

Supporting Information

Figure.S1 Calcium environments and bond length in CASO (Wyck.:

4i)

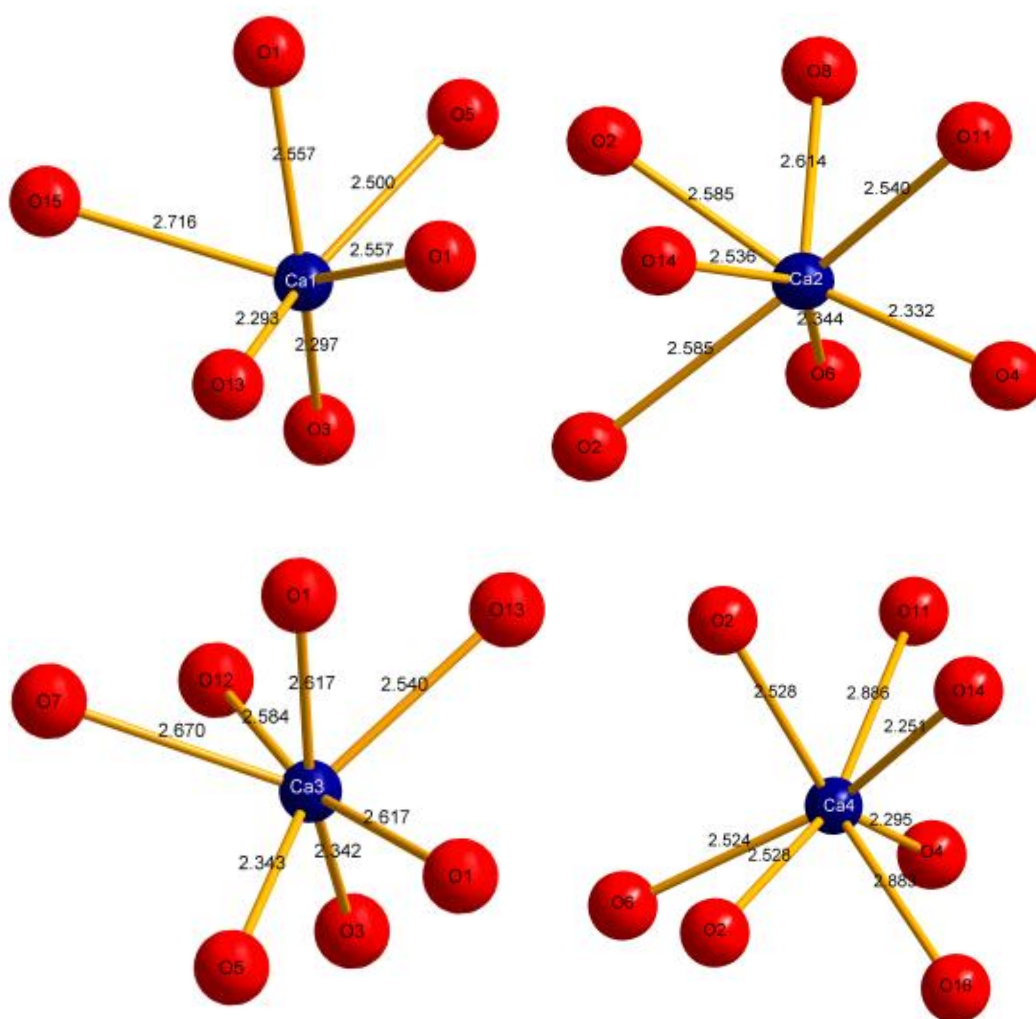


Figure.S2 Evolution of the cell parameters of $\text{Ca}_{1-x}\text{Eu}_x\text{ASO}$ with $x =$
0 to 70%

