

Electronic Supplementary Information (ESI) for New Journal of Chemistry:

**Energy transfer dynamics and time resolved photoluminescence in
BaWO₄:Eu³⁺ nanophosphors synthesized by mechanical activation**

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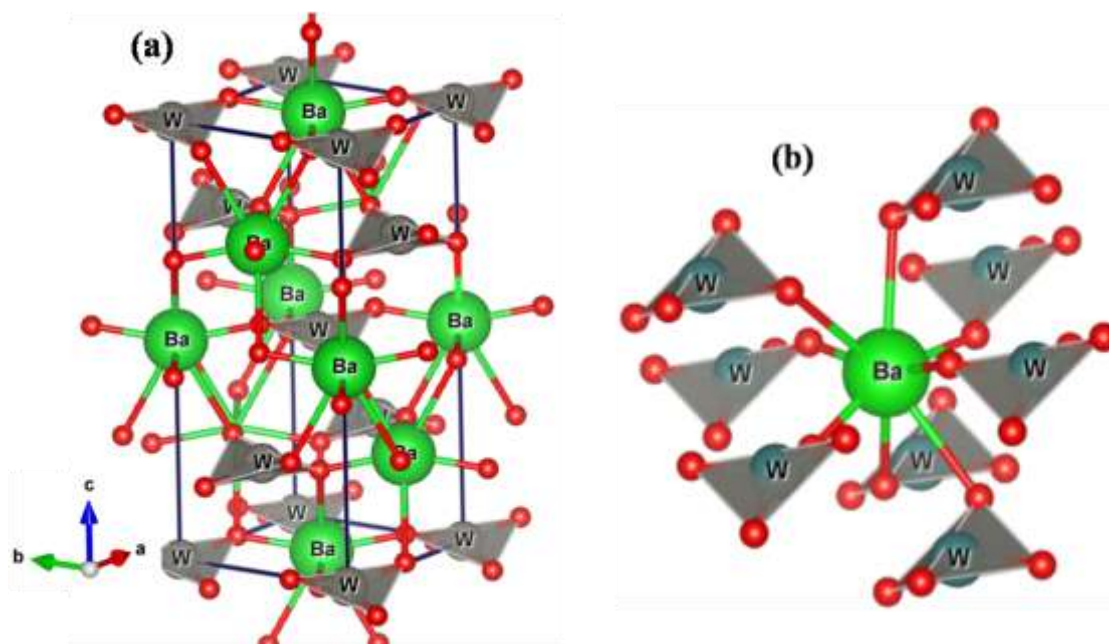


Figure S1 (a) Schematic representation of (a) Scheelite type tetragonal unit cell of BaWO₄ and (b) Ba site coordination environment in [BaO₈] cluster.

Table A Refined structural parameters of the pure and various compositions of BaWO₄:Eu³⁺ samples obtained from Rietveld analysis.

BWO					
Atom	X	Y	Z	Biso.	Occup.
Ba/Eu	0.00	0.2500	0.62500	0.084(1)	1/0
W	0.00	0.2500	0.12500	2.515(1)	1
O	0.253(2)	0.1134 (2)	0.0899 (8)	0.00	4
BEW 0.1 mol%					
Ba	0.00	0.250	0.625	0.00	0.999
Eu	0.00	0.250	0.125	1.931 (2)	0.001
W	0.00	0.250	0.125	1.931 (2)	1
O	0.249 (2)	0.112 (2)	0.095(8)	0.00	4.0005
BEW 0.5 mol%					
Ba	0.00	0.250	0.625	1.042(1)	0.995
Eu	0.00	0.250	0.125	0.970(8)	0.005
W	0.00	0.250	0.125	0.970(8)	1
O	0.248(2)	0.113(2)	0.077(8)	1.274(5)	4.0025
BEW 1 mol%					
Ba	0.00	0.250	0.625	0.709(1)	0.990
Eu	0.00	0.250	0.125	1.126(9)	0.010
W	0.00	0.250	0.125	1.126(9)	1
O	0.2504(2)	0.11004(2)	0.0801(8)	0.868(5)	4.005
BEW 2 mol%					
Ba	0.00	0.250	0.625	0.00	0.980
Eu	0.00	0.250	0.125	2.436(1)	0.020
W	0.00	0.250	0.125	2.436(1)	1
O	0.258(2)	0.10994(2)	0.10167(1)	0.00	4.01
BEW 5 mol%					
Ba	0.00	0.250	0.625	0.00	0.95
Eu	0.00	0.250	0.125	3.063(1)	0.05
W	0.00	0.250	0.125	2.184(1)	1
O	0.271(2)	0.1004(2)	0.09703(1)	1.201(5)	4.025

Table B Band positions of the Raman active modes (cm^{-1}) of pure and $\text{BaWO}_4:\text{Eu}^{3+}$ samples obtained from the present work (Fig.5) along with the reported literature results.

