Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supplementary Information for

Ultra-stable $CsPbBr_3$@PbBrOH nanorods for fluorescent labeling application based on methylimidazole-assisted synthesis

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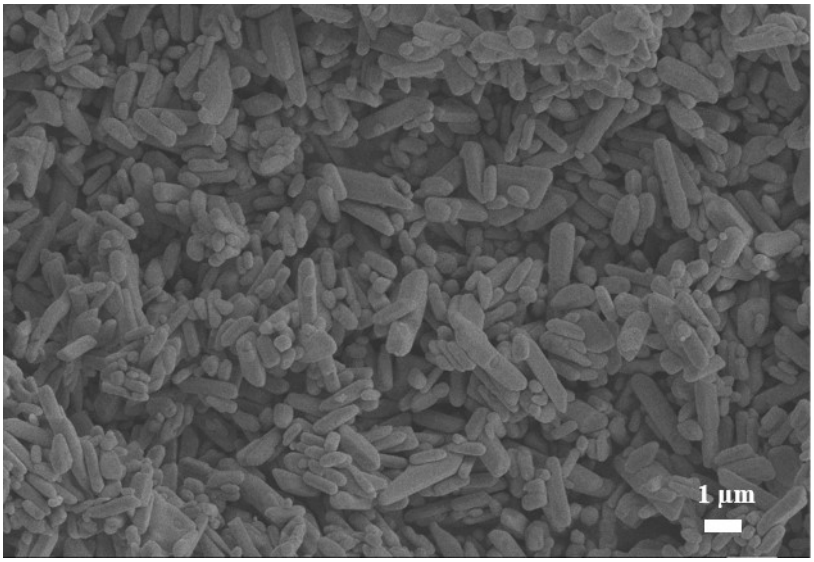

Figure S1 SEM images of $CsPbBr_3$@PbBrOH nanorods.

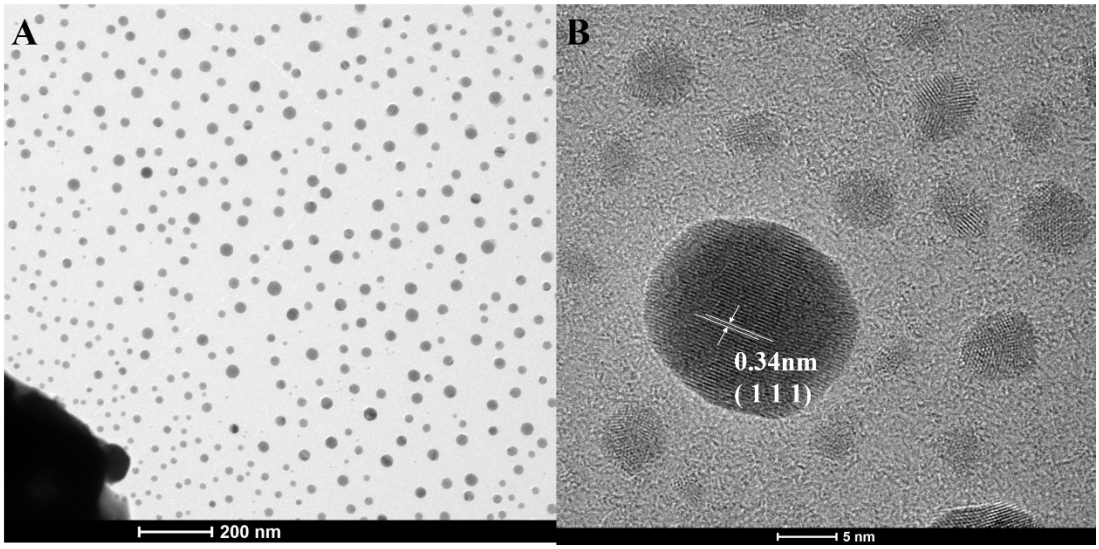

Figure S2 (A) TEM and (B) HRTEM images of $CsPbBr_3$@PbBrOH nanorods with the focused electron beam hit for a long time.

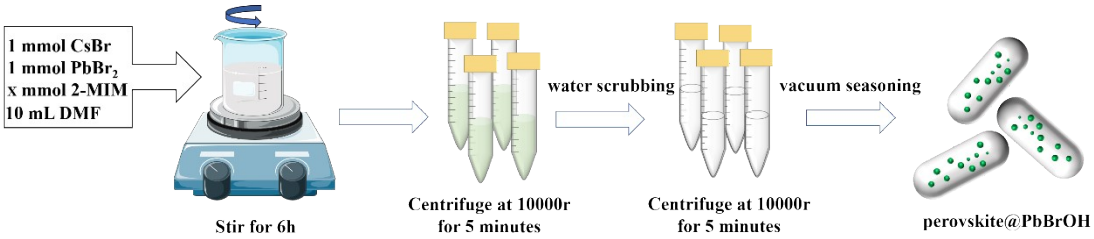

Figure S3 The synthesis process of perovskite@PbBrOH nanorods.

