Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

A novel material $Cs_2Rb_xAg_{1-x}$ $In_{0.875}Bi_{0.125}Cl_6$ with special blue shift and application for white light LED devices

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Table S1 The contents of Rb for the samples

x value	Rb contents (mmol)	Ag contents (mmol)	chemical formula
0	0	1	$Cs_2AgIn_{0.875}Bi_{0.125}Cl_6$
0.05	0.05	0.95	$Cs_2Rb_{0.05}Ag_{0.95}In_{0.875}Bi_{0.125}Cl_6$
0.1	0.1	0.9	$Cs_2Rb_{0.1}Ag_{0.9}In_{0.875}Bi_{0.125}Cl_6$
0.15	0.15	0.85	$Cs_2Rb_{0.15}Ag_{0.85}In_{0.875}Bi_{0.125}Cl_6$
0.2	0.2	0.8	$Cs_2Rb_{0.2}Ag_{0.8}In_{0.875}Bi_{0.125}Cl_6$
0.25	0.25	0.75	$Cs_2Rb_{0.25}Ag_{0.75}In_{0.875}Bi_{0.125}Cl_6$
0.3	0.3	0.7	$Cs_2Rb_{0.3}Ag_{0.7}In_{0.875}Bi_{0.125}Cl_6$
0.4	0.4	0.6	$Cs_2Rb_{0.4}Ag_{0.6}In_{0.875}Bi_{0.125}Cl_6$
0.6	0.6	0.4	$Cs_2Rb_{0.6}Ag_{0.4}In_{0.875}Bi_{0.125}Cl_6$
0.8	0.8	0.2	$Cs_2Rb_{0.8}Ag_{0.2}In_{0.875}Bi_{0.125}Cl_6$
1	1	0	$Cs_2RbIn_{0.875}Bi_{0.125}Cl_6$

*Each sample was intended to yield 1 mmol of product.

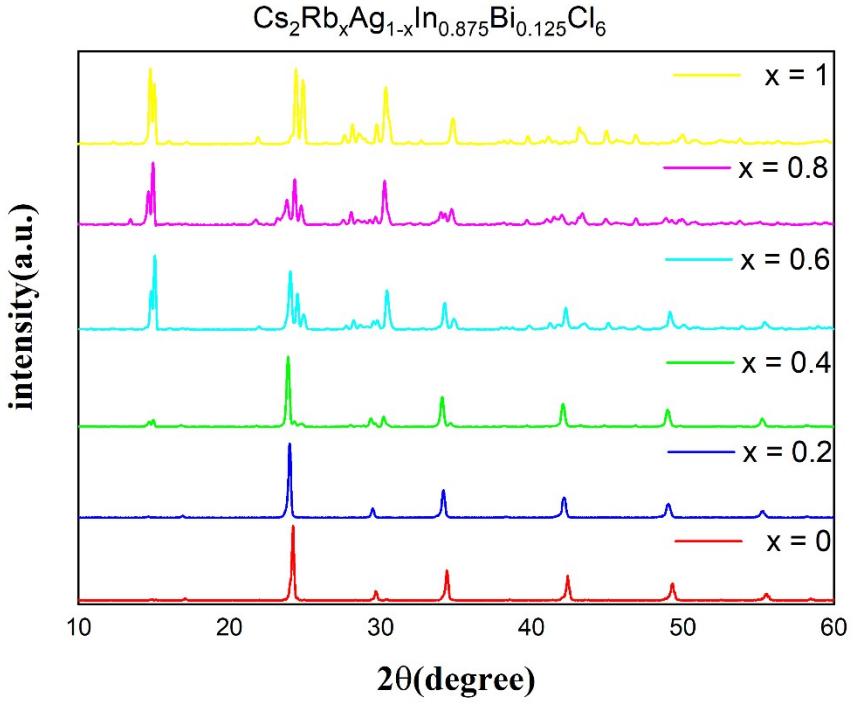

Fig S1 XRD image of $Cs_2Rb_xAg_{1-x}In_{0.875}Bi_{0.125}Cl_6$ (x=0, 0.2, 0.4, 0.6, 0.8, 1).