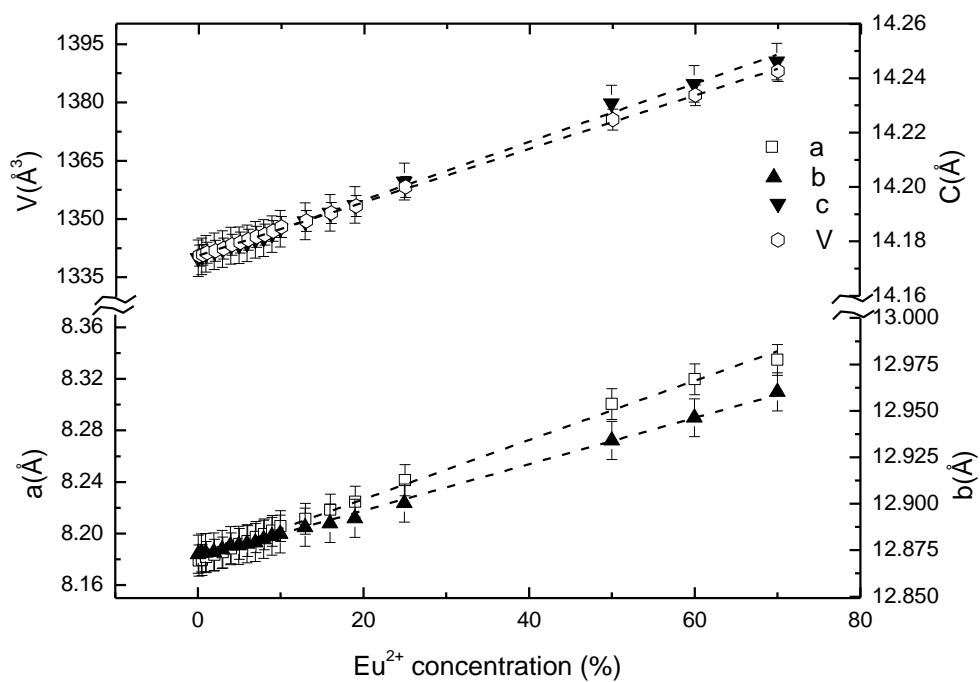


Figure.S3 Excitation spectra of the $C_{1-x}Eu_xASO$ ($x = 0.1\%$, 4% and 7%) monitored at 611 nm , inset is the enlarger spectra between the wavelength 390 and 480 nm

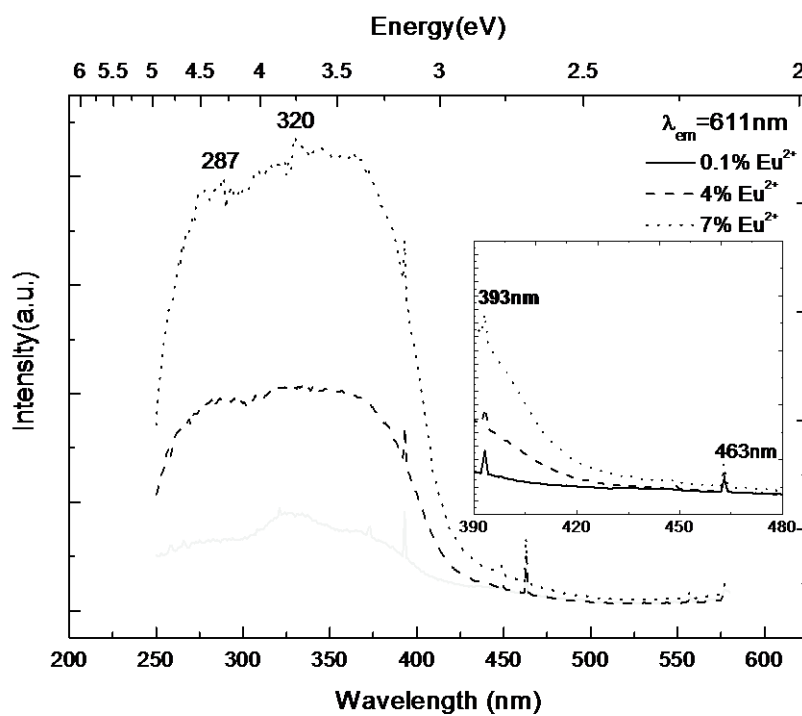


Figure.S4 The PLE and PL spectra of Eu^{2+} in $\text{C}_{1-3x/2}\text{ASO}: x\text{Eu}$
synthesized in air ($x = 0.5\%$ to 13%)

