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Supporting Information

A Novel Dy^{3+}-Activated Single-Phase White Light-Emitting Phosphor for Solid-State Lighting

Meng Kuang,[a] Junhao Li,*[ab] Jinjun Zhang,[c] Jianhong Ding,[a] Ziwang Zhang,[b] Kangrong Huang,[d] Nan Yang,[b] Ziheng Zhang,[e] Mingming Yang[a] and Haiyong Ni*[a]

[a] *Guangdong Province Key Laboratory of Rare Earth Development and Application, Institute of Rare Metals, Guangdong Academy of Sciences, Guangzhou 510630, P. R. China*

[b] *School of Chemistry, Sun Yat-Sen University, Guangzhou 510275, P. R. China*

[c] *State Key Laboratory of Green Building Materials, China Building Materials Academy, Beijing 100024, PR China*

[d] *Department of Obstetrical, Maternal and Child Health Hospital of Longgang District of Shenzhen, Shenzhen 518172, P. R. China*

[e] *Materials and Engineering Science Program, Guangdong Technion-Israel Institute of Technology, Shantou 515063, PR China*

* Corresponding authors.

E-mail: lijunhao@irmgdas.gd.cn (J. Li); nhygd@163.com (H. Ni).

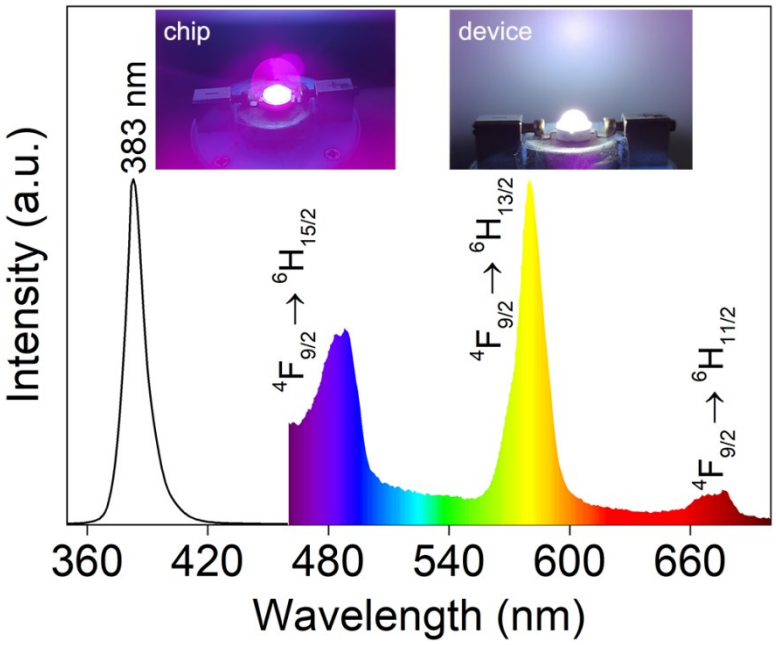

Fig. S1 Electroluminescence spectrum of SCB:0.03Dy^{3+} phosphor-based LED device.

Table S1 The Sc-O and Ca-O bond lengths of SCB:xDy^{3+}

SCB:0.03Dy^{3+}		SCB:0.07Dy^{3+}		SCB:0.11Dy^{3+}	
Sc/Dy-O	Ca-O	Sc/Dy-O	Ca-O	Sc/Dy-O	Ca-O
2.2679 (37)	2.2966 (31)	2.1833 (57)	2.2327 (65)	2.1549 (43)	2.2884 (44)
2.1692 (51)	2.4098 (38)	2.2928 (44)	2.4032 (39)	2.3024 (54)	2.8346 (87)
2.2679 (37)	2.7715 (67)	2.2928 (44)	2.2942 (37)	2.1945 (68)	2.3038 (80)
2.0989 (27)	2.3605 (56)	2.1137 (63)	2.7863 (77)	2.3024 (54)	2.2884 (87)
2.1027 (55)	2.4098 (38)	2.1097 (29)	2.3312 (66)	2.1549 (43)	2.4236 (47)
2.0989 (27)	2.2966 (31)	2.1097 (29)	2.2942 (37)	2.1842 (75)	2.1462 (76)
	2.2527 (56)		2.4032 (39)		2.4236 (47)

Table S2 The refined structure parameters of SCB:0.03Dy^{3+}.

Phosphor	Atom	Wyck.	x/a	y/b	z/c	Occ.	U ($Å^2$)
	Sc(Dy)	4c	0.3883	1.25	0.5725	1.0000	0.018
	Ca	4c	0.5885	3/4	0.8388	1.0000	0.004
	B1	4c	0.3120	1.25	0.8697	1.0000	0.020
SCB:0.03Dy^{3+}	O1	4c	0.5036	3/4	0.6178	1.0000	0.014
	O2	4c	0.2413	1.25	0.7393	1.0000	0.003
	O3	4c	0.2595	3/4	0.4916	1.0000	0.019
	O4	4c	0.4379	1/4	0.8682	1.0000	0.020

Space group: Pnma (62) - orthorhombic.

Cell parameters: a = 10.1820 Å, b = 3.3742 Å, c = 9.4137 Å.

V = 323.41 $Å^3$, Z = 4.

Reliability factors: R_p = 6.80%, wR_p = 8.97%.

Table S3 The refined structure parameters of SCB:0.07Dy^{3+}.

Phosphor	Atom	Wyck.	x/a	y/b	z/c	Occ.	U ($Å^2$)
	Sc(Dy)	4c	0.3891	1.25	0.5731	1.000	0.025
	Ca	4c	0.5886	3/4	0.8394	1.000	0.001
	B1	4c	0.3103	1.25	0.8716	1.000	0.026
SCB:0.07Dy^{3+}	O1	4c	0.5052	3/4	0.6201	1.000	0.024
	O2	4c	0.2397	1.25	0.7395	1.000	0.005
	O3	4c	0.2566	3/4	0.4923	1.000	0.030
	O4	4c	0.4383	1/4	0.8661	1.000	0.034.

Space group: Pnma (62) - orthorhombic.

Cell parameters: a = 10.1801 Å, b = 3.3812 Å, c = 9.4154 Å.

V = 324.09 $Å^3$, Z = 4.

Reliability factors: R_p = 6.33%, wR_p = 8.04%.

Table S4 The refined structure parameters of SCB:0.11Dy^{3+}.

Phosphor	Atom	Wyck.	x/a	y/b	z/c	Occ.	U ($Å^2$)
SCB:0.11Dy^{3+}	Sc(Dy)	4c	0.3880	1.25	0.5735	1.000	0.032
	Ca	4c	0.5877	3/4	0.8404	1.000	-0.002
	B1	4c	0.3178	1.25	0.8830	1.000	0.018
	O1	4c	0.5082	3/4	0.6294	1.000	0.049
	O2	4c	0.2397	3/4	0.4937	1.000	0.008
	O3	4c	0.2538	3/4	0.4937	1.000	0.035
	O4	4c	0.4377	1/4	0.8599	1.000	0.038

Space group: Pnma (62) - orthorhombic.

Cell parameters: a = 10.1923 Å, b = 3.3856 Å, c = 9.4187 Å.

V = 325.01 $Å^3$, Z = 4.

Reliability factors: R_p = 5.97%, wR_p = 8.06%.