

Supporting Information

Synthesis and Characterization of Yellow Pigment (Li_{0.4}RE_{0.6}Al_{0.6})_{1/2}MoO₄-BiVO₄ with high NIR reflectance

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Table S1 Lattice parameters, crystallite size and strain calculations of $[(\text{Li}_{0.4}\text{RE}_{0.6}\text{Al}_{0.6})_{0.1}\text{Bi}_{0.8}][\text{Mo}_{0.2}\text{V}_{0.8}]\text{O}_4$ (RE=La-Lu) pigments powder.

Sample	a (Å)	b (Å)	c (Å)	V (Å) ³	Crystallite size (Å)	Strain calculations
La	5.1289	5.1289	11.6734	307.06	2709	0.110
Nd	5.1293	5.1293	11.0523	306.57	2361	0.055
Sm	5.1379	5.1379	11.5886	305.92	2022	0.069
Eu	5.1246	5.1246	11.6345	305.54	2434	0.084
Gd	5.1240	5.1240	11.6334	306.03	2471	0.087
Tb	5.1212	5.1212	11.6311	305.05	2123	0.085
Dy	5.1194	5.1194	11.6539	305.42	1648	0.056
Y	5.1254	5.1254	11.5198	302.63	3477	0.147
Tm	5.1206	5.1206	11.6259	304.60	2016	0.084
Yb	5.1280	5.1280	11.6390	306.07	2128	0.063
Lu	5.1219	5.1219	11.6292	305.07	3472	0.085

Table S2 Lattice parameters, and strain calculations of $[(\text{Li}_{0.4}\text{La}_{0.6}\text{Al}_{0.6})_{x/2}\text{Bi}_{1-x}][\text{Mo}_x\text{V}_{1-x}]\text{O}_4$ ($x=0-0.4$) pigments.

Sample	<i>a</i> (Å)	<i>b</i> (Å)	<i>c</i> (Å)	V (Å) ³	Strain calculations
<i>x = 0</i>	5.1935	5.0898	11.6972	309.2	0.028
<i>x = 0.1</i>	5.1470	5.1470	11.7216	310.52	0.021
<i>x = 0.2</i>	5.1289	5.1289	11.6734	307.06	0.110
<i>x = 0.3</i>	5.1391	5.1391	11.7083	309.21	0.138
<i>x = 0.4</i>	5.1469	5.1469	11.7191	305.45	0.109

Table S3 D10, D50, D90 of $[(\text{Li}_{0.4}\text{La}_{0.6}\text{Al}_{0.6})_{x/2}\text{Bi}_{1-x}][\text{Mo}_x\text{V}_{1-x}]\text{O}_4$ ($x=0-0.4$) pigment powder.

sample	D10	D50	D90
$x=0$	269.16	542.31	1092.65
$x=0.1$	142.76	278.93	544.99
$x=0.2$	143.52	284.62	564.45
$x=0.3$	43.14	86.21	172.27
$x=0.4$	109.98	220.06	440.32