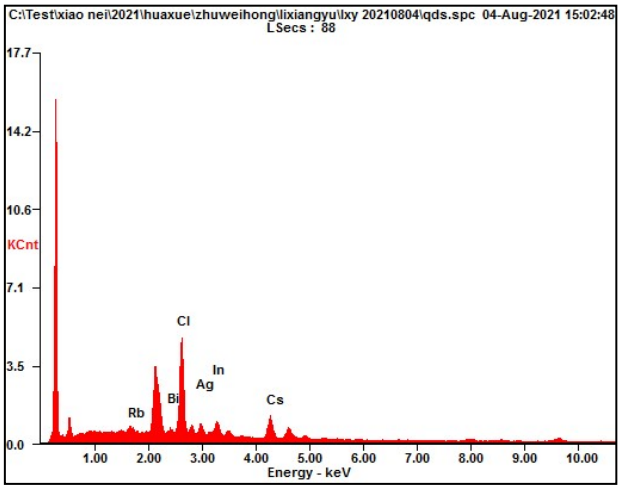

Fig S2 The EDS spectra of $Cs_2Rb_{0.2}Ag_{0.8}In_{0.875}Bi_{0.125}Cl_6$.

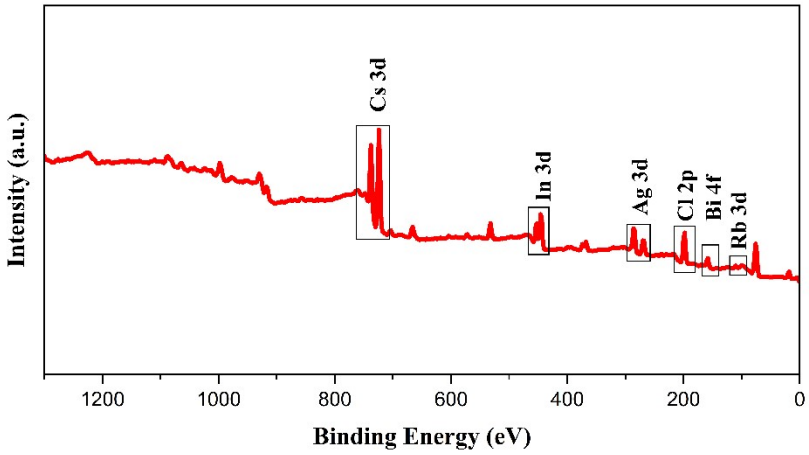

Fig S3 The XPS spectra of $Cs_2Rb_{0.2}Ag_{0.8}In_{0.875}Bi_{0.125}Cl_6$

Table S1 Summary of the EDS analysis of $Cs_2Rb_{0.2}Ag_{0.8}In_{0.875}Bi_{0.125}Cl_6$.

Element	Wt%	At%
RbL	02.74	02.34
BiM	05.04	01.76
ClK	28.27	58.26
AgL	10.27	06.96
InL	13.55	08.62
CsL	40.13	22.06
Matrix	Correction	ZAF

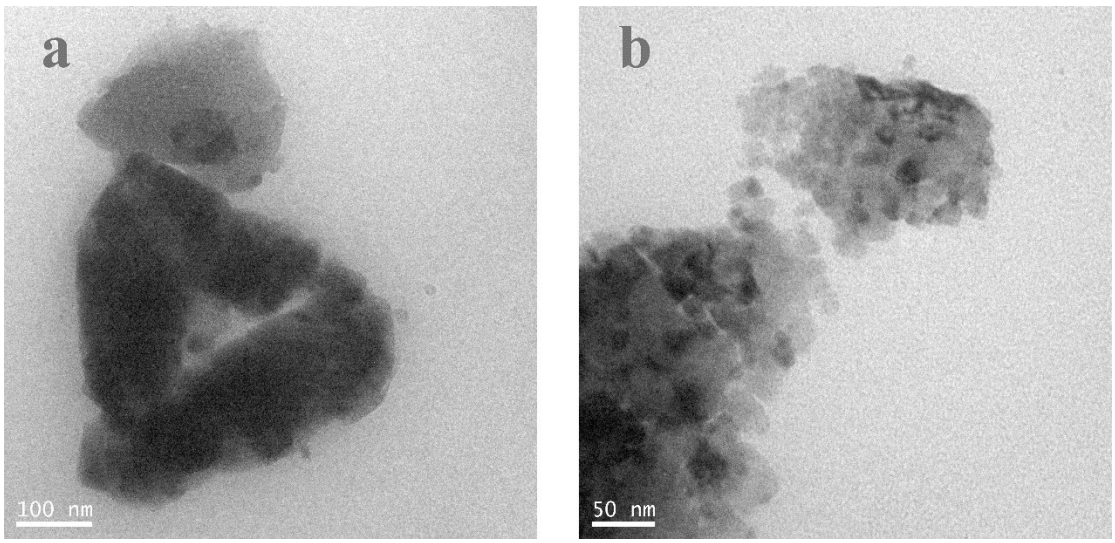

Fig S4 TEM image of $Cs_2Rb_{0.2}Ag_{0.8}In_{0.875}Bi_{0.125}Cl_6$, from which a microcrystalline structure can be analyzed.