Figure S4 The photographs of the products in DMF after the reaction.

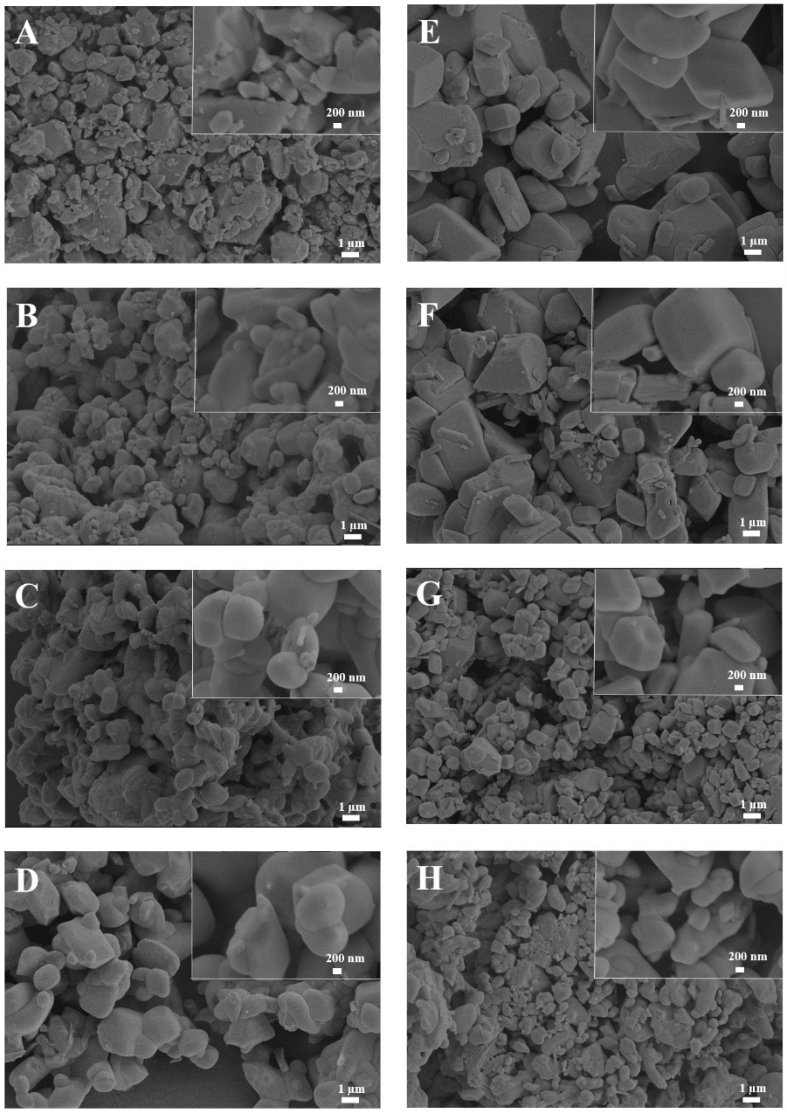

Figure S5 (A-H) SEM images of intermediate prepared with the molar ratio of 2-MIM to $PbBr_2$ of 0.1:1, 1:1, 2:1, 4:1, 8:1, 12:1, 16:1 and 20:1, respectively (Insets are SEM images at higher magnifications).