Raman active modes (cm^{-1})	Present work BaWO_4 & Eu^{3+} doped BaWO_4 calcined at $1100\text{ }^\circ\text{C}$ (cm^{-1})	Band positions in cm^{-1}			
		14	44	45	46
$\nu_1 (\text{A}_g)$	926	924	925	926	920.3
$\nu_3 (\text{B}_g)$	831	830	831	831	829
$\nu_3 (\text{E}_g)$	794	793	795	795	790
$\nu_4 (\text{E}_g)$	354	354	353	352	-
$\nu_4 (\text{B}_g)$	344	344	345	344	-
$\nu_2 (\text{A}_g/\text{B}_g)$	332	330/332	332	331/332	330
R (E_g)	191	190	191	191	188
R (A_g)	152	150	150	150	-
T (B_g)	135	132	132	133	-
T (E_g)	102	101	101	101	98
T (B_g)	74	74	75	74	72
T (E_g)	62	62	63	63	60

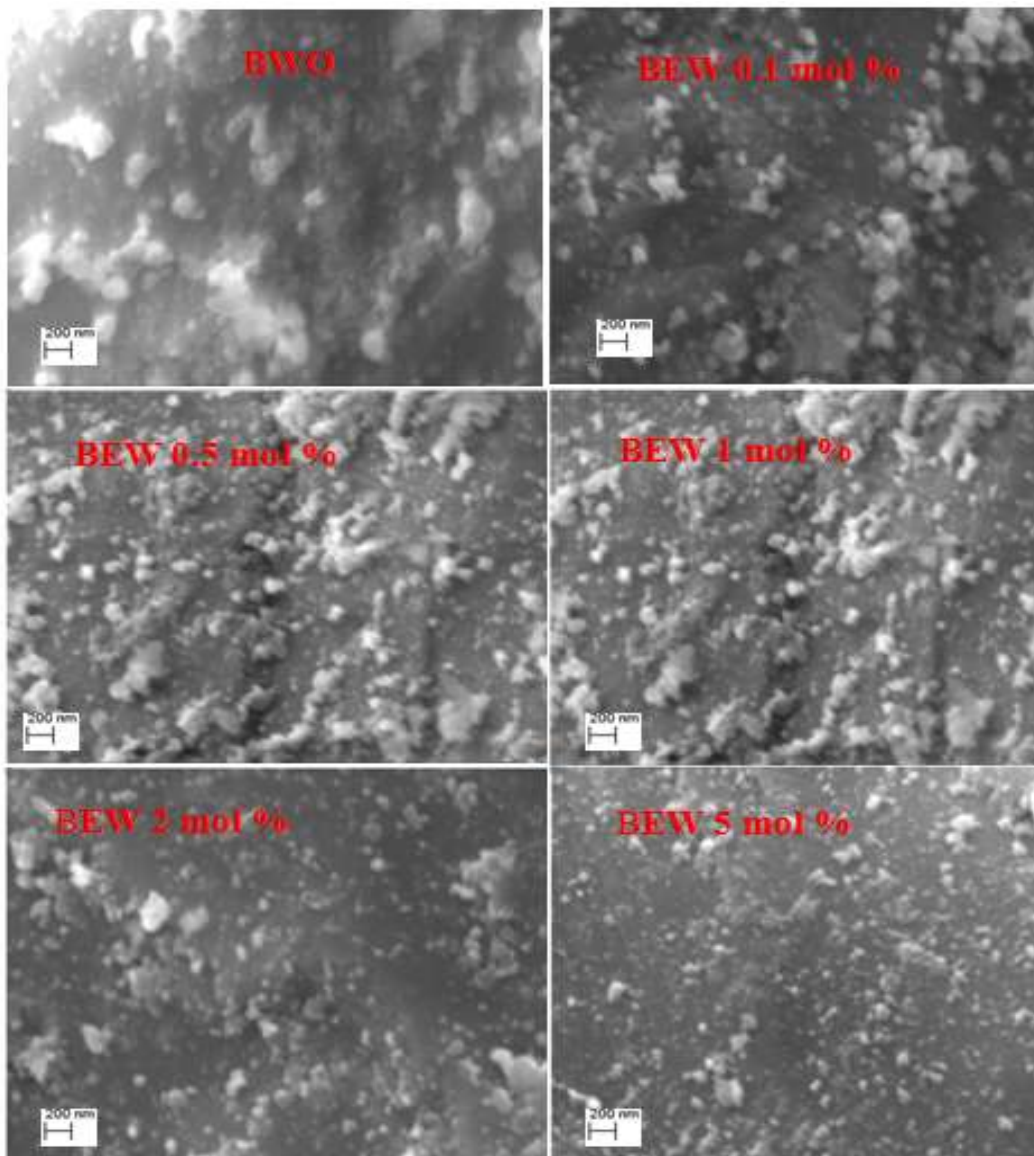


Figure S2 SEM images of the pure and various compositions of $\text{BaWO}_4:\text{Eu}^{3+}$ samples calcined at $1100\text{ }^\circ\text{C}$.

