

Supporting Information

Luminescent humidity chromism of organic-inorganic hybrid PEA₂MnBr₄ single crystals

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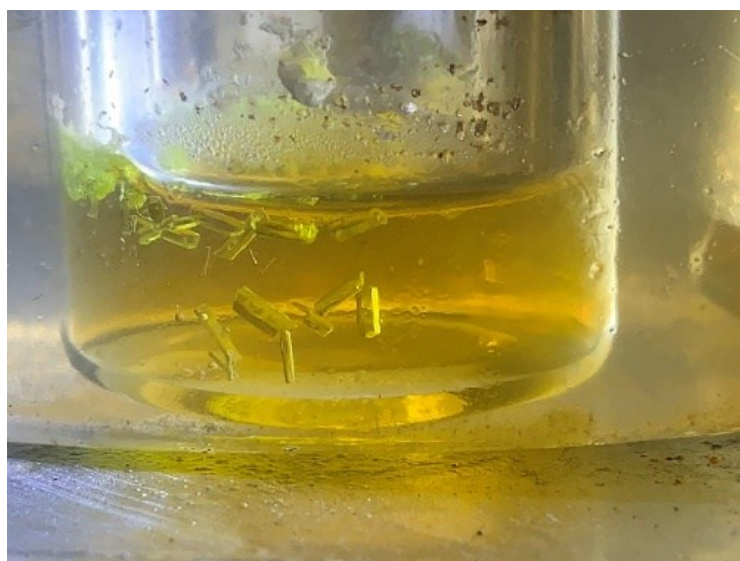


Figure S1. The photograph of PEA₂MnBr₄ crystals grown by slow evaporation method.

Table S1. Crystallographic data of PEA₂MnBr₄.

Empirical formula	C ₁₆ H ₂₂ Br ₄ MnN ₂
Formula weight	616.92
Temperature/K	273.00(10)
Crystal system	monoclinic
Space group	P2 ₁ /c
a/Å	7.7863(1)
b/Å	25.6928(1)
c/Å	11.0626(1)
α /°	90
β /°	91.291(1)
γ /°	90
Volume/Å ³	2212.53(4)
Z	4
ρ_{calc} g/cm ³	1.852
μ /mm ⁻¹	13.306
F(000)	1188.0
Data collection range/°	3.44 < Θ < 73.899
Index ranges	-9 ≤ h ≤ 9, -31 ≤ k ≤ 32, -13 ≤ l ≤ 13
Goodness-of-fit on F ²	1.050
Final R indexes [$I \geq 2\sigma(I)$]	R ₁ = 0.0468, wR ₂ = 0.1214
Final R indexes [all data]	R ₁ = 0.0493, wR ₂ = 0.1235

Table S2. Selected bond lengths and bond angles of PEA₂MnBr₄.

Bond	Length (Å)	Bond	Angle (°)
Br(01)-Mn(05)	2.4957(9)	Br(01)-Mn(05)-Br(02)	106.41(4)
Br(02)-Mn(05)	2.4994(9)	Br(03)-Mn(05)-Br(01)	111.70(4)
Br(03)-Mn(05)	2.4769(9)	Br(03)-Mn(05)-Br(02)	105.20(3)
Br(04)-Mn(05)	2.4859(10)	Br(03)-Mn(05)-Br(04)	109.64(3)
		Br(04)-Mn(05)-Br(01)	111.90(4)
		Br(04)-Mn(05)-Br(02)	111.77(4)

