Electronic Supplementary Information (ESI) for:

Unusual broad red emission of novel Ce^{3+}-activated $Sr_3Sc_4O_9$ phosphors under visible-light excitation

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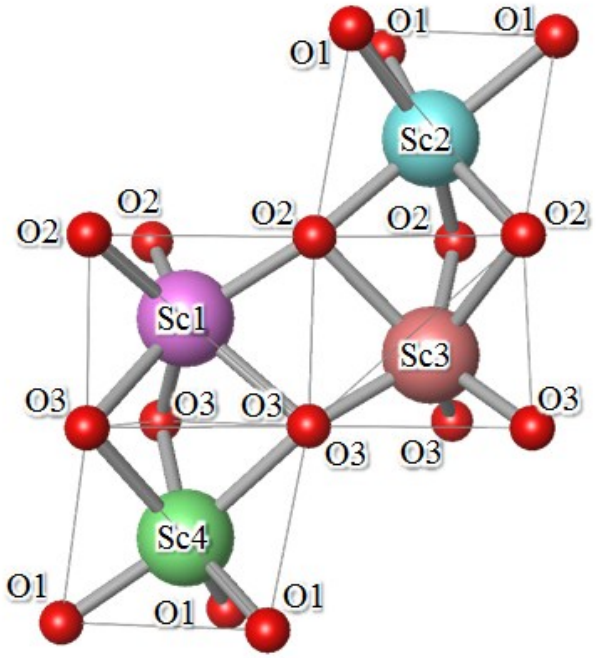
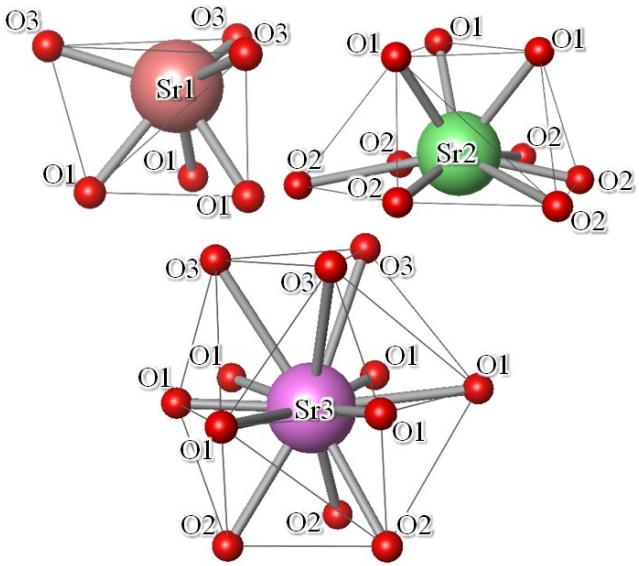


Sc atoms	O atoms	Bond distances (nm)
Sc1	O2	0.206894(2) ×3
	O3	0.222915(2) ×3
Sc2	O1	0.214523(2) ×3
	O2	0.209473(2) ×3
Sc3	O2	0.225313(2) ×3
	O3	0.195149(2) ×3
Sc4	O1	0.199950(2) ×3
	O3	0.228608(2) ×3

Figure S1 Coordination environmental and Bond distances of ScnO$_6$ (n = 1~4) polyhedra in the $Sr_3Sc_4O_9$.



Sr atoms	O atoms	Bond distances (nm)
Sr1	O1	0.252114(2) ×3
	O3	0.246737(3) ×3
Sr2	O1	0.268115(2) ×3
	O2	0.250909(3) ×3
	O2	0.329507(4) ×3
Sr3	O1	0.253189(3) ×3
	O1	0.317049(4) ×3
	O2	0.302539(3) ×3
	O3	0.330995(3) ×3

Figure S2 Coordination environmental and Bond distances of SrnO$_x$ (n = 1~3, x = 6, 9 and 12) polyhedra in the $Sr_3Sc_4O_9$.

