Electronic Supplementary Information ESI for:

Chirality Control in White-Light Emitting 2D Perovskites

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Table of Contents

1. Figures and Tables

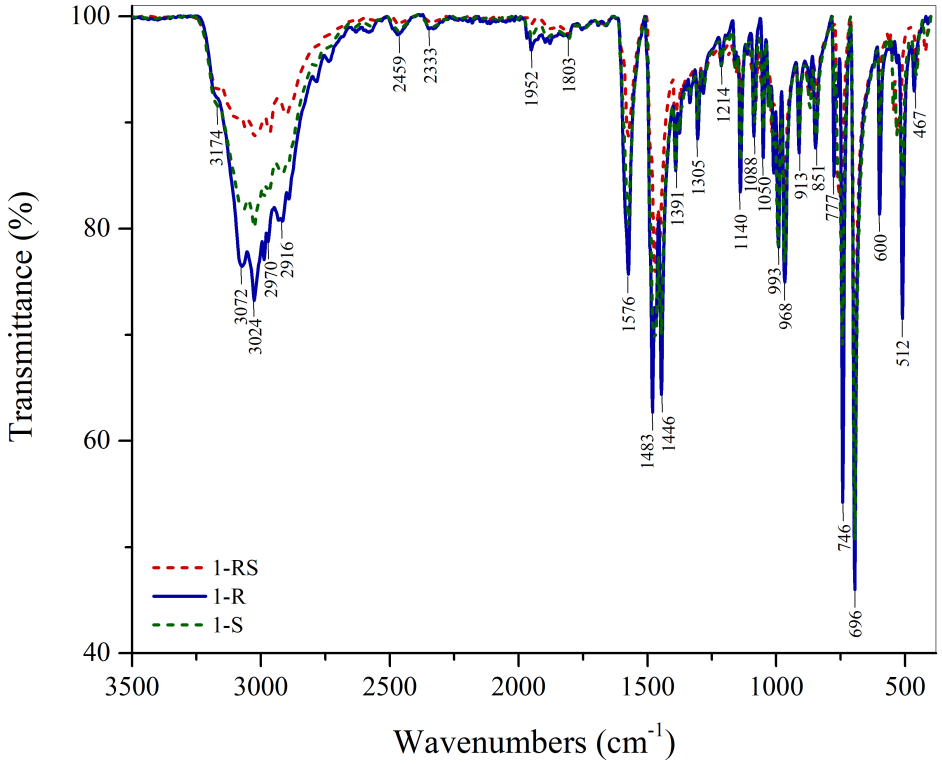

Figure S1. FTIR of **1RS**, **1R** and **1S**

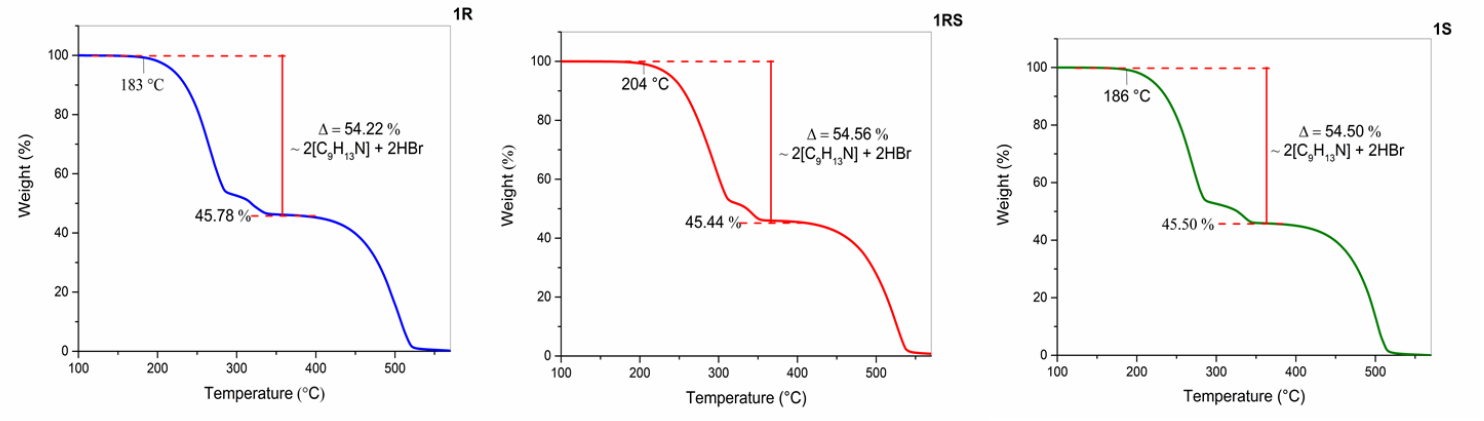

Figure S2. TGA of **1R**, **1RS** and **1S**

