

## Electronic Supplementary Information (ESI)

### Controlling elastically-mechanoluminescence in diphasic (Ba,Ca)TiO<sub>3</sub>:Pr<sup>3+</sup> by co-doping different rare earth ions

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**Table S2.** The calculated trap depth and ThL intergral intensity (Peak 2) of (Ba,Ca)TiO<sub>3</sub>:Pr<sup>3+</sup>,RE

**Table 1.** EML intensities of (Ba,Ca)TiO<sub>3</sub>:Pr<sup>3+</sup>,RE in comparison with that of (Ba,Ca)TiO<sub>3</sub>:Pr<sup>3+</sup> for the 1st and 2nd EML peaks.

<b>Co-doped</b>	<b>1st EML peak</b>	<b>1st EML peak int.</b>	<b>2nd EML peak</b>	<b>2nd EML peak int.</b>
<b>RE ion</b>	<b>int. (a.u.)</b>	<b>RE/none ×100%</b>	<b>int. (a.u.)</b>	<b>RE/none ×100%</b>
<b>none</b>	2436	100%	874	100%
<b>Y</b>	2939	120.6%	979	112.0%
<b>La</b>	3380	138.8%	1494	170.9%
<b>Ce</b>	0	0	0	0
<b>Nd</b>	3260	133.8%	1195	136.7%
<b>Sm</b>	2075	85.2%	758	86.7%
<b>Eu</b>	1356	55.7%	698	79.9%
<b>Gd</b>	3923	161.0%	1442	165.0%
<b>Tb</b>	2353	96.6%	937	107.2%
<b>Dy</b>	1412	58.0%	510	58.4%
<b>Ho</b>	2133	87.6%	898	102.7%
<b>Er</b>	1401	57.5%	510	58.4%
<b>Tm</b>	1646	67.6%	645	73.8%
<b>Yb</b>	2743	112.6%	1087	124.4%
<b>Lu</b>	3090	126.8%	1150	131.6%

**Table 2.** The calculated trap depth and ThL intergral intensity (Peak 2) of (Ba,Ca)TiO<sub>3</sub>:Pr<sup>3+</sup>,RE

Co-doped RE ion	<i>E</i> (eV)	ThL integral intensity (a.u.)	ThL integral intensity RE/none ×100%
<b>none</b>	0.356	1382.5	100%
<b>Y</b>	0.377	1676.9	121.3%
<b>La</b>	0.313	2120.6	153.4%
<b>Ce</b>	0	0	0
<b>Nd</b>	0.330	1579.1	114.2%
<b>Sm</b>	0.309	1218.6	88.1%
<b>Eu</b>	0.330	1032.9	74.7%
<b>Gd</b>	0.351	2058.7	148.9%
<b>Tb</b>	0.369	1248.3	90.3%
<b>Dy</b>	0.376	800.8	57.9%
<b>Ho</b>	0.326	1210.9	87.6%
<b>Er</b>	0.352	904.6	65.4%
<b>Tm</b>	0.317	1114	80.6%
<b>Yb</b>	0.376	1654.3	119.7%
<b>Lu</b>	0.321	2001.9	144.8%