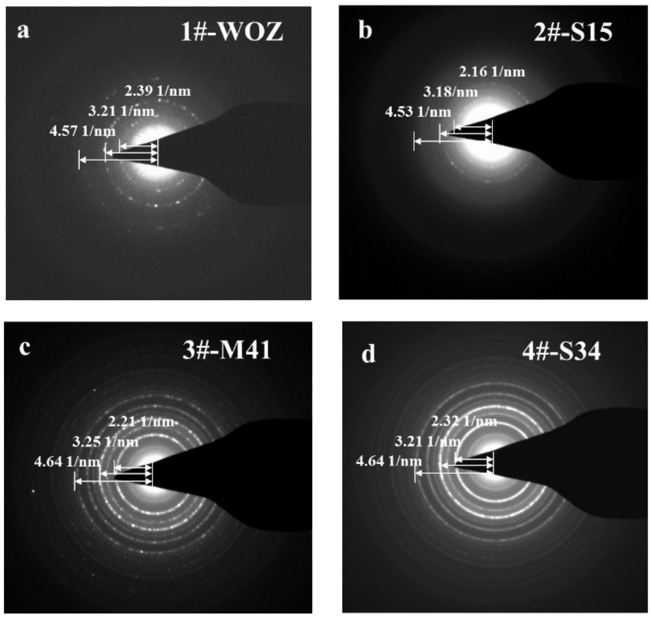

Figure S3. Selected area electron diffraction (SAED) patterns of 1#-WOZ, 2#-S15, 3#-M41, 4#-S34 samples.

Table S1. The ratio of the square of the distance of the diffraction ring to the center.

Sample	R [nm]	R^2	1/R [1/nm]	R_1^2: R_2^2: R_3^2
1#-WOZ	R_1=2.39	5.20	0.44	1:2:4
	R_2=3.21	10.30	0.31	
	R_3=4.57	20.89	0.28	
2#-S15	R_1=2.16	4.66	0.46	1:2:4
	R_2=3.18	10.11	0.31	
	R_3=4.53	20.52	0.22	
3#-M41	R_1=2.16	4.66	0.46	1:2:4
	R_2=3.18	10.11	0.31	
	R_3=4.53	20.52	0.22	
4#-S34	R_1=2.32	5.38	0.43	1:2:4
	R_2=3.21	10.30	0.31	
	R_3=4.64	21.53	0.22	

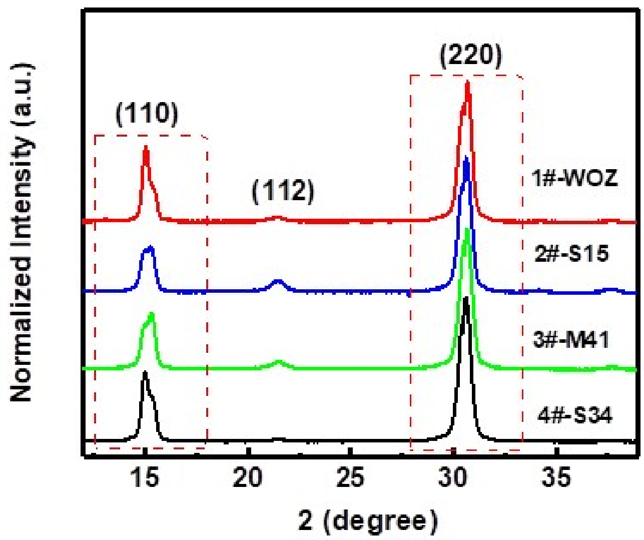

Figure S4. XRD patterns of the $CsPbBr_3$ QDs without and with zeolites.

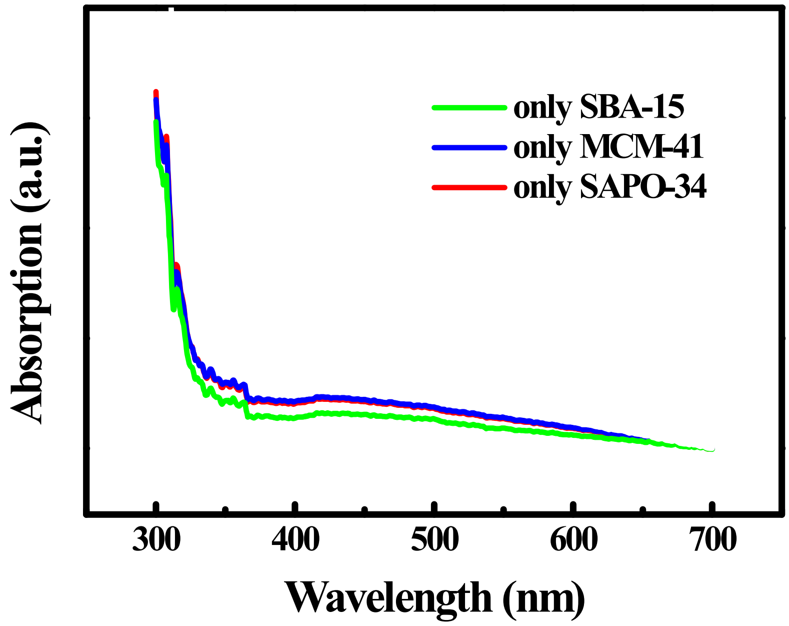

Figure S5. Optical absorption spectra of the zeolites.