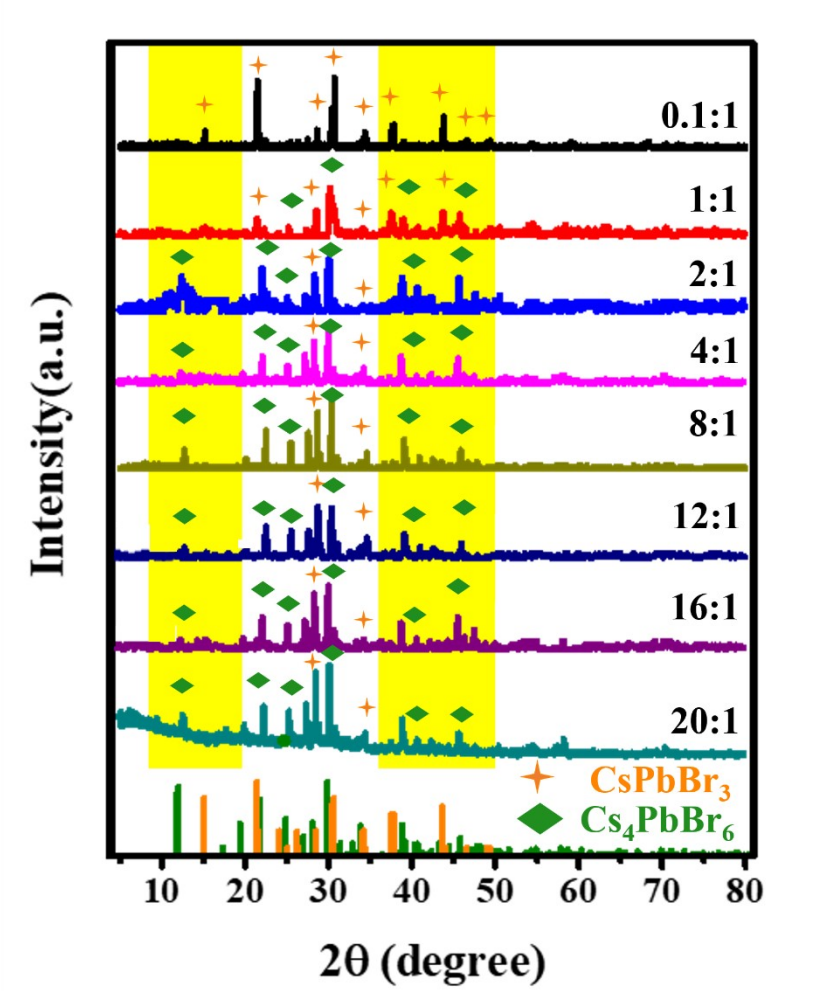

Figure S6 XRD patterns of intermediate prepared with the molar ratio of 2-MIM to $PbBr_2$ of 0.1:1, 1:1, 2:1, 4:1, 8:1, 12:1, 16:1 and 20:1, respectively.

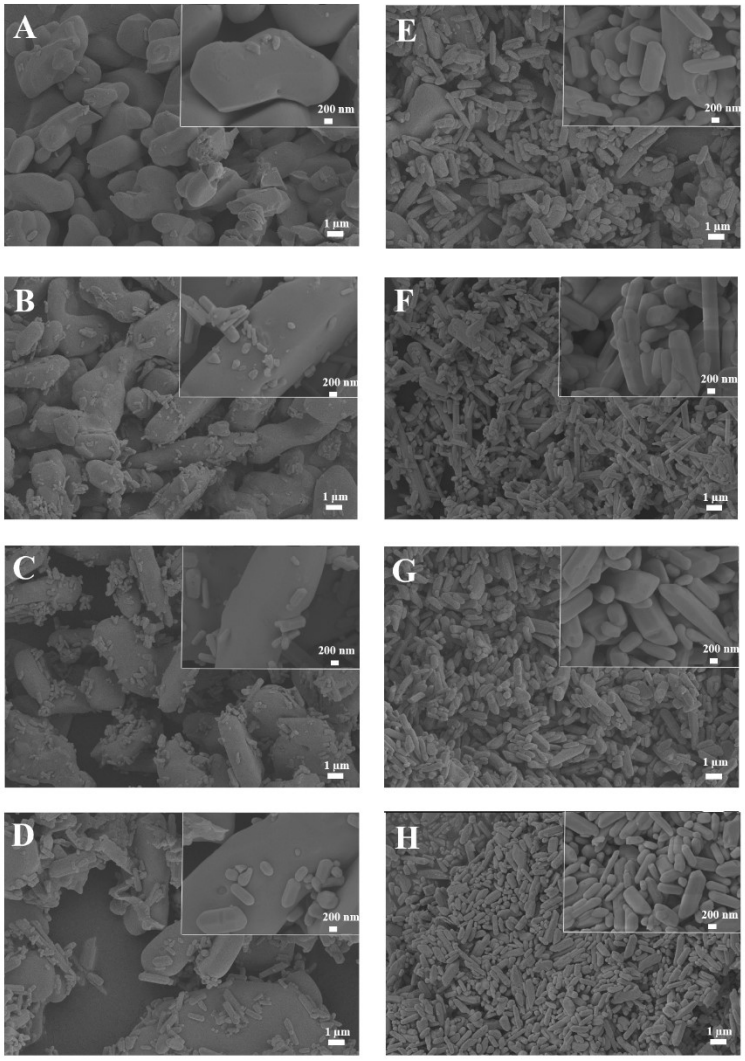

Figure S7 (A-H) SEM images of final products prepared with the molar ratio of 2-MIM to $PbBr_2$ of 0.1:1, 1:1, 2:1, 4:1, 8:1, 12:1, 16:1 and 20:1, respectively (Insets are SEM images at higher magnifications).

