Supporting information

STRUCTURAL AND OPTICAL CHARACTERIZATION OF Er-DOPED $CaMoO_4$ DOWN-CONVERTING PHOSPHORS

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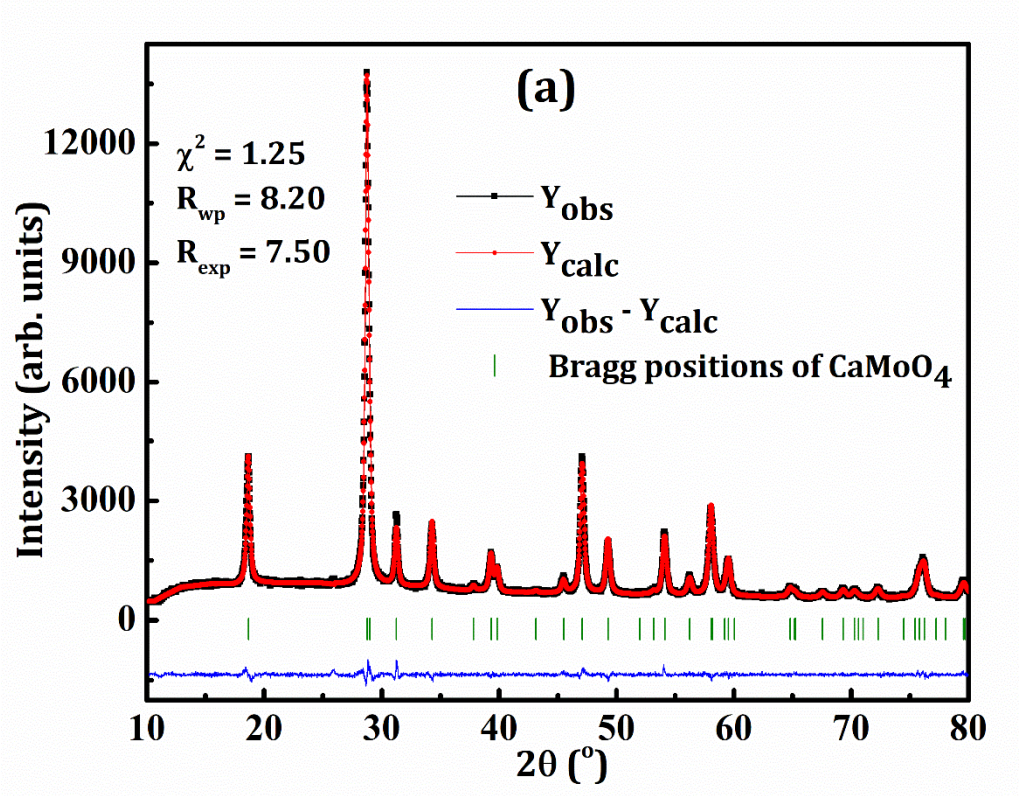
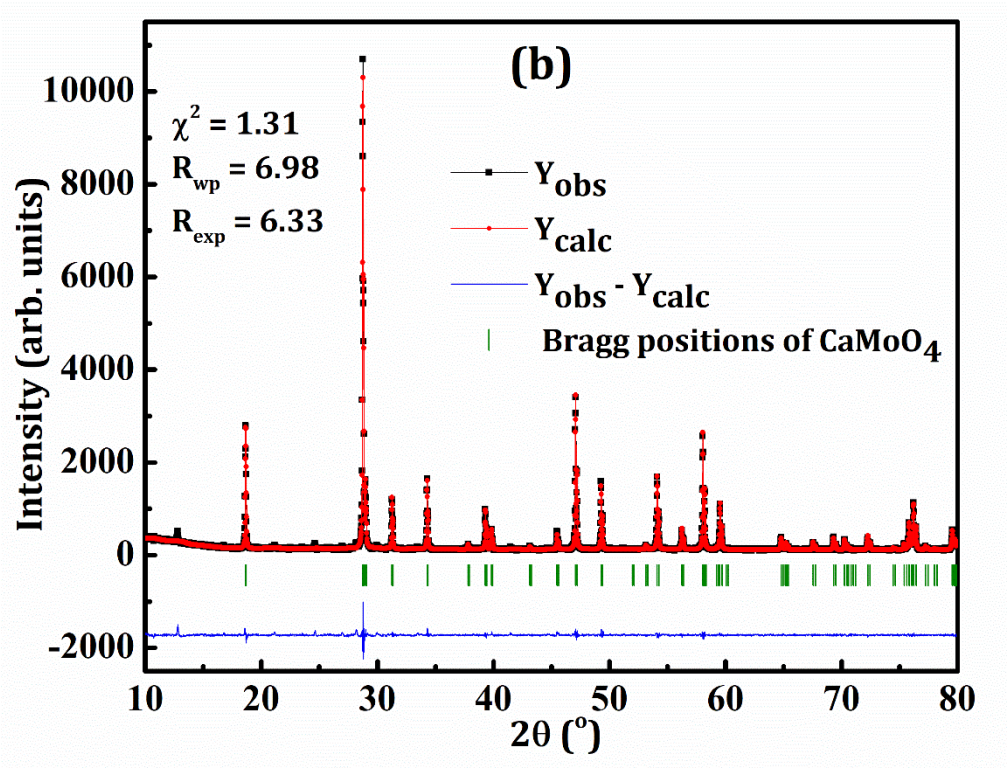