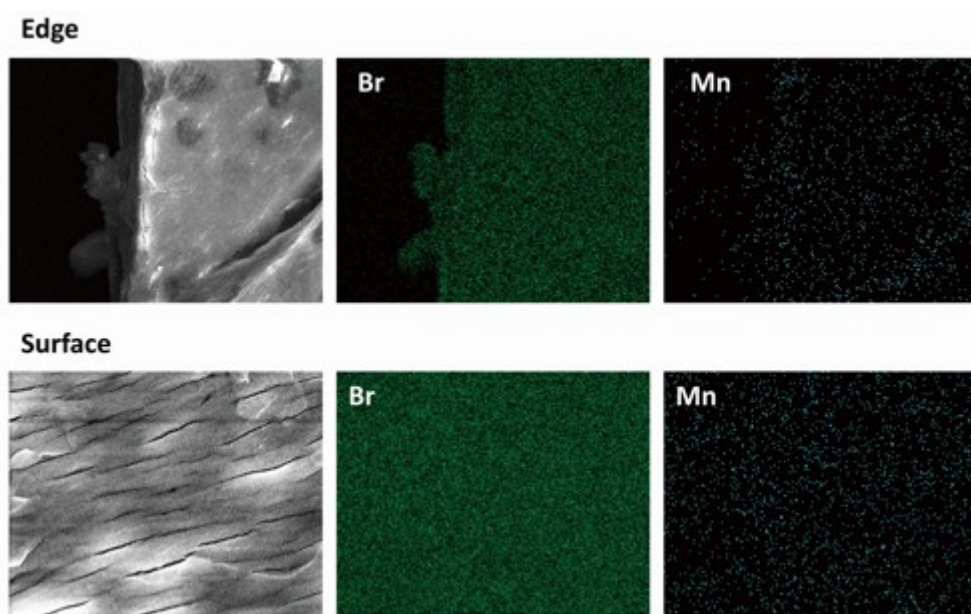


Figure S2. EDS mapping of PEA₂MnBr₄ single crystal surface and edge.

Table S3. Elemental analysis by EDS of PEA₂MnBr₄.

No.	Mn (%)	Br (%)	Total (%)
1	20.71	79.29	100
2	20.95	79.05	

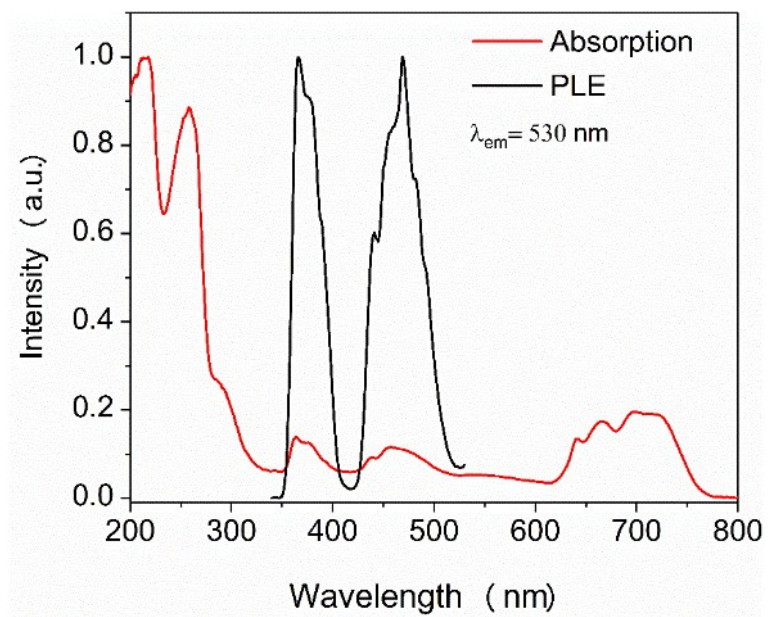


Figure S3. Absorption and excitation spectra of $\text{PEA}_2\text{MnBr}_4$.