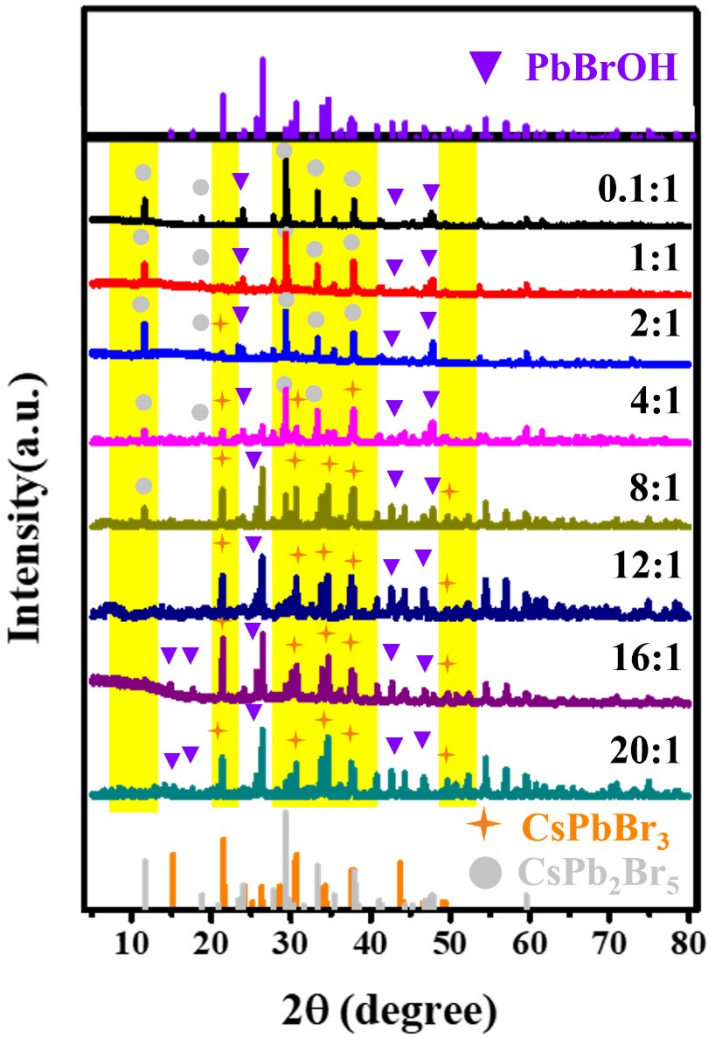

Figure S8 XRD patterns of final products prepared with the molar ratio of 2-MIM to $PbBr_2$ of 0.1:1, 1:1, 2:1, 4:1, 8:1, 12:1, 16:1 and 20:1, respectively.

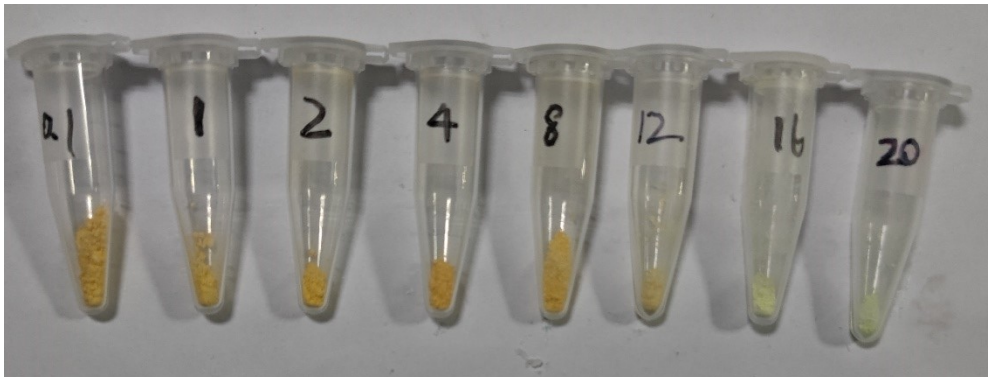

Figure S9 The photographs of the final products under visible light.

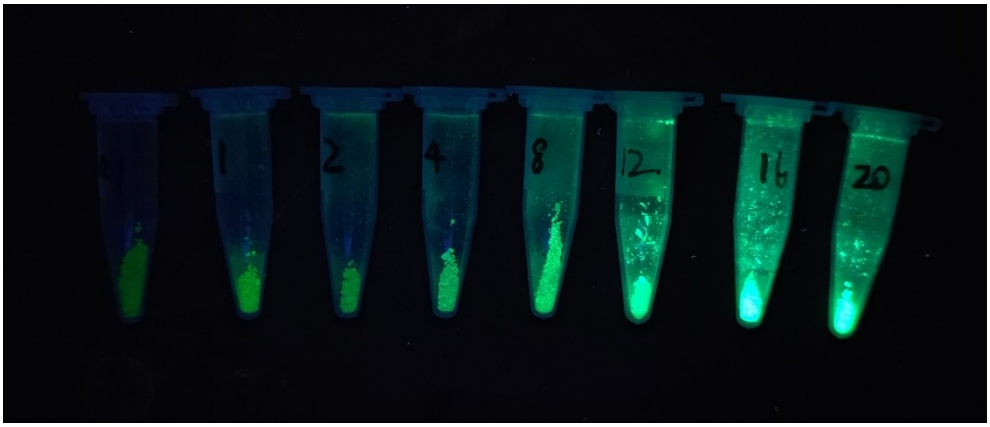

Figure S10 The photographs of the final products under UV light.