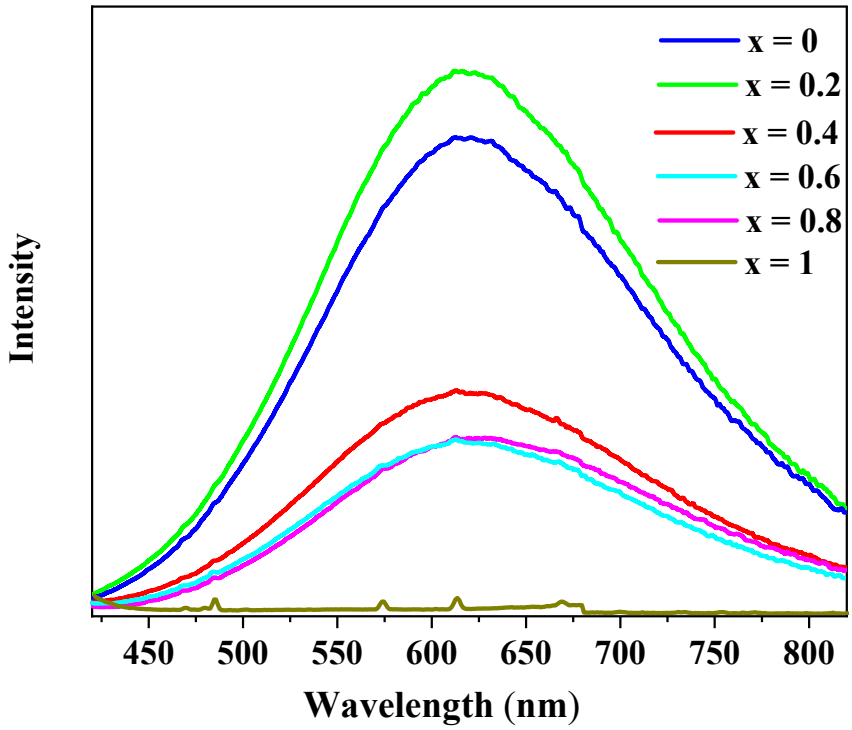

Fig S5 The emission spectra of $Cs_2Rb_xAg_{1-x}$ $In_{0.875}Bi_{0.125}Cl_6$ (x=0, 0.2, 0.4, 0.6, 0.8, 1).

