Supporting Information

Metal To Metal Charge Transfer Induced Yellow-Green Phosphor $CsAlGe_2O_6$: Bi^{3+} for High Power LED Devices

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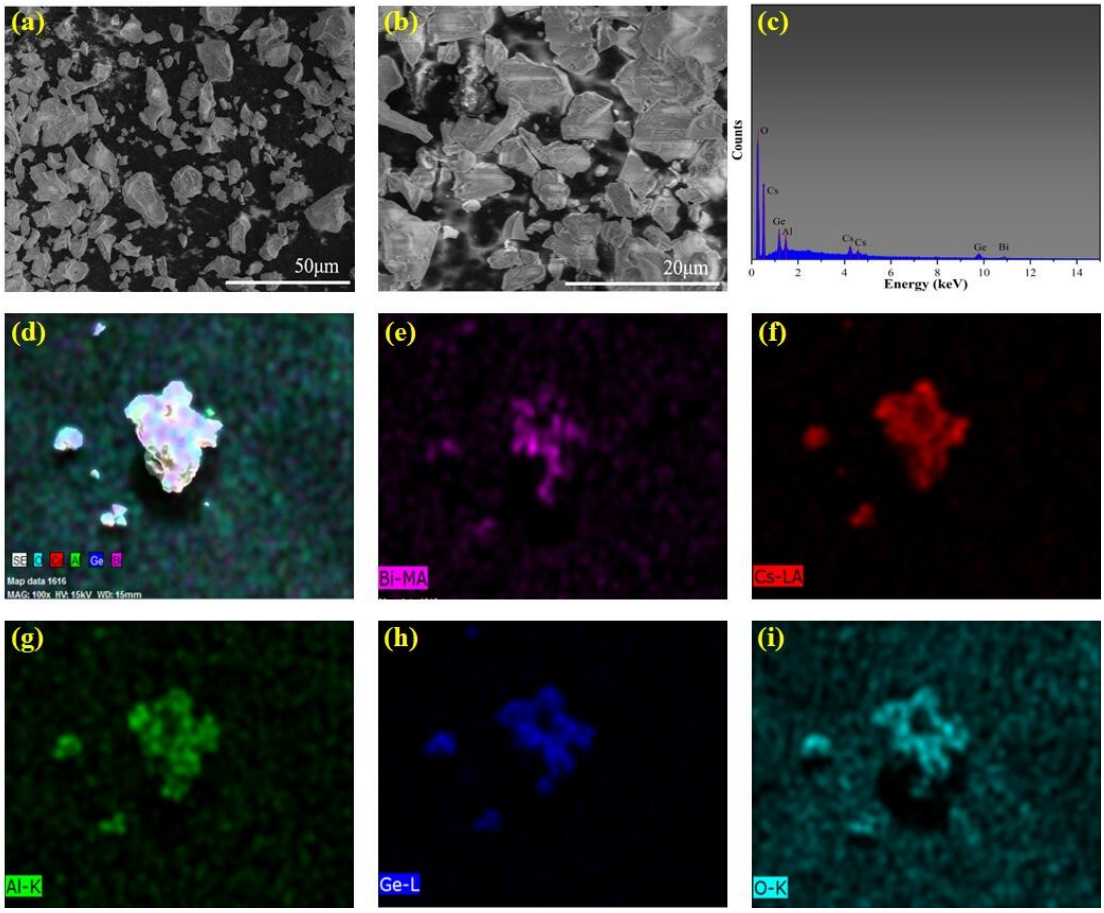

Figure S1. (a) and (b) the SEM spectra of CAGO samples. (c) the EDS spectrum of CAGO: 3%Bi^{3+} phosphor and (d)-(i) distribution diagram of element.

Table S1 Crystal data and structure refinement for $CsAlGe_2O_6$

Source	Cu Kα1 X-rays
Chemical formula	$CsAlGe_2O_6$
Crystal system	Cubic
Space group	I-43d (220)
Cell parameters	a = b = c = 13.904 Å
Cell volume	2688.292 $Å^3$
Z	16

Table S2 Atomic parameters

Atom	Ox.	Wyck.	x/a	y/b	z/c
Ge1	4	48e	0.1271(1)	0.1685(1)	0.4066(1)
Al1	3	48e	0.1271(1)	0.1685(1)	0.4066(1)
O1	-2	48e	0.2380(5)	0.1429(5)	0.3563(6)
O2	-2	48e	0.1194(5)	0.2921(5)	0.4266(4)
Cs1	1	16c	0.1143(1)	0.1143(1)	0.1143(1)

Table S3 Selected bond distances (Å) and angles (deg.) for $CsAlGe_2O_6$

Vector	Length	Angle	Degrees
Ge1/Al1-O1	1.7256	Ge1/Al1-O1-O1	113.081
Ge1/Al1-O1	1.7353	Ge1/Al1-O1-O2	107.614
Ge1/Al1-O2	1.7408	Ge1/Al1-O1-O2	110.047
Ge1/Al1-O2	1.7493	Cs1-O2-O2	105.158
Cs1-O1	3.8109	Cs1-O2-O1	77.489
Cs1-O2	3.6649	Cs1-O2-O1	131.263
Cs1-O2	3.0932	-	-
Cs1-O1	3.5562	-	-

Table S4 The specific CIE color coordinates and color temperature of $CsAlGe_2O_6$: Bi^{3+}

Sample	X	y	CCT (K)
$CsAlGe_2O_6$: 1%Bi^{3+}	0.3339	0.4175	5504
$CsAlGe_2O_6$: 3%Bi^{3+}	0.3508	0.4512	5093
$CsAlGe_2O_6$: 5%Bi^{3+}	0.3600	0.4587	4891
$CsAlGe_2O_6$: 7%Bi^{3+}	0.3638	0.4619	4812
$CsAlGe_2O_6$: 9%Bi^{3+}	0.3722	0.4665	4641
$CsAlGe_2O_6$: 11%Bi^{3+}	0.3756	0.4703	4581