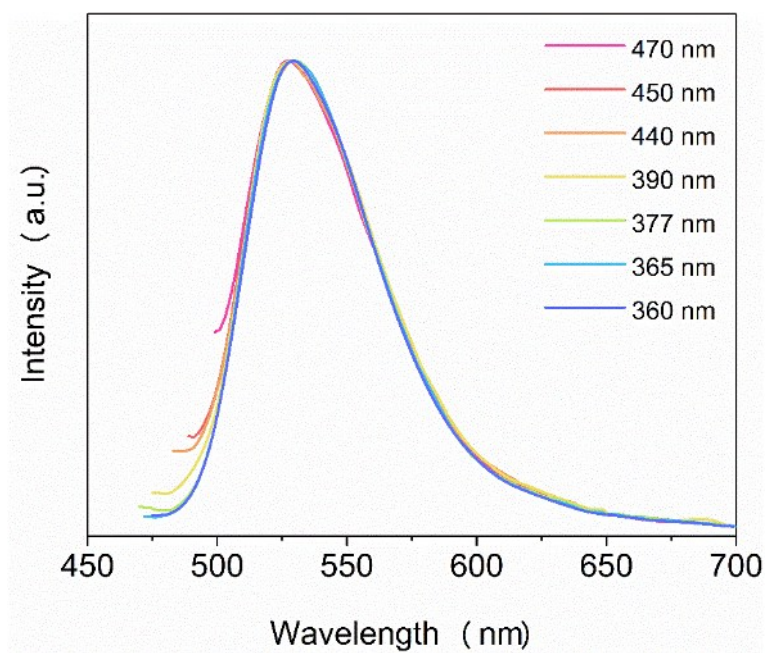


Figure S4. Excitation wavelength-dependent PL spectra of PEA₂MnBr₄.

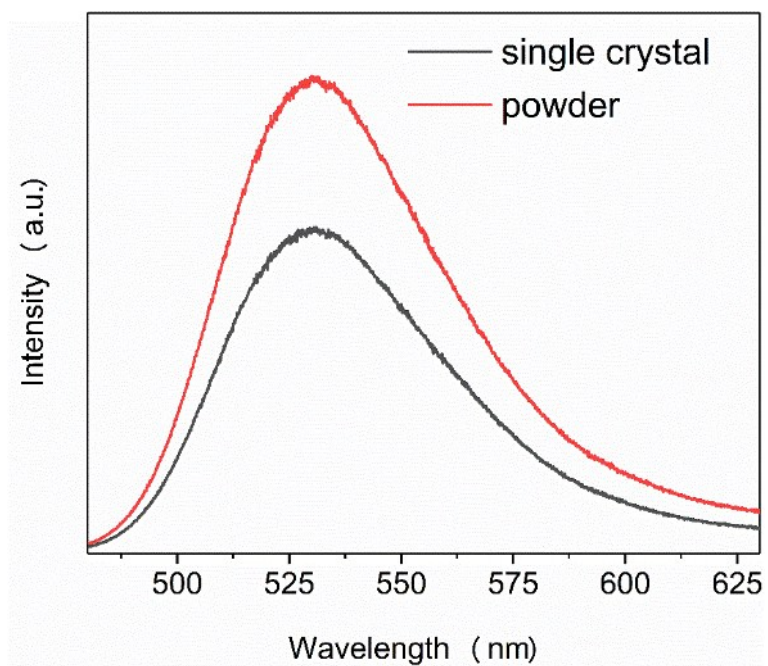


Figure S5. PL of PEA₂MnBr₄ single crystals and ball-milled powder at room temperature.

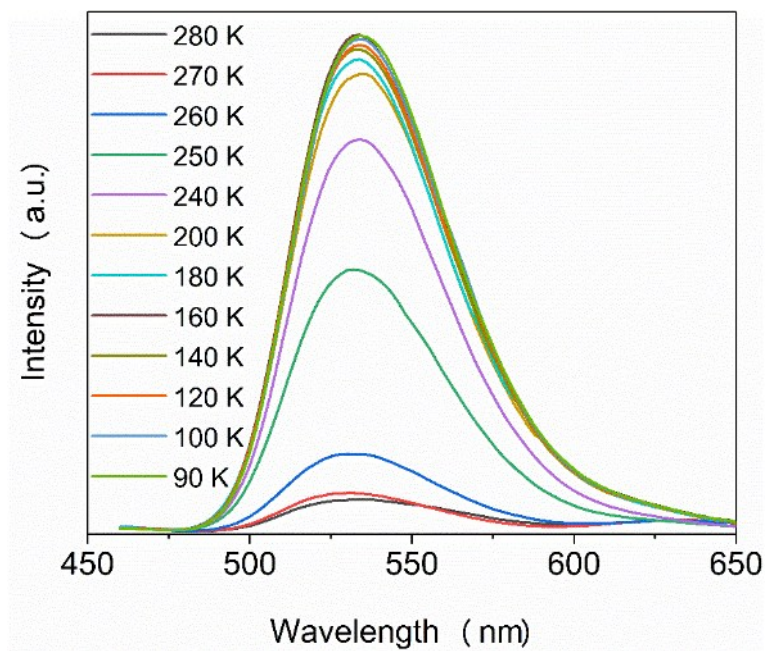


Figure S6. Temperature-dependent PL spectra of PEA₂MnBr₄ single crystal.