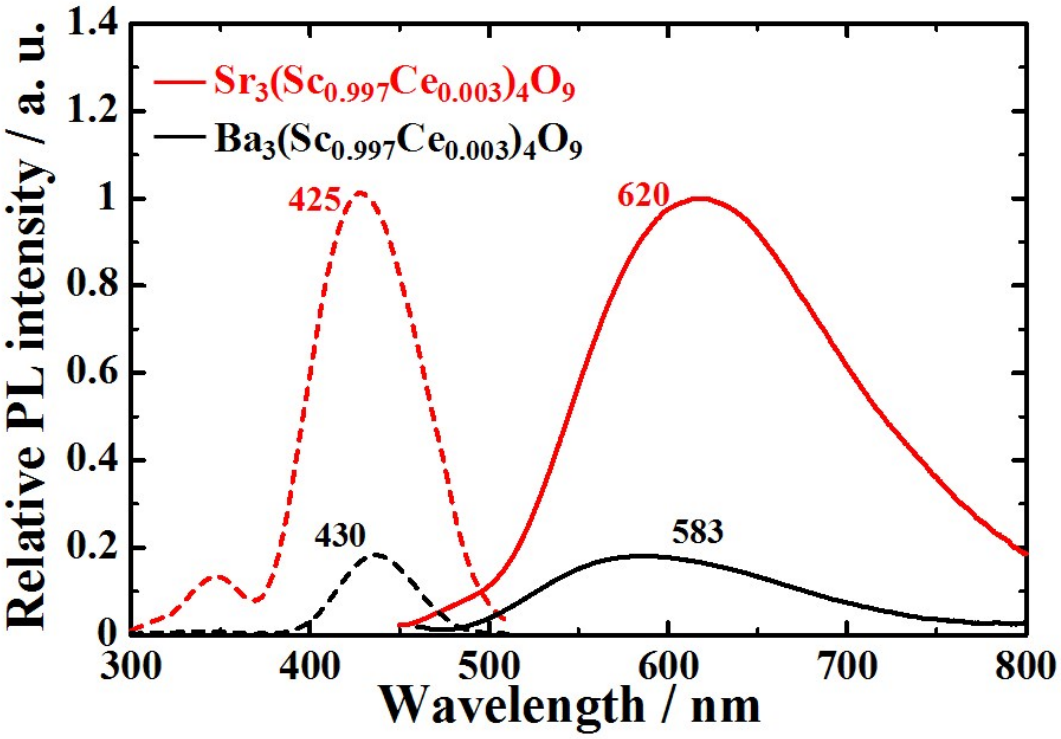


Figure S3 Excitation (dotted line) and emission (solid line) spectra of the $Sr_3(Sc_{0.997}Ce_{0.003})_4O_9$ (red) and $Ba_3(Sc_{0.997}Ce_{0.003})_4O_9$ (black) phosphors. The excitation and emission spectra were recorded at maximum peak wavelength for each sample.

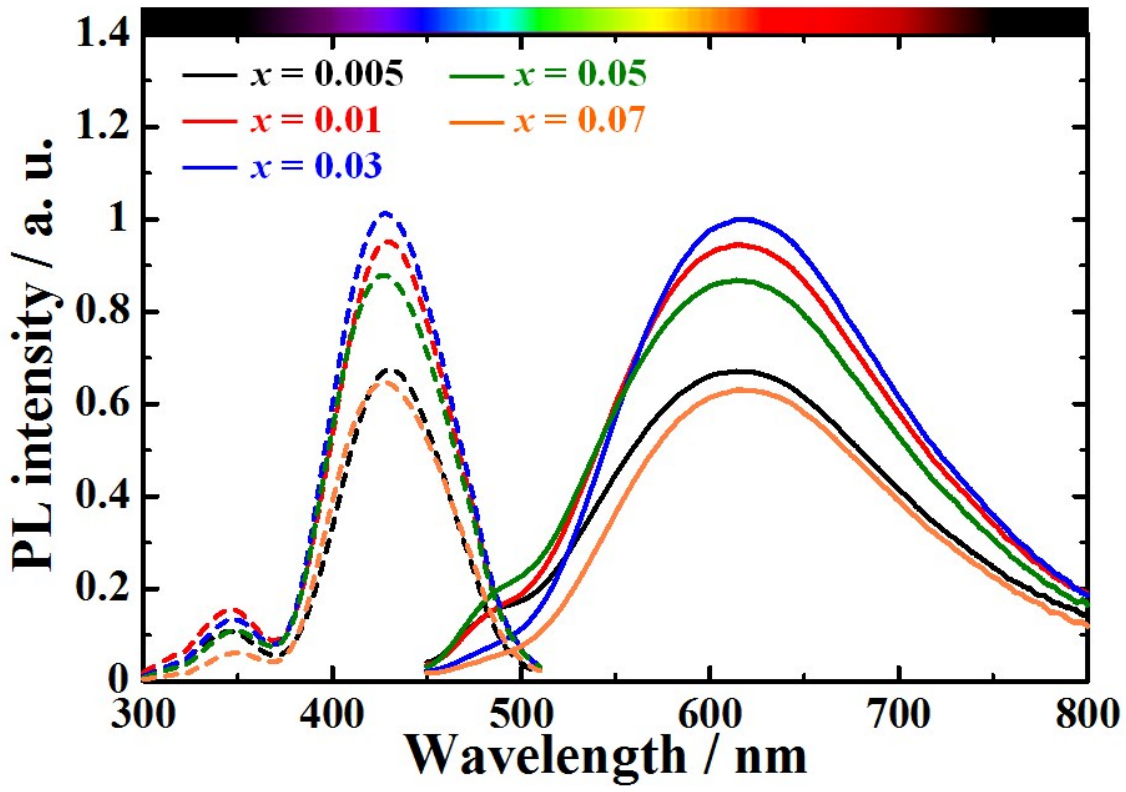


Figure S4 Photoluminescence excitation (dotted line) and emission spectra (solid line) of $Sr_3(Sc_{1-x}Ce_x)_4O_9$ phosphors various Ce^{3+} concentrations ($0.0005 \leq x \leq 0.007$). The excitation and emission spectra were recorded at maximum peak wavelength for each sample.