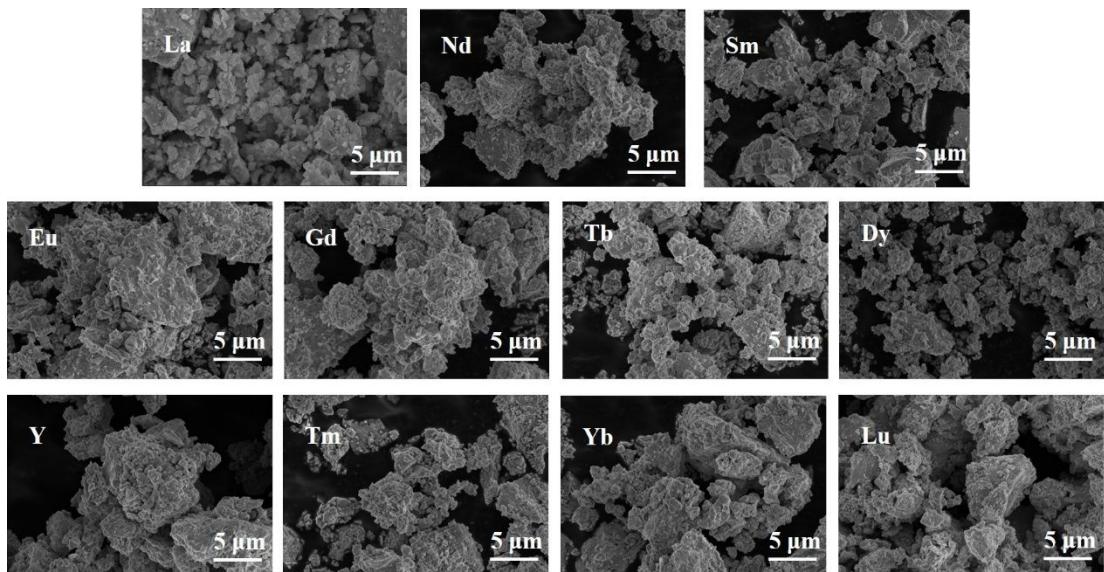
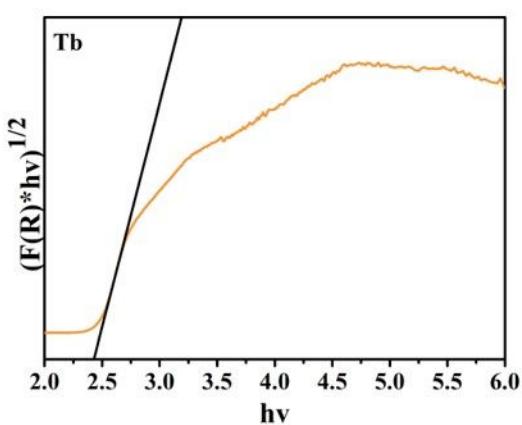
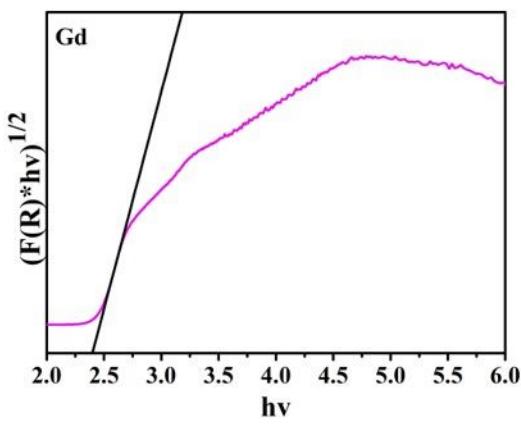
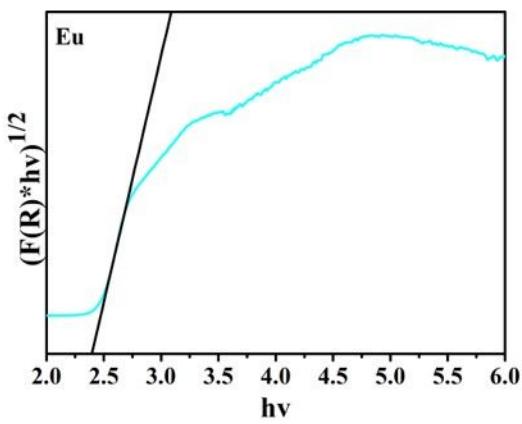
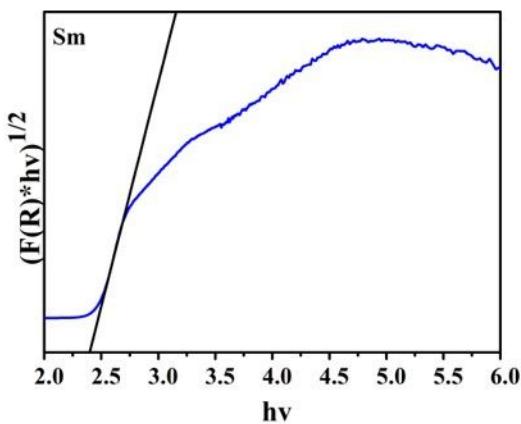
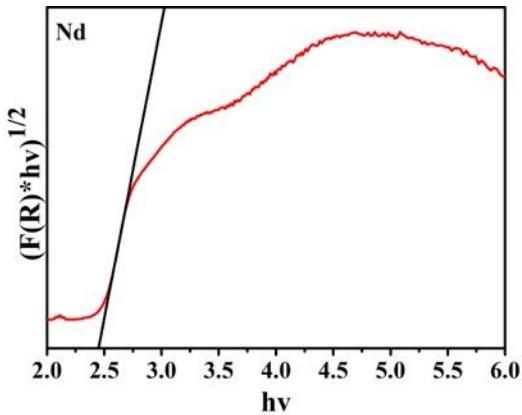
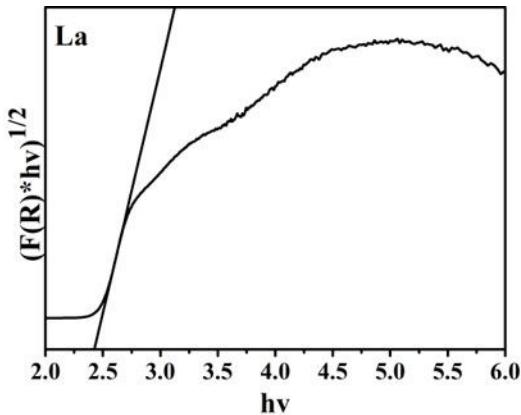