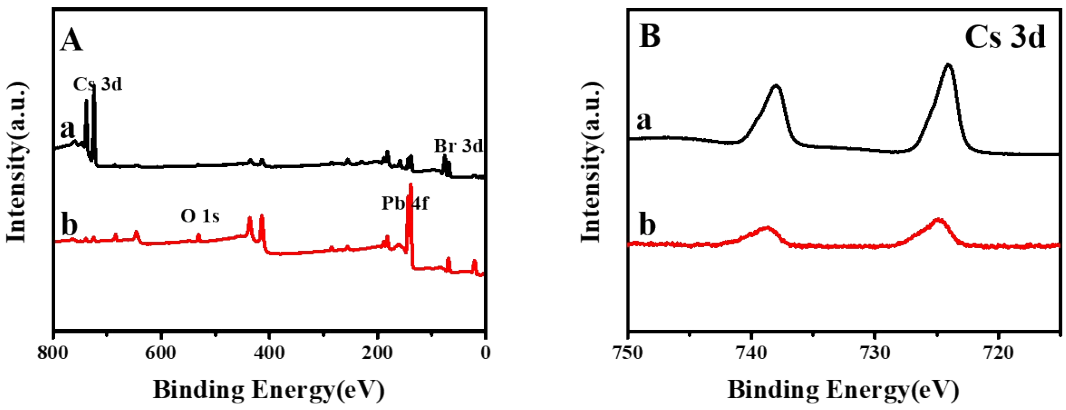

Figure S11 (A) XPS survey spectra of composites before (curve a) and after (curve b) treated by water. (B) High-resolution XPS spectrum of Cs 3d of composites before (curve a) and after (curve b) treated by water.

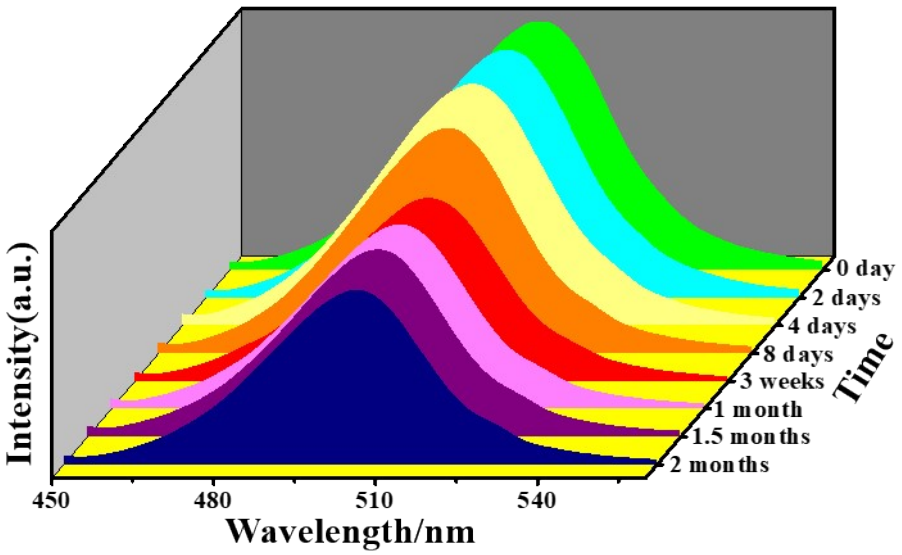

Figure S12 Temporal evolution of PL spectra of $CsPbBr_3$@PbBrOH kept in water.