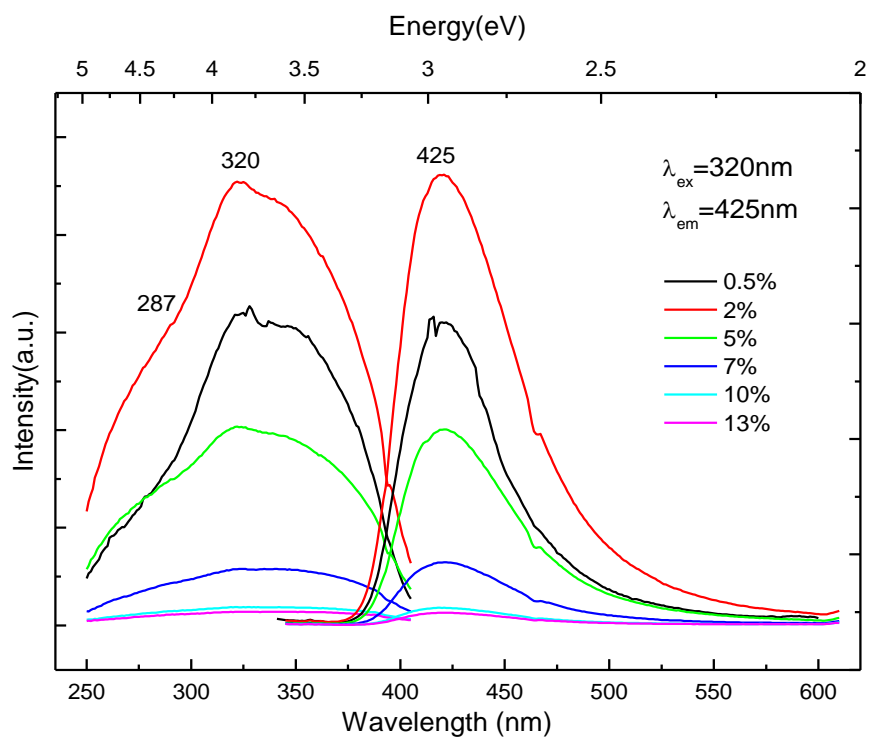


Figure.S5 A schematic diagram of the induced luminescence from CASO resulting from radiative ET from Eu^{2+} to Eu^{3+}