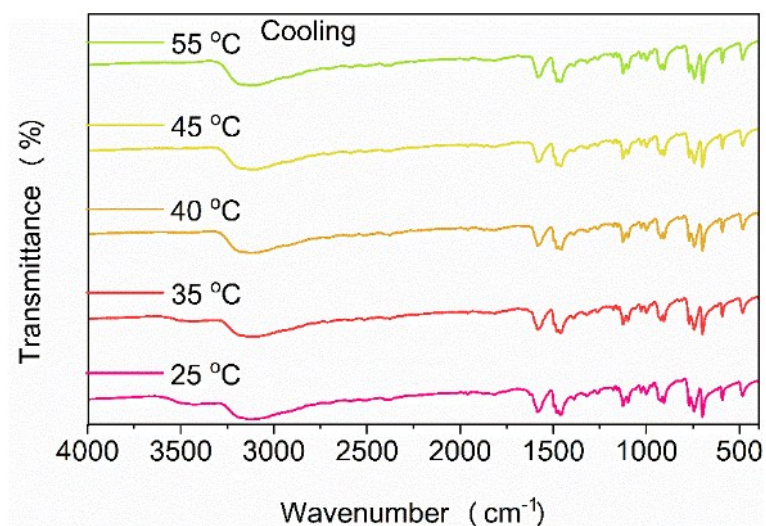


Figure S7. In-situ FTIR spectra of PEA₂MnBr₄ recorded at different temperatures.

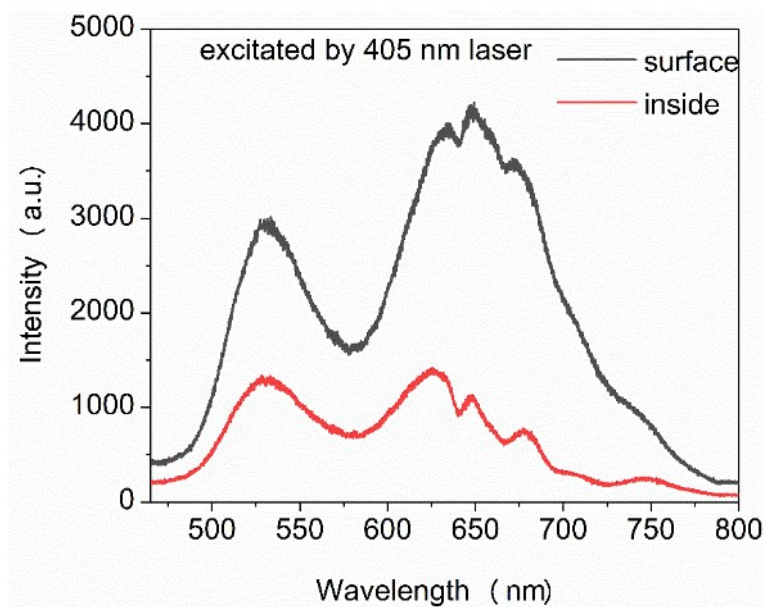


Figure S8. Surface and interior of $\text{PEA}_2\text{MnBr}_4$ excited by 405 nm laser.