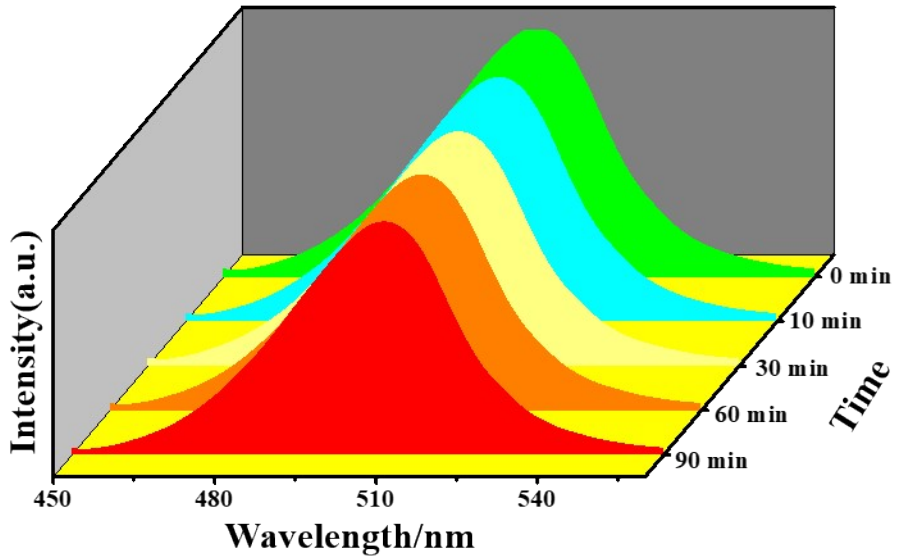

Figure S13 Temporal evolution of PL spectra of $CsPbBr_3$@PbBrOH under ultrasonication.

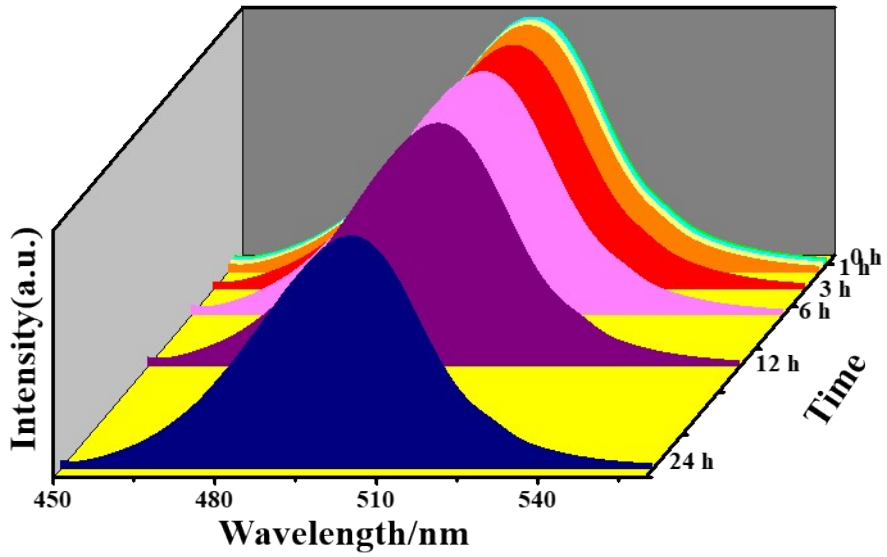

Figure S14 Temporal evolution of PL spectra of $CsPbBr_3$@PbBrOH under 365 nm irradiation.

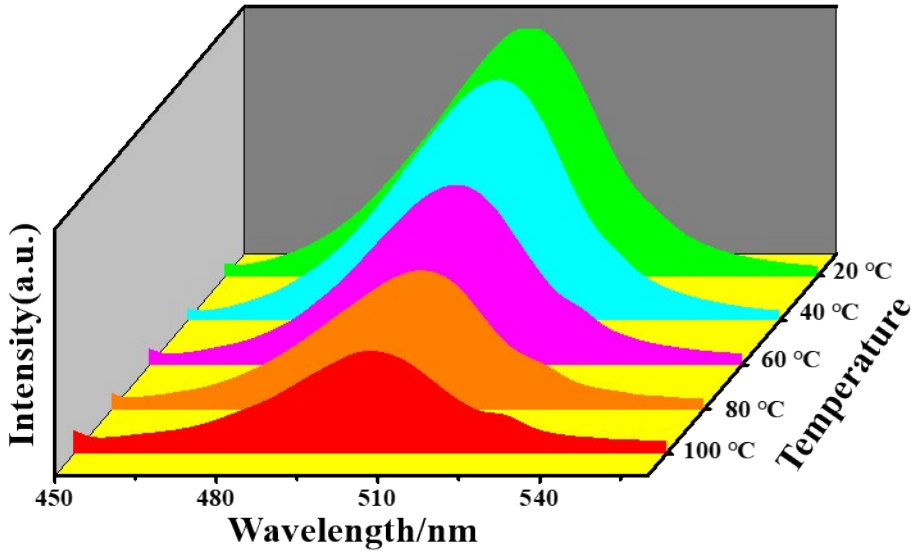

Figure S15 Temperature evolution of PL spectra of $CsPbBr_3$@PbBrOH.