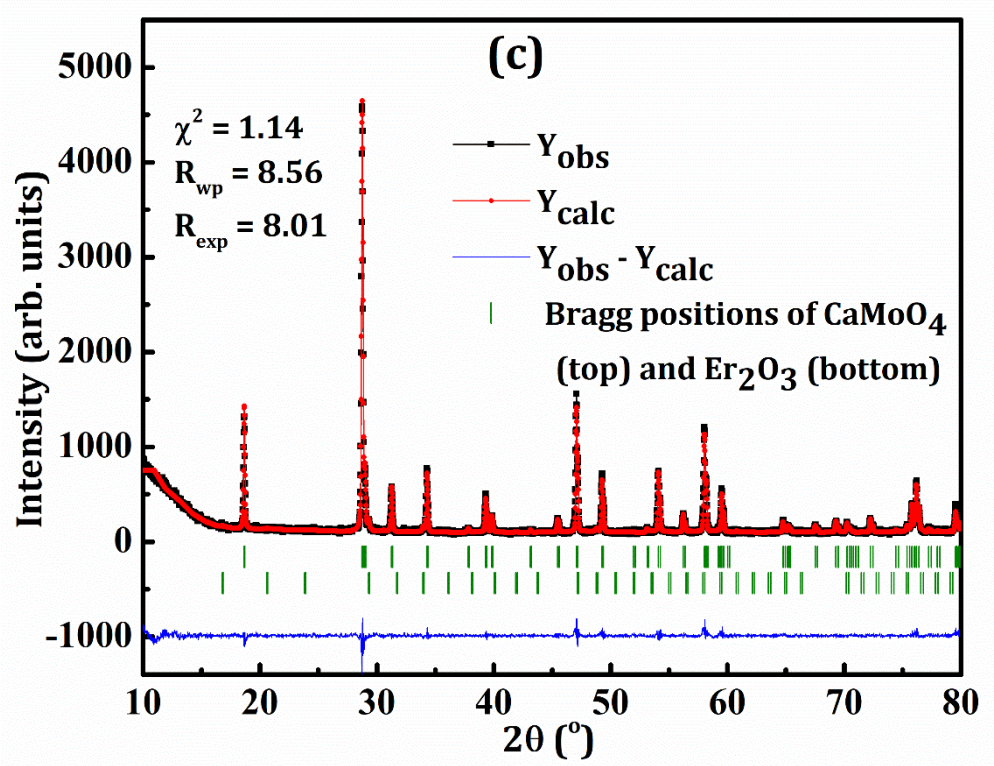
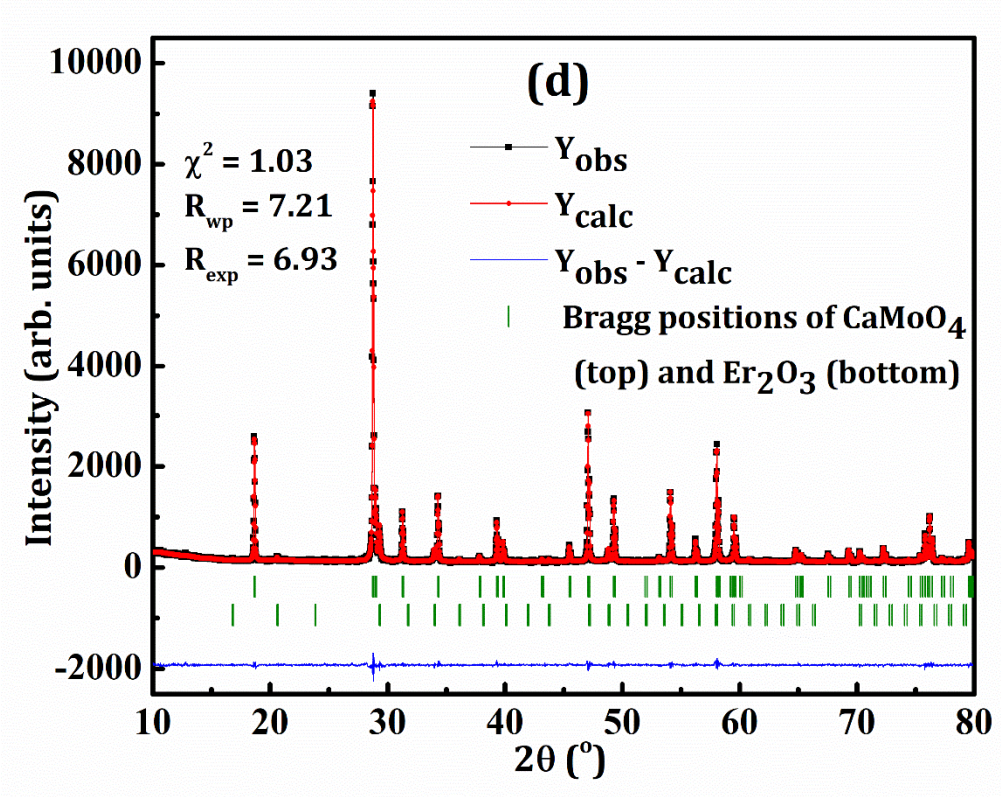
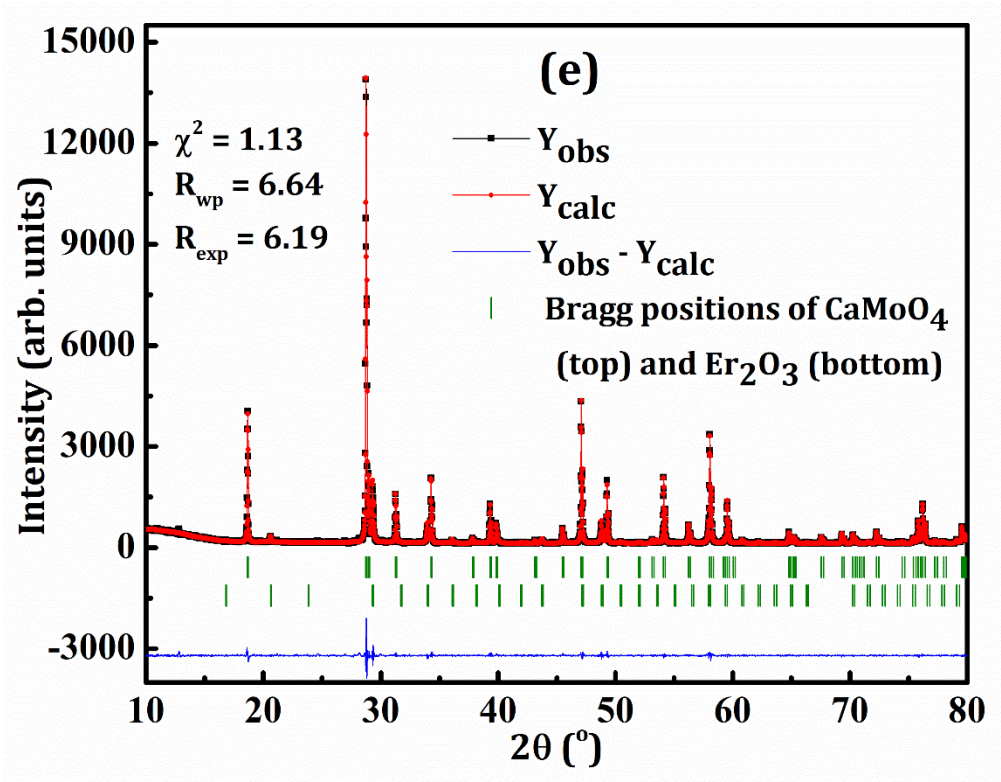
S1. Rietveld Refinement