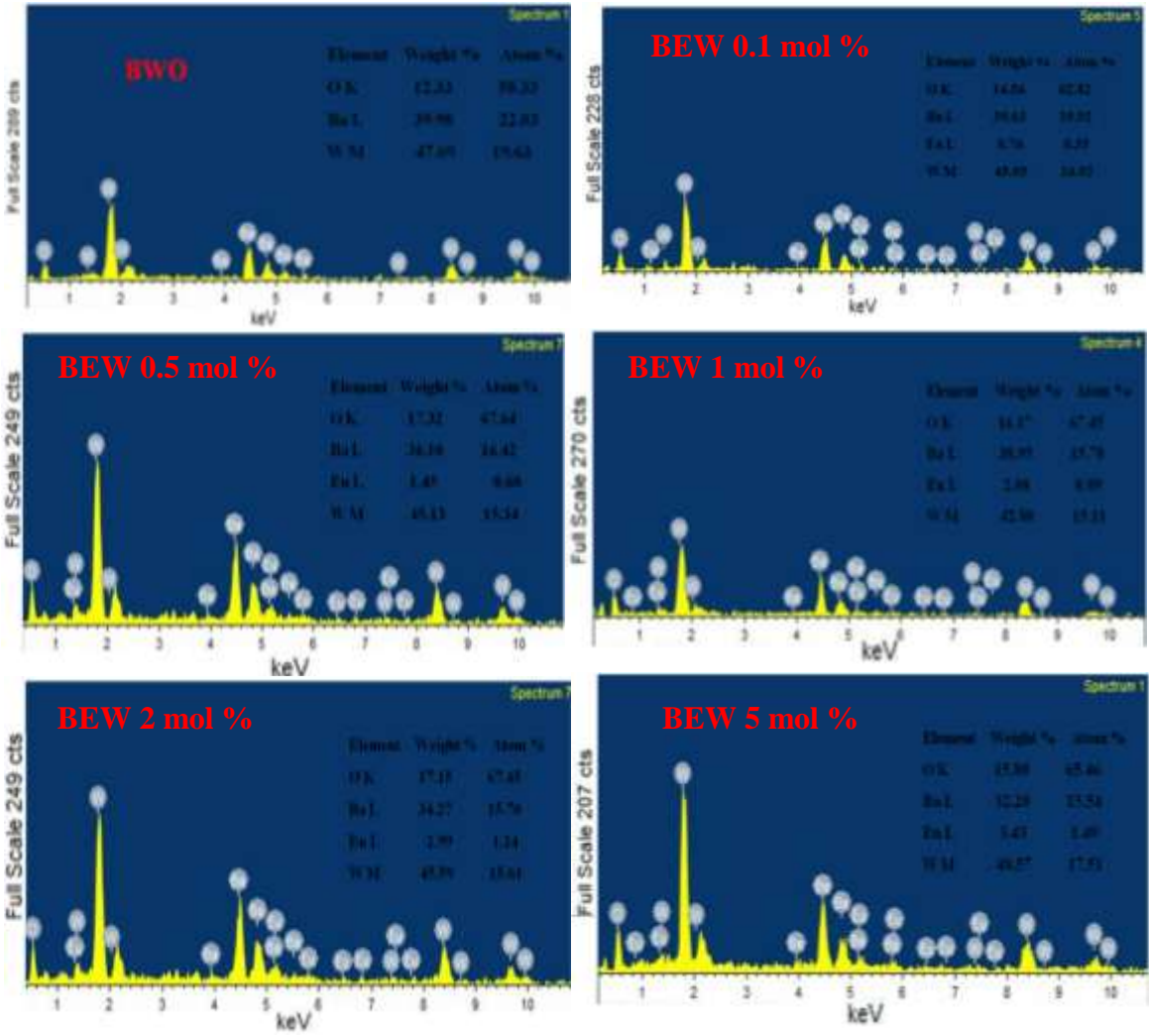


Figure S3 Obtained EDX spectra along with elemental compositions of the pure and BaWO₄ : Eu³⁺ samples calcined at 1100 °C.