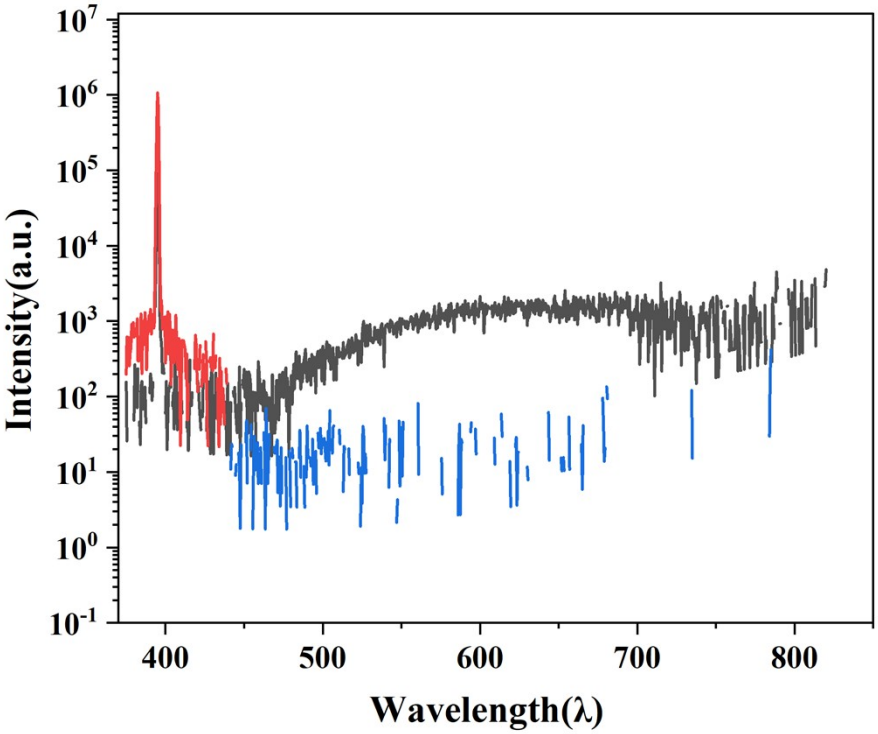

Fig S6 PL for calculation for PLQY ($Cs_2Rb_xAg_{1-x}In_{0.875}Bi_{0.125}Cl_6$, x = 0.15). The red and blue curve represent for the PL background (measured without samples in), and the black curve represent PL for sample.

According to protocol,

$$\text{PLQY} = \frac{E_B - E_A}{S_A - S_B}$$

S_A is the blank spectrum when the vessel is filled Teflon instead of the sample. S_B is the is the peak signal of the remaining excitation source after the sample placed. E_A is the fluorescence background baseline and E_B is emission signal of the sample.

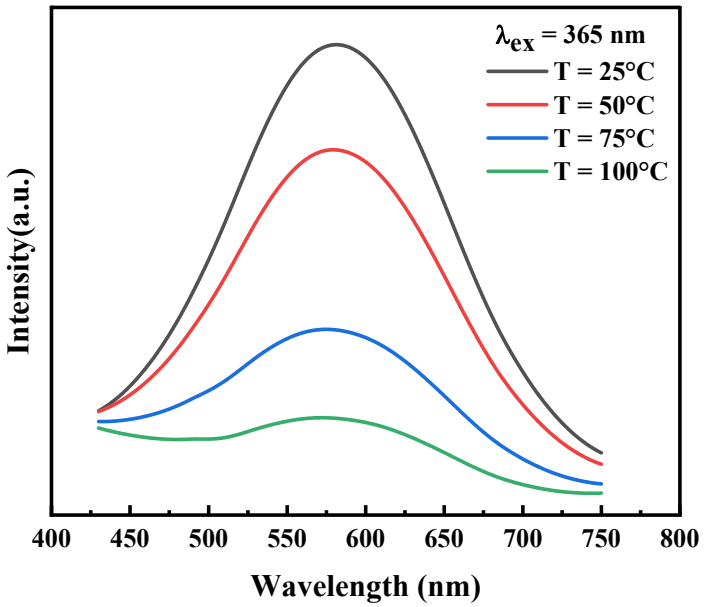

Fig S7 PL for $Cs_2Rb_{0.15}Ag_{0.85}In_{0.875}Bi_{0.125}Cl_6$ under different temperature.

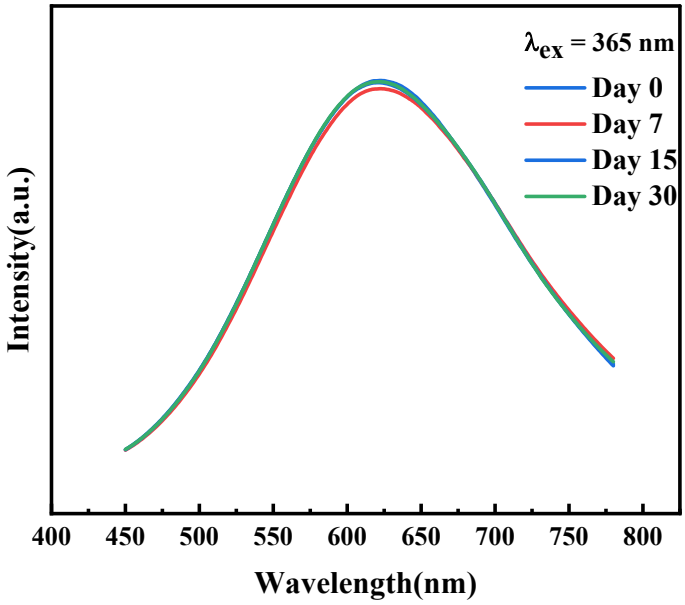

Fig S8 PL spectra for $Cs_2Rb_{0.15}Ag_{0.85}In_{0.875}Bi_{0.125}Cl_6$ after being soaked in ethanol.