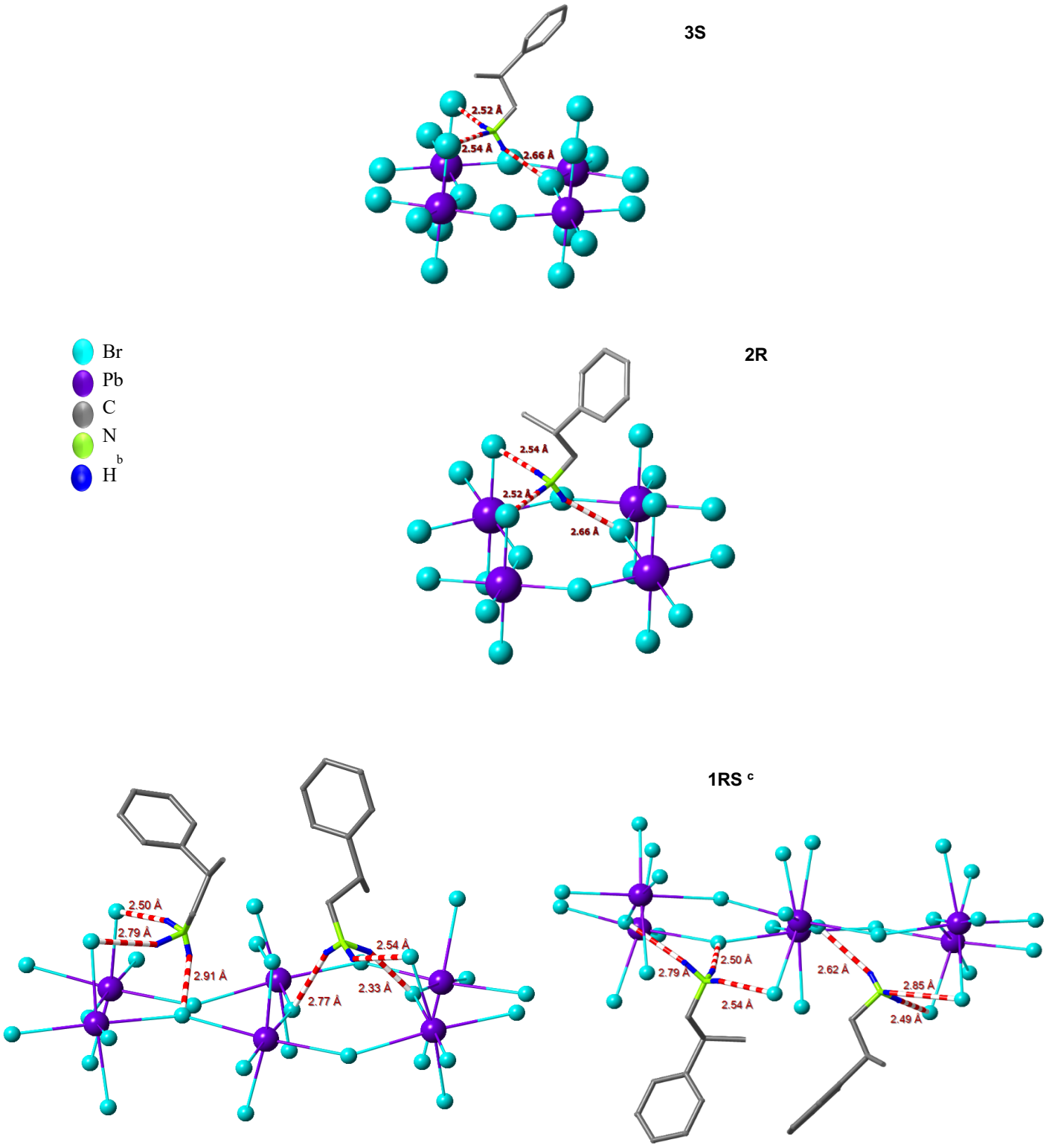

Figure S3. Hydrogen bonds (N–H···Br) of **1S**, **1R** and **1RS.** [b] C–H bonds are omitted for clarity. [c] Disorder was omitted for clarity.

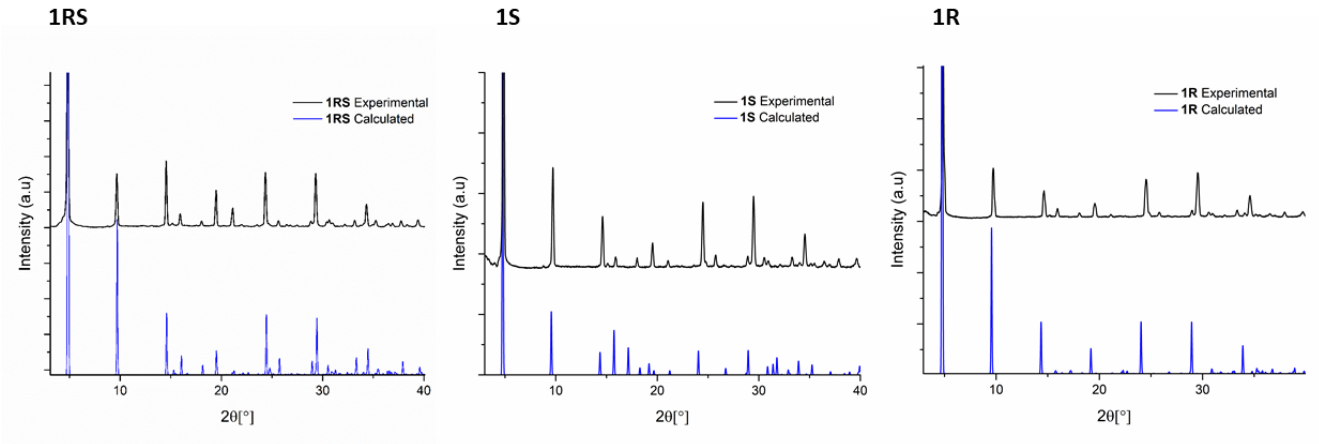

Figure S4. Experimental and calculated powder X-ray diffraction patterns of **1RS**, **1S** and **1R**.

Table S1. Reported Room-Temperature Photoluminescence Quantum Efficiencies (PLQE) and CIE Chromaticity Coordinates for White-Light-Emitting Perovskites

Perovskite	PLQE	CIE	Ref
(EDBE)$PbBr_4$	9	(0.39, 0.42)	1
(EDBE)$PbCl_4$	2	(0.33, 0.39)	1
(CyBMA)$PbBr_4$	1.5	(0.23, 0.29)	2
(N-MEDA)$PbBr_4$	0.5	(0.36, 0.41)	3
(N-MEDA)$PbCl_{1.2}$ $Br_{2.8}$	1.5	--	3
$(PEA)_2PbCl_4$	<1	(0.37, 0.42)	4