Figure S1 SEM images of $[(\text{Li}_{0.4}\text{RE}_{0.6}\text{Al}_{0.6})_{0.1}\text{Bi}_{0.8}][\text{Mo}_{0.2}\text{V}_{0.8}]\text{O}_4$ (RE=La-Lu) pigments.



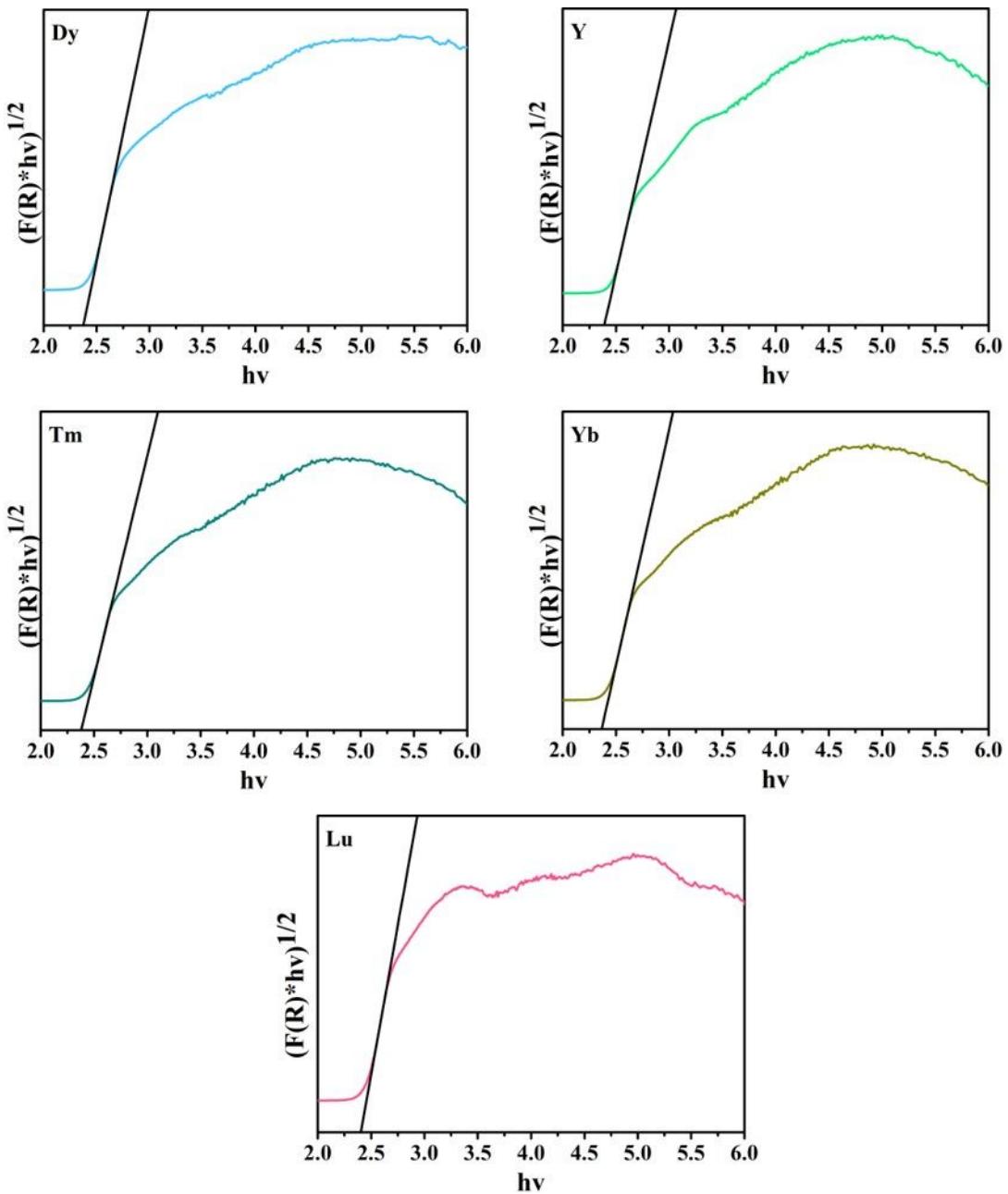


Figure S2 Absorption edges of $[(\text{Li}_{0.4}\text{RE}_{0.6}\text{Al}_{0.6})_{0.1}\text{Bi}_{0.8}][\text{Mo}_{0.2}\text{V}_{0.8}]\text{O}_4$ (RE=La-Lu) compounds measured with K-M theory (R represents the diffuse reflectance).

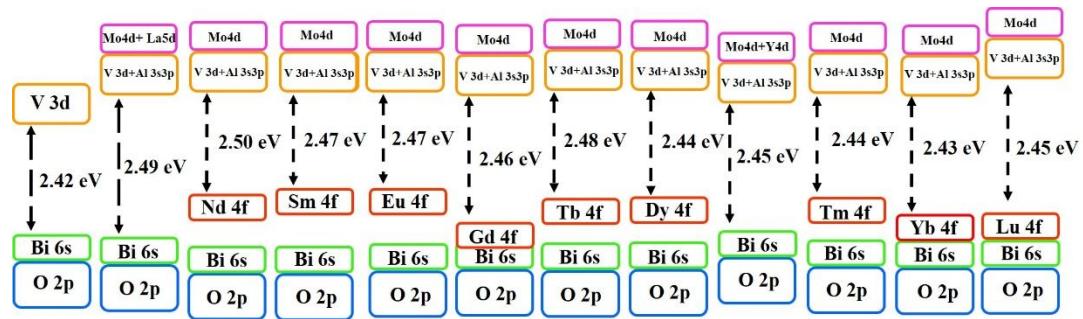


Figure S3 Schematic diagram of various rare earth substitution orbitals

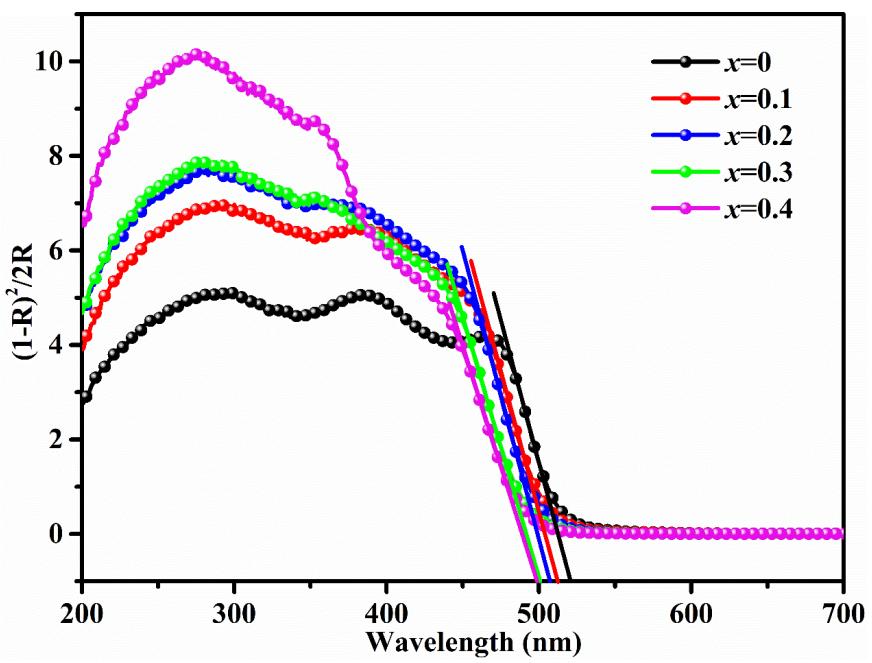


Figure S4 Kubelka–Munk plot with the corresponding absorption edge