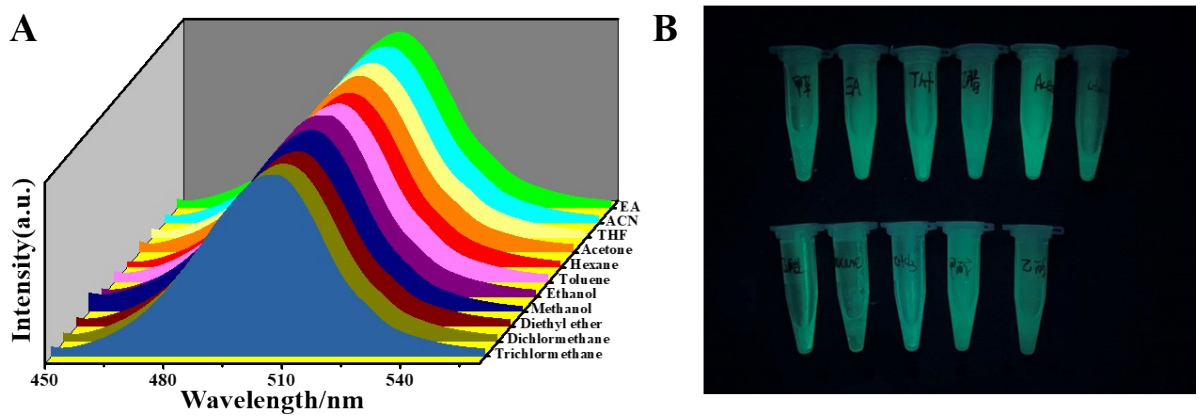

Figure S16 (A) The PL spectra of the $CsPbBr_3$@PbBrOH immersed in different solvents. (B) The digital photographs of $CsPbBr_3$@PbBrOH nanorods immersed in different solvents under 365 nm UV lamp.

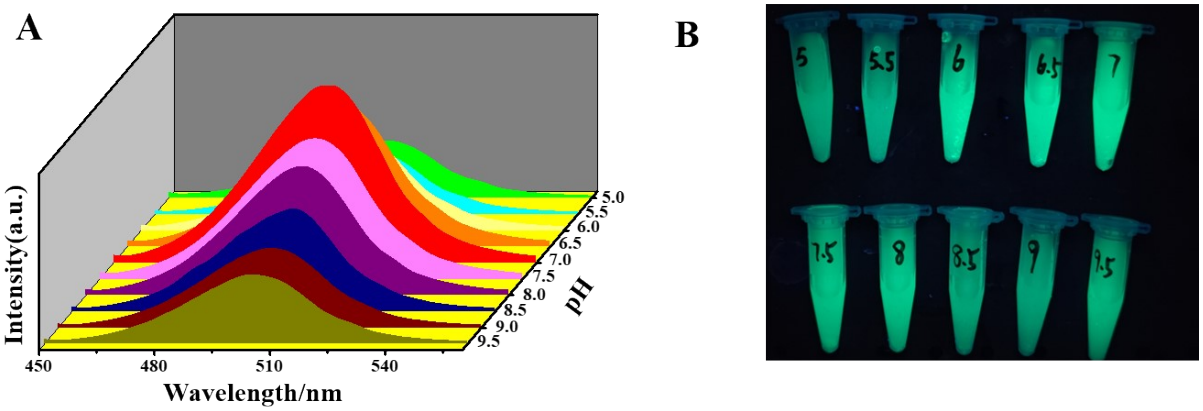

Figure S17 (A) The PL spectra of the $CsPbBr_3$@PbBrOH immersed in PBS of different pH. (B) The digital photographs of $CsPbBr_3$@PbBrOH nanorods immersed in PBS solution of different pH under 365 nm UV lamp after 1h.

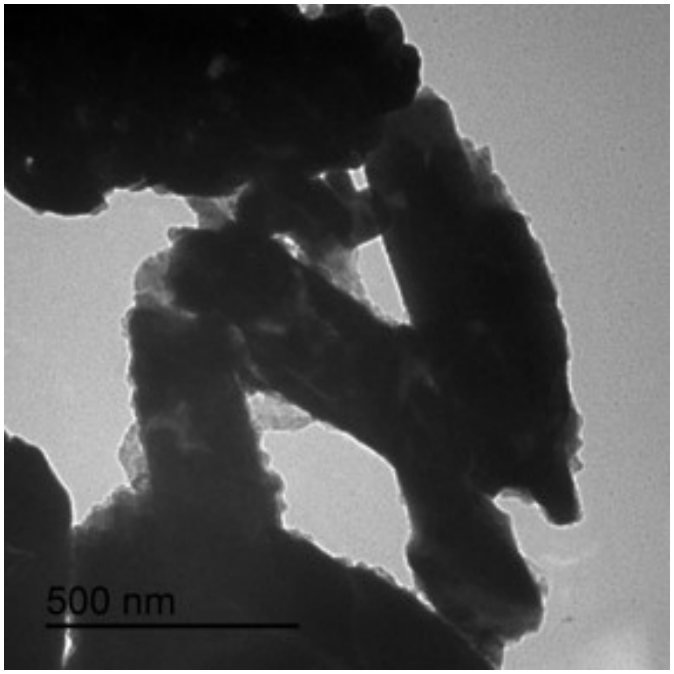

Figure S18. TEM images of $CsPbBr_3$@PbBrOH@PDA.