2. X- Ray diffraction data

Table S2. Crystal data and structure refinement details for **1R**

Formula	$C_{18}H_{28}Br_4N_2Pb$
Moiety formula	Br_4Pb, $2(C_9H_{14}N)$
Fw	799.25
Crystal system	orthorhombic
Space group	$P2_12_12$
Temp, K	100(2)
λ, Å	1.54178
a, Å	5.6828(2)
b, Å	36.9869(16)
c, Å	5.6490(3)
α, deg	90
β, deg	90
γ, deg	90
V, Å^3	1187.36(9)
Z	2
ϱ, g·cm^{-3}	2.236
μ, mm^{-1}	21.726
F(000)	744
Crystal size, mm^3	0.175 x 0.122 x 0.015
Θ range for data collection, deg	1.194 to 72.799
index ranges	$-6 \le h \le 7$
	$-44 \le k \le 45$
	$-6 \le l \le 6$
No. of reflns collected	17048
No. of indep. reflns (R_{int})	2298 (0.0279)
No. of data / restraints / parameters	2298 / 0 / 127
GoF on F^2	1.229
R_1,[a] wR_2[b] ($I > 2\sigma(I)$)	0.0445, 0.1312
Abs. struct. par.	–0.022(8)
Largest diff. peak / hole, e·Å^{-3}	2.962 / –2.992

[a] $R_1 = \sum||F_o| - |F_c||/\sum|F_o|$.[b] $wR_2 = [\sum w(F_o^2 - F_c^2)^2/\sum(F_o^2)^2]^{1/2}$.

Table S3. Crystal data and structure refinement details for **1S**

Formula	$C_{18}H_{28}Br_4N_2Pb$
Moiety formula	Br_4Pb, $2(C_9H_{14}N)$
Fw	799.25
Crystal system	orthorhombic
Space group	$P2_12_12$
Temp, K	100(2)
λ, Å	0.71073
a, Å	5.6922(1)
b, Å	36.9751(7)
c, Å	5.6533(1)
α, deg	90
β, deg	90
γ, deg	90
V, Å^3	1189.85(4)
Z	2
ϱ, g·cm^{-3}	2.231
μ, mm^{-1}	13.811
F(000)	744
Crystal size, mm^3	0.150 x 0.120 x 0.025
θ range for data collection, deg	2.203 to 26.369
index ranges	$-7 \le h \le 7$
	$-46 \le k \le 46$
	$-7 \le l \le 7$
No. of reflns collected	17450
No. of indep. reflns (R_{int})	2405 (0.0357)
No. of data / restraints / parameters	2405 / 0 / 127
GoF on F^2	1.038
R_1,[a] wR_2[b] ($I > 2\sigma(I)$)	0.0146, 0.0300
Abs. struct. par.	0.004(5)
Largest diff. peak / hole, e·Å^{-3}	0.823 / –0.817

[a] $R_1 = \sum||F_o| - |F_c||/\sum|F_o|$.[b] $wR_2 = [\sum w(F_o^2 - F_c^2)^2/\sum(F_o^2)^2]^{1/2}$.

Table S4. Crystal data and structure refinement details for **1RS**

Formula	$C_{18}H_{28}Br_4N_2Pb$
Moiety formula	Br_4Pb, $2(C_9H_{14}N)$
Fw	799.25
Crystal system	orthorhombic
Space group	P*bca*
Temp, K	100(2)
λ, Å	0.71073
a, Å	33.3990(5)
b, Å	8.0291(1)
c, Å	36.3814(5)
α, deg	90
β, deg	90
γ, deg	90
V, Å^3	9756.2(2)
Z	16
ϱ, g·cm^{-3}	2.177
μ, mm^{-1}	13.475
F(000)	5952
Crystal size, mm^3	0.4230 x 0.1422 x 0.1271
θ range for data collection, deg	2.668 to 29.195
index ranges	$-45 \le h \le 30$
	$-8 \le k \le 10$
	$-49 \le l \le 44$
No. of reflns collected	29461
No. of indep. reflns (R_{int})	11324 (0.0374)
No. of data / restraints / parameters	11324 / 4356/ 813
GoF on F^2	1.142
R_1,[a] wR_2[b] ($I > 2\sigma(I)$)	0.0378, 0.0729
Largest diff. peak / hole, e·Å^{-3}	2.210 / –1.861

[a] $R_1 = \sum||F_o| - |F_c||/\sum|F_o|$.[b] $wR_2 = [\sum w(F_o^2 - F_c^2)^2/\sum(F_o^2)^2]^{1/2}$.