(b)
χ^2 = 1.31
R_{wp} = 6.98
R_{exp} = 6.33
Y_{obs}
Y_{calc}
Y_{obs} - Y_{calc}
Bragg positions of $CaMoO_4$
Intensity (arb. units)
2θ (°)


(c)
χ^2 = 1.14
R_{wp} = 8.56
R_{exp} = 8.01
Y_{obs}
Y_{calc}
Y_{obs} - Y_{calc}
Bragg positions of $CaMoO_4$
(top) and Er_2O_3 (bottom)
Intensity (arb. units)
2θ (°)


(d)
χ^2 = 1.03
R_{wp} = 7.21
R_{exp} = 6.93
Y_{obs}
Y_{calc}
Y_{obs} - Y_{calc}
Bragg positions of $CaMoO_4$
(top) and Er_2O_3 (bottom)
Intensity (arb. units)
2θ (°)


(e)
χ^2 = 1.13
R_{wp} = 6.64
R_{exp} = 6.19
Y_{obs}
Y_{calc}
Y_{obs} - Y_{calc}
Bragg positions of $CaMoO_4$
(top) and Er_2O_3 (bottom)
Intensity (arb. units)
2θ (°)

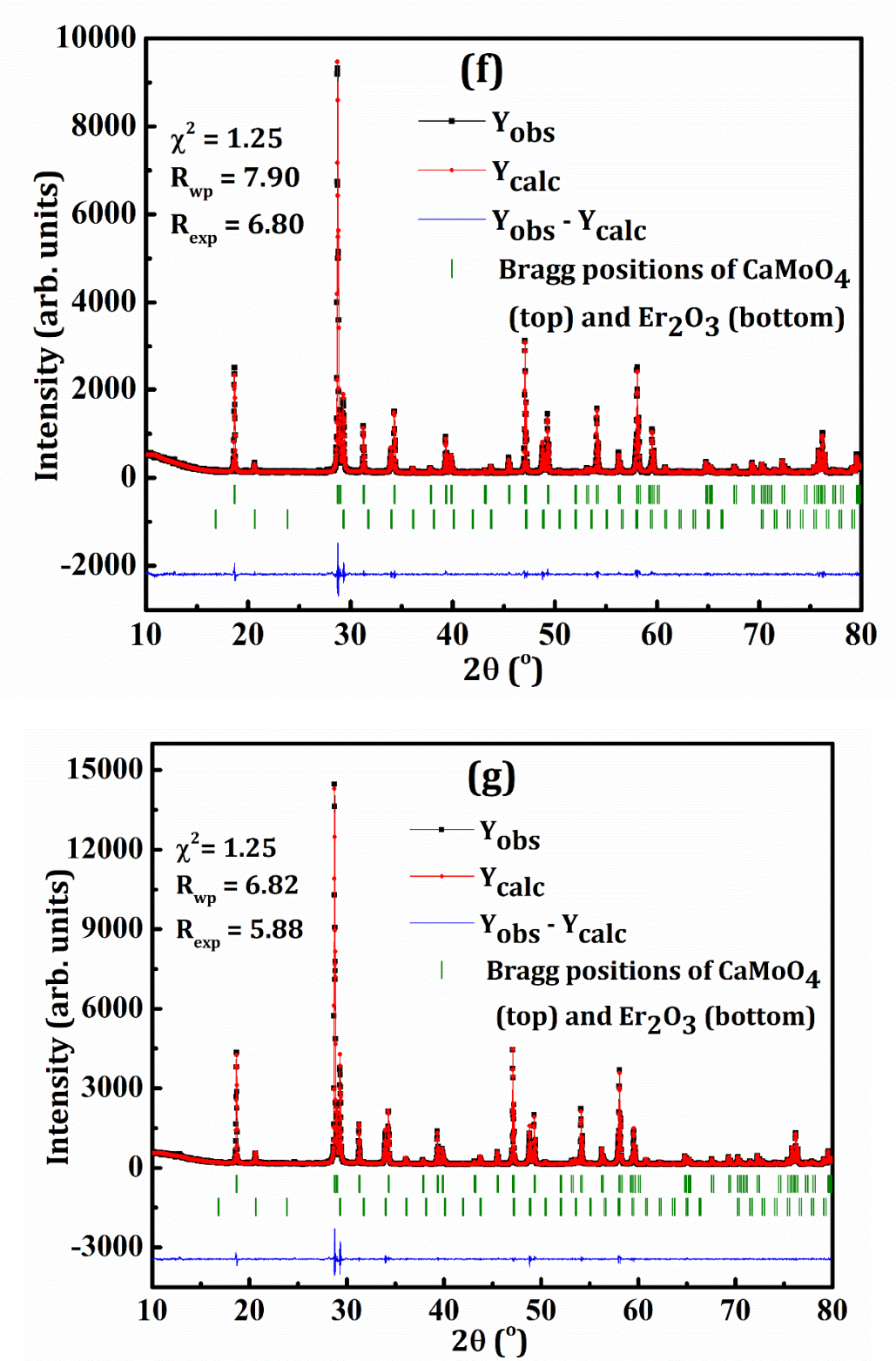


Figure S1 Rietveld refinement plots of (a) CM-80 (b) CM-800 (c) 1Er-CM (d) 3Er-CM (e) 5Er-CM (f) 7Er-CM and (g) 10Er-CM.

Table S1 Fractional atomic position co-ordinates of Ca, Mo and O ions in phase 1: tetragonal $CaMoO_4$.

Atom		CM-80	CM-800	1Er-CM	3Er-CM	5Er-CM	7Er-CM	10Er-CM
Ca	x	0	0	0	0	0	0	0
	y	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	z	0.625	0.625	0.625	0.625	0.625	0.625	0.625
Mo	x	0	0	0	0	0	0	0
	y	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	z	0.125	0.125	0.125	0.125	0.125	0.125	0.125
O	x	0.150±0.001	0.149±0.001	0.151±0.001	0.148±0.001	0.148±0.001	0.148±0.001	0.148±0.001
	y	0.004±0.001	0.001±0.001	0.002±0.001	0.001±0.001	0.003±0.001	0.002±0.001	0.004±0.001
	z	0.206±0.001	0.210±0.001	0.210±0.001	0.211±0.001	0.210±0.001	0.210±0.001	0.210±0.001

Table S2 Fractional atomic position co-ordinates of Er1, Er2 and O atoms in phase 2: cubic Er_2O_3.