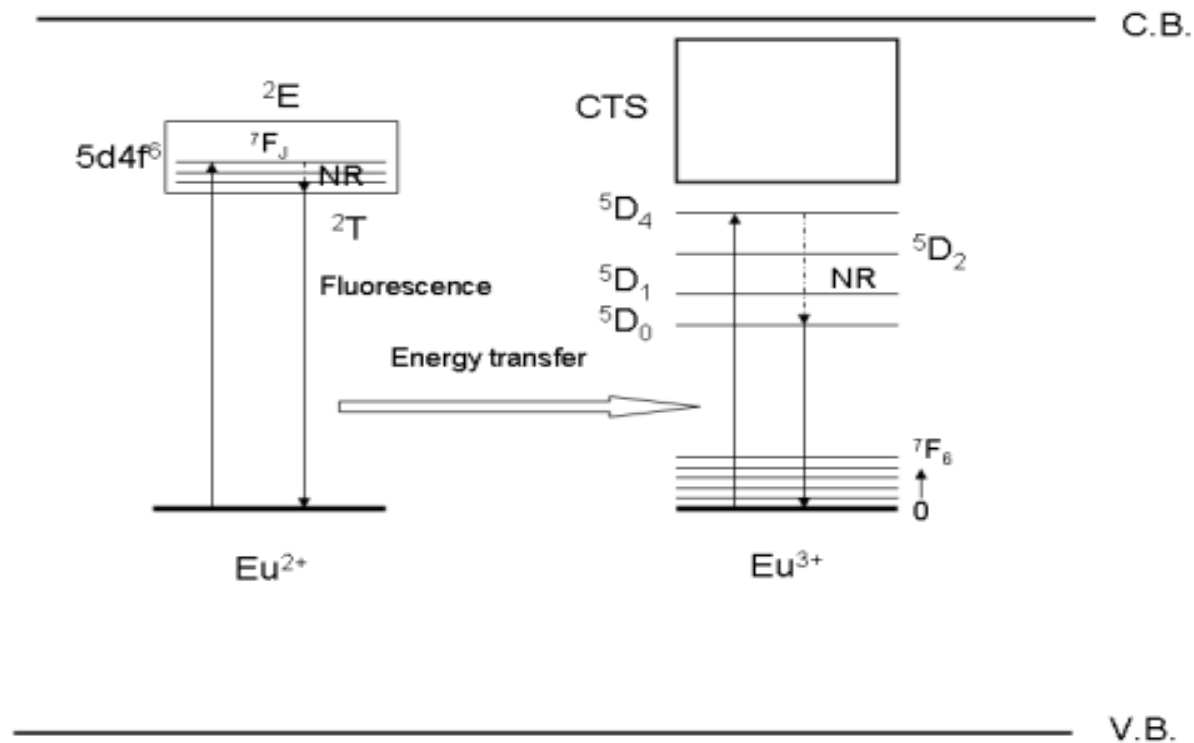


Figure.S6 Excitation spectra $C_{1-3x/2}ASO:xEu^{3+}$ ($x = 5\%$) of the A (Eu^{3+}) emission (monitored at $\lambda_{em} = 611$ nm, solid line), which include the S (Eu^{2+}) absorption (located at ~ 320 nm) and A absorption bands. The dotted line (excitation spectra monitored at $\lambda_{em} = 425$ nm of the sample $C_{1-x}Eu_xASO$, $x = 1\%$) and dashed line (excitation spectra monitored at $\lambda_{em} = 611$ nm of the same sample $C_{1-x}Eu_xASO$, $x = 1\%$) are also shown for comparison

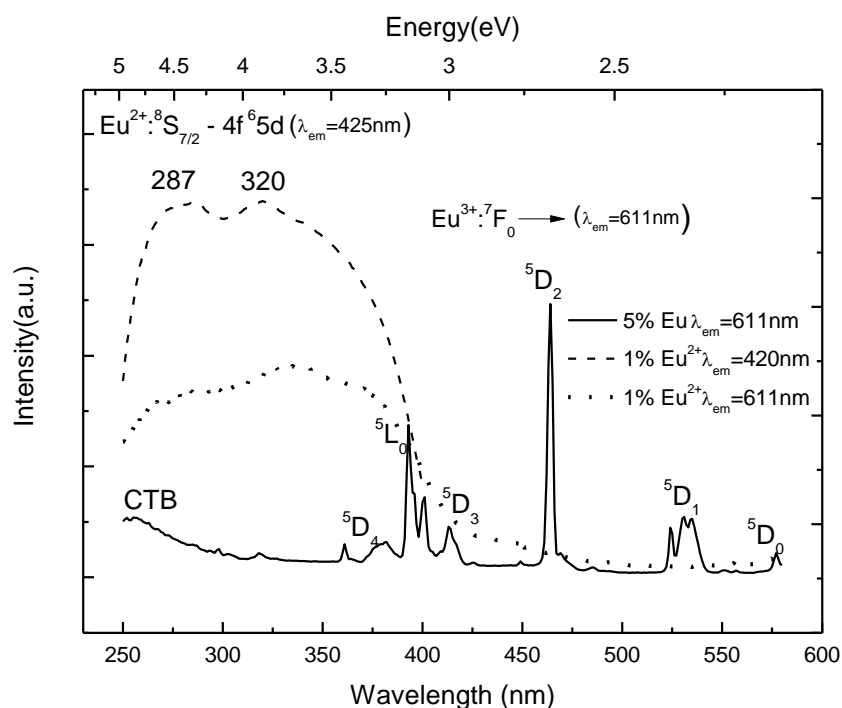


Figure.S7 $4f^65d^1$ emission decay curves acquired at room temperature for $C_{1-3x/2}Eu_xASO$ and $C_{1-x}Eu_xASO_{8+0.5x}$ ($x = 0.5\%$ to 13%), monitored the emission at 420 nm and with excitation at 400 nm (data collected on $I = I_0\exp(-t/\tau)$)