Table S5. Pb–Br bond lengths bonds for **1R**

1R Pb–Br lengths/ Å (mal)

Pb1–Br1	2.9803(18)
Pb1–Br1#1	2.9804(18)
Pb1–Br2	2.992(4)
Pb1–Br2#2	2.980(4)
Pb1–Br2#3	2.980(4)
Pb1–Br2#1	2.992(4)
Pb1–Br3	2.9745(14)
Pb1–Br3#4	2.9745(14)
Pb1–Br3A	2.9816(16)
Pb1–Br3A#4	2.9816(16)

#1 –x+1, –y+1, z; #2 –x+1, –y+1, z–1; #3 x, y, z–1; #4 x–1, y, z

Table S6. Pb–Br bond lengths bonds for **1S**

1 S Pb–Br lengths/ Å

Pb1–Br1	2.9808(4)
Pb1–Br1#1	2.9809(4)
Pb1–Br2	2.9923(8)
Pb1–Br2#1	2.9922(8)
Pb1–Br2#2	2.9859(8)
Pb1–Br2#3	2.9859(8)
Pb1–Br3	2.9760(3)
Pb1–Br3#4	2.9760(3)
Pb1–Br3'#5	2.9865(3)
Pb1–Br3'	2.9865(3)

#1 –x+2, –y+1, z; #2 –x+2, –y+1, z+1; #3 x, y, z+1; #4 x+1, y, z; #5 x–1, y, z

Table S7. Pb–Br bond lengths bonds for **1RS**

1RS Pb–Br lengths/ Å	
Pb1—Br1	2.9802(5)
Pb1—Br2	2.9848(5)
Pb1—Br3	2.9307(6)
Pb1—Br4	3.0105(5)
Pb1—Br4#1	3.0266(5)
Pb1—Br5	3.0483(5)
Pb2—Br1	3.0482(5)
Pb2—Br2#2	3.0929(6)
Pb2—Br6	3.0234(6)
Pb2—Br7	2.9771(5)
Pb2—Br7#3	2.9843(5)
Pb2—Br8	2.9239(5)

#1 –x+1, y+1/2, –z+3/2; #2 x, y+1, z; #3 –x+1/2, y+1/2, z

Table S8. Geometrical parameters of hydrogen bonds for **1R**

1R					
D–H···A	Symmetry code	$d_{D–H}$/Å	$d_{H···A}$/Å	$d_{D···A}$/Å	$<_{DHA}$/°
N1–H1A···Br1	x, y, z–1	0.91	2.52	3.426(19)	171.9
N1–H1B···Br2	x–1, y, z–1	0.91	2.66	3.516(17)	157.0
N1–H1B···Br2	–x+1, –y+1, z–1	0.91	2.97	3.417(16)	112.0
N1–H1B···Br3A	x–1, y, z–1	0.91	2.77	3.417(18)	129.2
N1–H1C···Br1		0.91	2.54	3.449(19)	175.7

Table S9. Geometrical parameters of hydrogen bonds for **1S**

1S					
D–H···A	Symmetry code	$d_{D–H}$/Å	$d_{H···A}$/Å	$d_{D···A}$/Å	$<_{DHA}$/°
N1–H1A···Br1	x–1, y, z–1	0.91	2.54	3.454(4)	176.4
N1–H1B···Br2		0.91	2.67	3.520(4)	156.2
N1–H1B···Br2	–x+1, –y+1, z	0.91	2.96	3.406(3)	112.2
N1–H1B···Br3	x, y, z–1	0.91	2.74	3.435(3)	134.0
N1–H1B···Br3'	x–1, y, z	0.91	2.80	3.415(4)	126.3
N1–H1C···Br1	x–1, y, z	0.91	2.52	3.423(4)	172.4