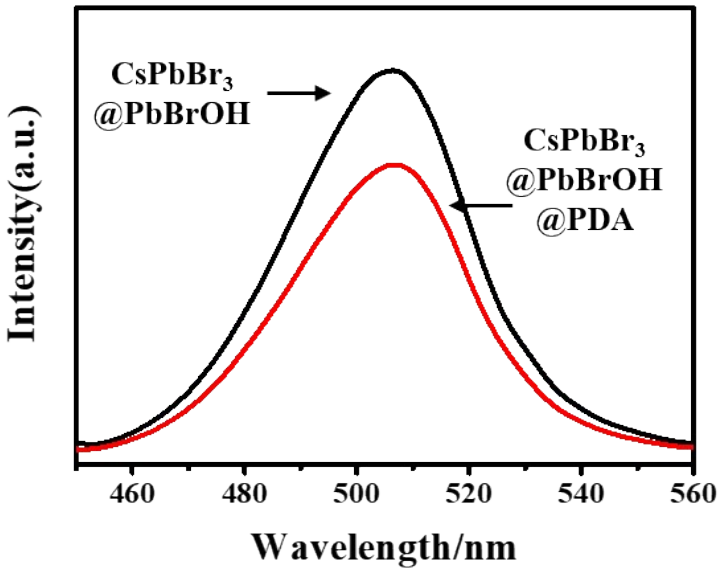

Figure S19. The PL spectra of the $CsPbBr_3$@PbBrOH and $CsPbBr_3$@PbBrOH@PDA.

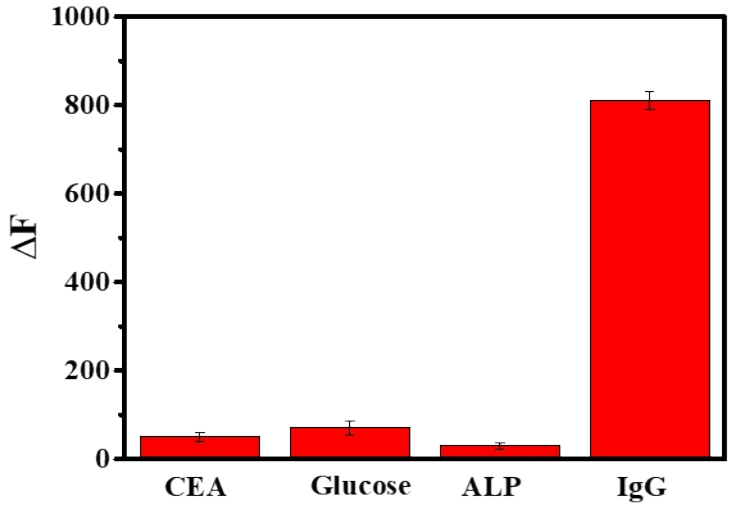

Figure S20. Investigation of the selectivity of sandwich FLISA.

Table S1 Atomic ratios of Cs, Pb and Br elements of the composites characterized by XPS.

Sample	Cs (At%)	Br (At%)	Pb (At%)	Br/Pb
$CsPbBr_3/Cs_4PbBr_6$	35.1	36.77	6.56	5.70
$CsPbBr_3$@PbBrOH	1.84	27.33	22.04	1.24

Table S2 Recovery Test of IgG by the FLISA (n = 5)

Sample	Added (ng/mL)	Found (ng/mL)	Recovery (%)	RSD (%)
-	-	5.81	-	-
1	5	10.78±0.16	99.40	3.21
2	25	31.18±0.34	101.48	1.35
3	50	56.13±0.86	100.64	1.71

Table S3 Comparison of analytical performances of different methods used for the determination of IgG.

Materials used	Method applied	LOD (ng/mL)	Refs
Ti_3C_2-MXene	LRSPR	75	[1]
gold nanorod	SPR	4.6	[2]
Y-shaped peptides	Electrochemistry	0.032	[3]
MoS_2@N-GQDs-IL	Electrochemistry	0.02	[4]
CuS	ELISA	0.15	[5]
quantum dot nanobeads	FLISA	0.004	[6]
$CsPbBr_3$@PbBrOH	FLISA	0.003	This work

References

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