Atom		1Er-CM	3Er-CM	5Er-CM	7Er-CM	10Er-CM
Er1	x	0.25	0.25	0.25	0.25	0.25
	y	0.25	0.25	0.25	0.25	0.25
	z	0.25	0.25	0.25	0.25	0.25
Er2	x	-0.012±0.005	-0.028±0.001	-0.032±0.001	-0.031 ± 0.001	-0.032 ± 0.001
	y	0	0	0	0	0
	z	0.25	0.25	0.25	0.25	0.25
O	x	0.392±0.069	0.386±0.003	0.395±0.001	0.389 ± 0.003	0.396 ± 0.001
	y	0.170±0.012	0.163±0.001	0.152±0.001	0.154 ± 0.004	0.150 ± 0.002
	z	0.276±0.098	0.334±0.001	0.376±0.001	0.375 ± 0.012	0.381 ± 0.002

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S2. Raman spectroscopy

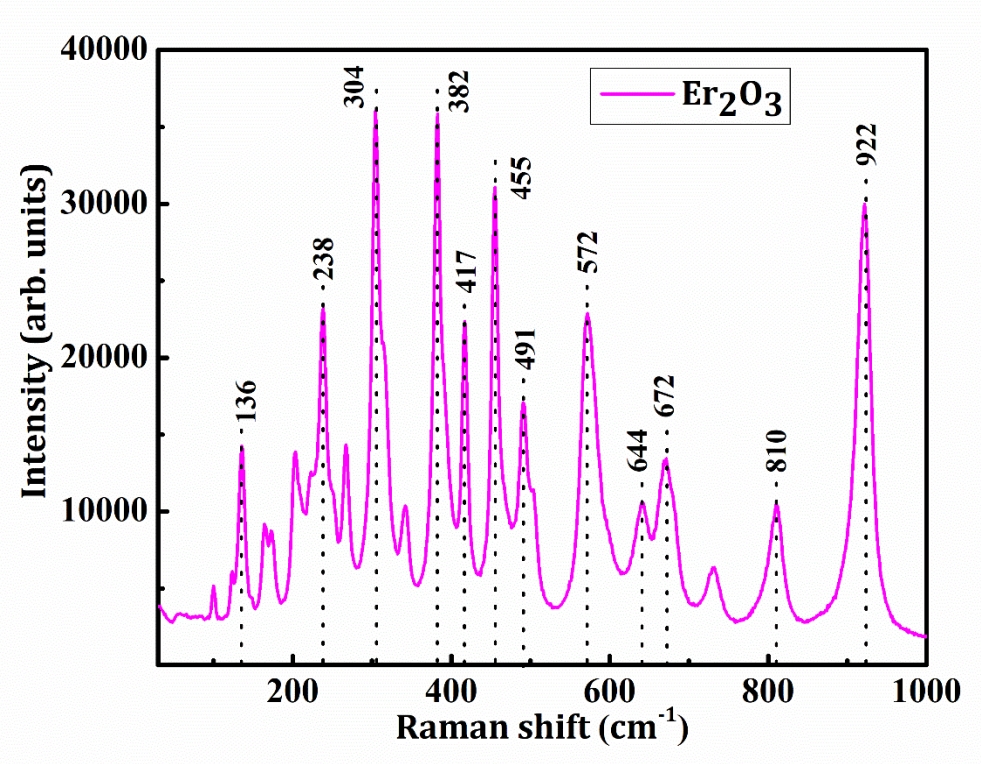

Figure S2. Raman pattern of Er_2O_3 powder sample.