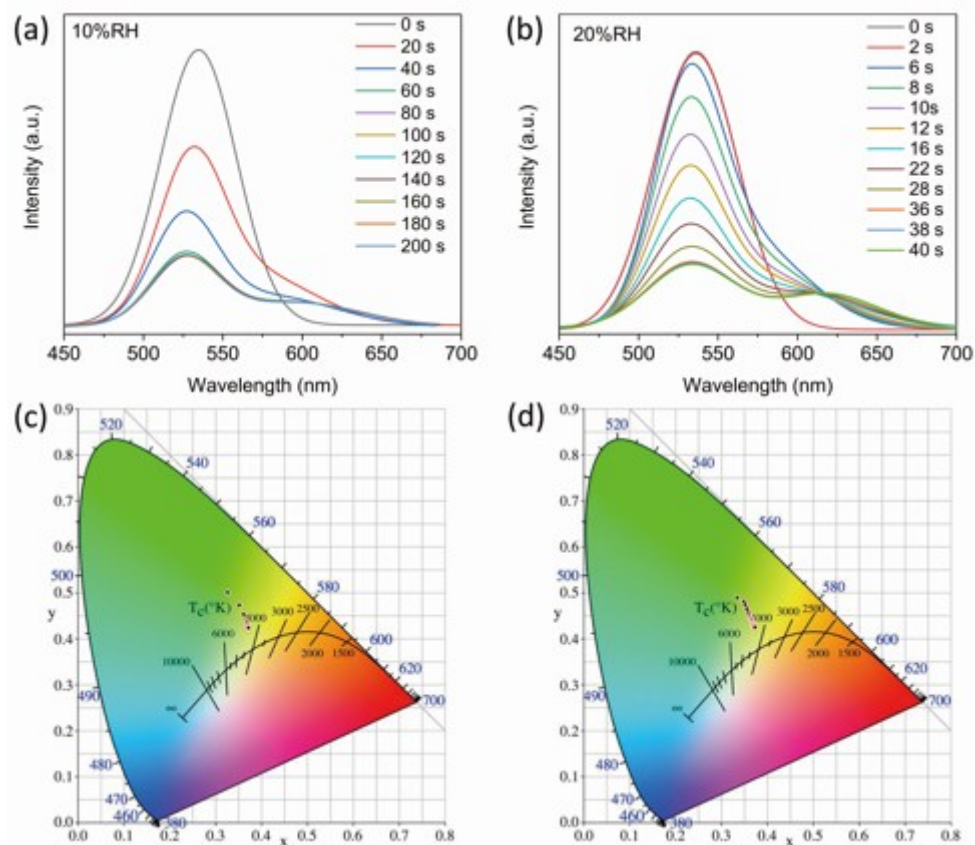


Figure S9. (a) and (b) PL spectra of dehydrated $\text{PEA}_2\text{MnBr}_4$ recorded in real-time under exposing to air (10% RH and 20% RH). (c) and (d) Humidity-dependent CIE chromaticity diagram of dehydrated $\text{PEA}_2\text{MnBr}_4$ under air (10% RH and 20% RH).

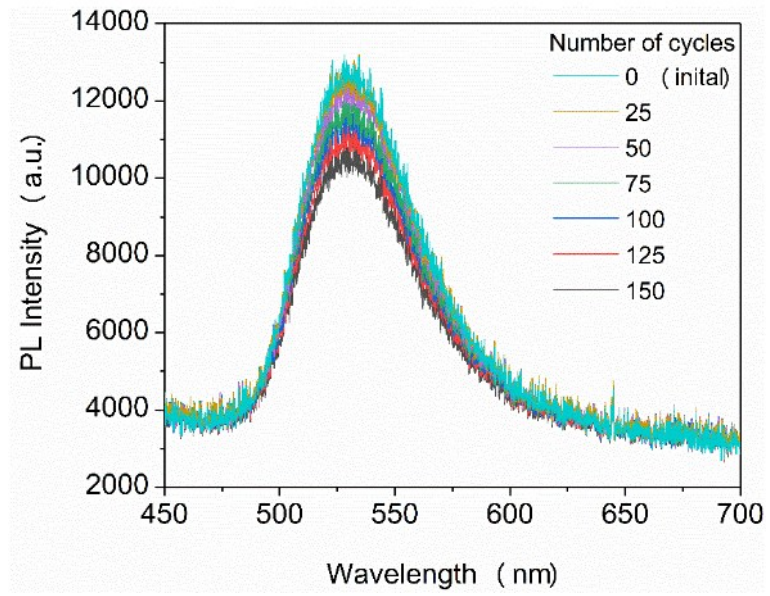


Figure S10. PL intensity along cycling of water adsorption and desorption.