Table S10. Geometrical parameters of hydrogen bonds for **1RS**

1RS					
D–H···A	Symmetry code	d_{D-H}/Å	$d_{H\cdots A}$/Å	$d_{D\cdots A}$/Å	$<_{DHA}$/°
N1–H1A···Br8	x, y–1, z	0.91	2.70	3.53(4)	151.6
N1–H1B···Br1		0.91	2.56	3.39(4)	151.8
N1–H1C···Br8	–x+1/2, y–1/2, z	0.91	2.49	3.36(6)	161.2
N1A–H1D···Br8	x, y–1, z	0.91	2.85	3.51(7)	130.8
N1A–H1E···Br1		0.91	2.62	3.47(6)	155.0
N1A–H1F···Br8	–x+1/2, y–1/2, z	0.91	2.49	3.35(9)	157.8
N2–H2B···Br3		0.91	2.48	3.28(3)	146.6
N2–H2C···Br4	–x+1, y+1/2, –z+3/2	0.91	2.96	3.503(16)	119.9
N2–H2C···Br5	–x+1, y+1/2, –z+3/2	0.91	2.68	3.46(4)	144.4
N2–H2D···Br2	x, y+1, z	0.91	2.59	3.47(4)	162.0
N2A–H2E···Br3		0.91	2.54	3.44(4)	168.6
N2A–H2F···Br4	x, y+1, z	0.91	2.80	3.57(4)	143.6
N2A–H2F···Br4	–x+1, y+1/2, –z+3/2	0.91	3.04	3.468(19)	110.8
N2A–H2F···Br5	–x+1, y+1/2, –z+3/2	0.91	2.91	3.45(4)	119.4
N2A–H2G···Br2	x, y+1, z	0.91	2.50	3.37(4)	158.9
N3–H3B···Br6		0.91	2.40	3.303(10)	170.7
N3–H3C···Br5	x, y+1, z	0.91	2.49	3.316(15)	151.2
N3–H3D···Br4	–x+1, y+1/2, –z+3/2	0.91	2.67	3.464(14)	146.2
N3A–H3E···Br3	–x+1, y+1/2, –z+3/2	0.91	2.79	3.65(3)	158.0
N3A–H3G···Br5	x, y+1, z	0.91	2.50	3.30(4)	147.5
N4–H4B···Br5		0.91	2.42	3.266(12)	154.9
N4–H4C···Br6	x, y–1, z	0.91	2.49	3.347(11)	156.5
N4–H4D···Br1		0.91	2.91	3.497(10)	123.4
N4–H4D···Br7	–x+1/2, y–1/2, z	0.91	2.85	3.445(10)	124.2
N4A–H4E···Br6	x, y–1, z	0.91	2.54	3.19(6)	128.9
N4A–H4F···Br7	–x+1/2, y–1/2, z	0.91	2.33	3.16(5)	152.4
N4A–H4G···Br1		0.91	2.77	3.52(5)	141.0

Table S11. Geometrical parameters of hydrogen bonds for **$(PEA)_2PbBr_4$** [5]

$(PEA)_2PbBr_4$ [5]				
D–H···A	d_{D-H}/Å	$d_{H\cdots A}$/Å	$d_{D\cdots A}$/Å	$<_{DHA}$/°
N1—H1···Br1	0.89	3.18	3.508(5)	104
N1—H3···Br2	0.89	2.54	3.411(5)	165
N2—H13···Br6	0.89	3.17	3.509(5)	105
N2—H14···Br7	0.89	2.54	3.416(5)	167
N3—H26···Br7	0.89	2.71	3.448(6)	142
N3—H27···Br2	0.89	2.62	3.486(6)	164
N4—H37···Br4	0.89	2.68	3.465(5)	148
N4—H39···Br2	0.89	2.73	3.462(6)	140

3. References

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