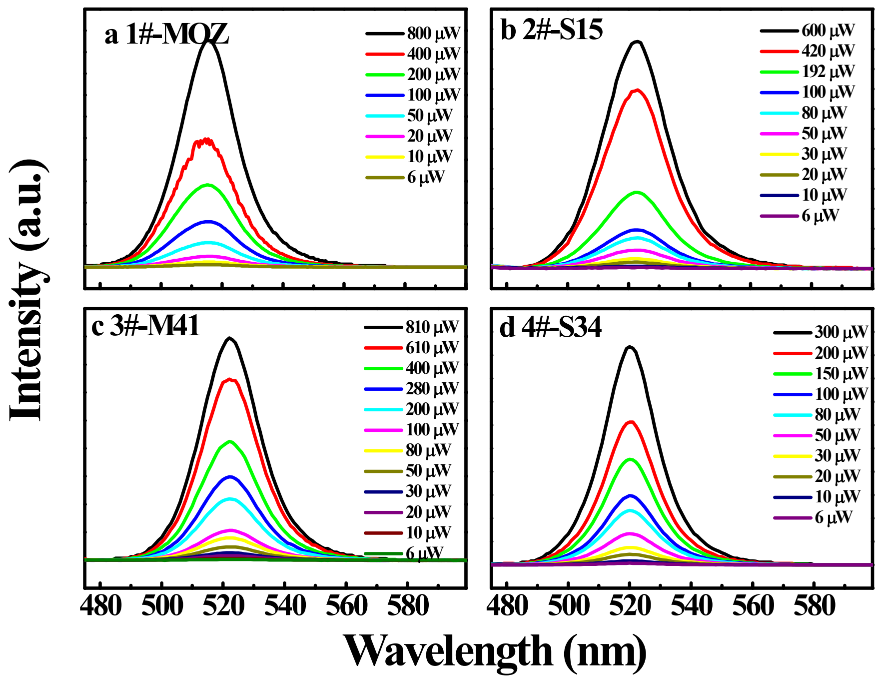

Figure S6. Excitation power dependence PL of the samples.

Figure S7. Transparent quartz substrate.

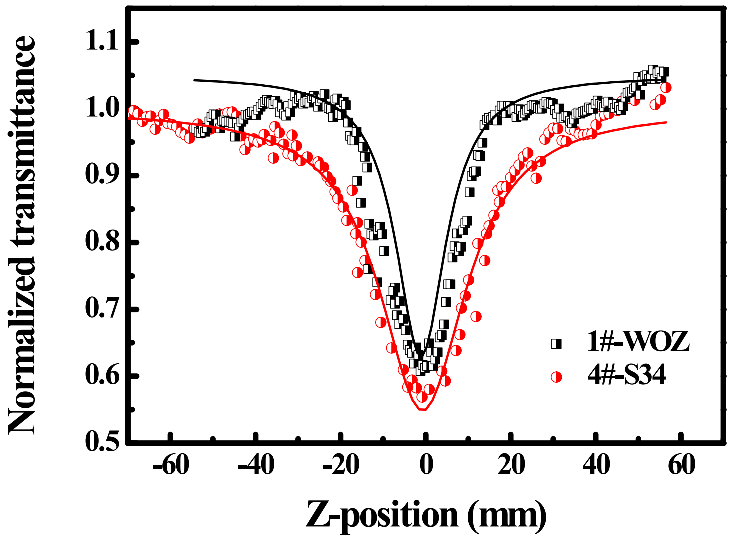

Figure S8. Experimental data (symbol) of open-aperture Z-scans and theoretical fitting curve (solid line).

Figure S1, the water contact angle (CA) is measured by Biolin/Attension Theta equipped with 2000 frame ultra-fast camera, which is Static contact angle.

Figure S2, software of *Image J* is used to measure particle diameter of the QDs, and have a little deviation from the calculated values due to the manually measured.

Figure S3, the ratio of the square of the distance of the diffraction ring to the center is 1: 2: 4, which means that the QDs are same phase.

Figure S4, the powder X-ray diffraction (XRD) data were recorded by a Bruker D8 Discover X-ray diffractometer with a Hi-Star 2D area detector using Cu Kα radiation (1.54 Å).

Figure S5, the optical absorption spectra are measured by UV-visible spectrophotometer Shimadzu UV-2450.

Figure S8, Nonlinear optical effects are limited to two-photon absorption, and the normalized change in transmitted intensity can be approximated by the following equation,

$$T = 1 - \frac{q_0}{2\sqrt{2}} \frac{1}{\left[1 + \frac{Z^2}{Z_0^2}\right]} \tag{1}$$

the two-photon absorption coefficient can be determined from the relation,

$$q_0 = \beta I_0 L_{eff} \tag{2}$$

$$L_{eff} = \frac{1\text{-}e^{-\alpha L}}{\alpha} \tag{3}$$

Where the α is absorption coefficient, β is two-photon absorption coefficient, I_0 is the peak on-axis irradiance at focus (85 GW/cm^2 in this paper), L_{eff} is effective thickness of the sample, Z is position of sample with respect to the focal position, Z_0 is Rayleigh range. Once the open aperture data is collected, it can be readily fit to Equation (1).

References

[1] Y. Wang, X. Yang, T. C. He, Y. Gao, H. V. Demir, X. W. Sun, H. D. Sun, *Appl. Phys. Lett.* 2013, **102**, 021917.