

Electronic Supplementary Information

Lanthanide-titanium-oxalate-clusters and their degenerated products, photocurrent response and photocatalytic behaviours

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Figures

Fig. S1. Ball-stick plot of **2**, showing the molecular structure.

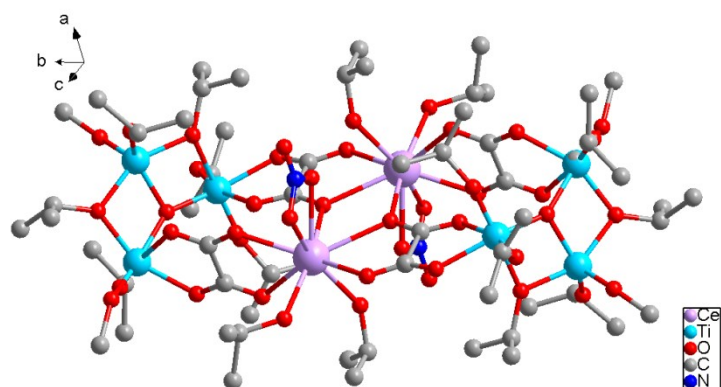
Fig. S2. (a) IR spectra of compounds **1–3** (measured as quickly as possible. (b) the degenerated samples **1'–3'**.

Fig. S3. Comparing of IR spectra of **1'–3'** with the $\text{Ce}_2(\text{C}_2\text{O}_4)_3$.

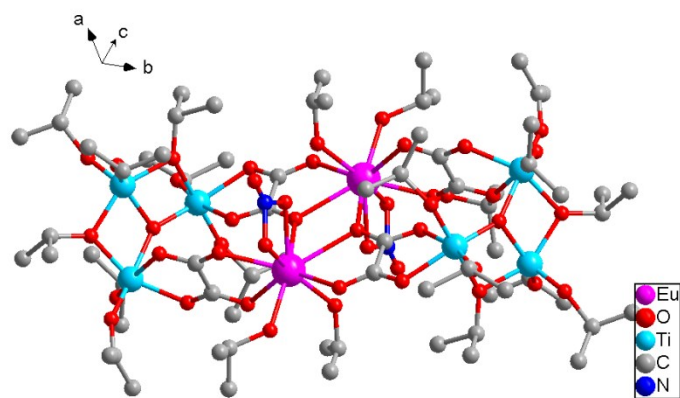
Fig. S4. EDS data of **1'–3'**.

Fig. S5. UV-vis spectra of **1'–3'** in eV presentation.

Table S1. Crystal data and structural refinement parameters for **1** and **2**.

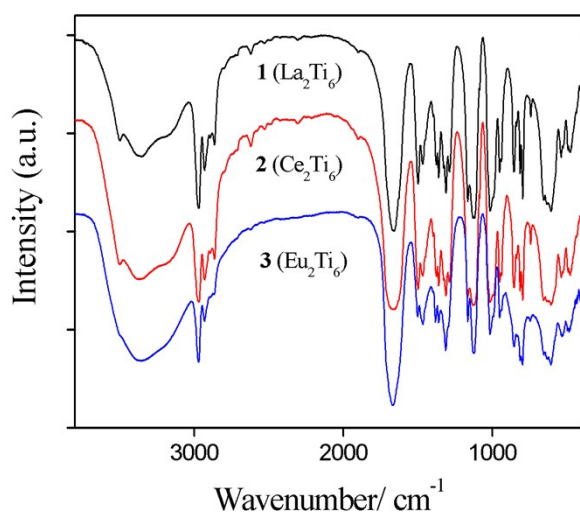


(a)

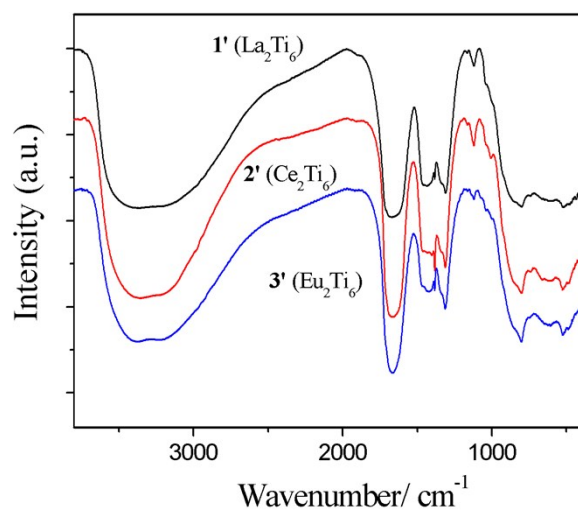


(b)

Fig. S1. Ball-stick plots of **2** (a) and **3** (b) showing the molecular structure. The **3** is a pre-solved structure.



(a)



(b)

Fig. S2. (a) IR spectra of compounds 1–3 (measured as quickly as possible). (b) the degenerated samples 1'–3'.

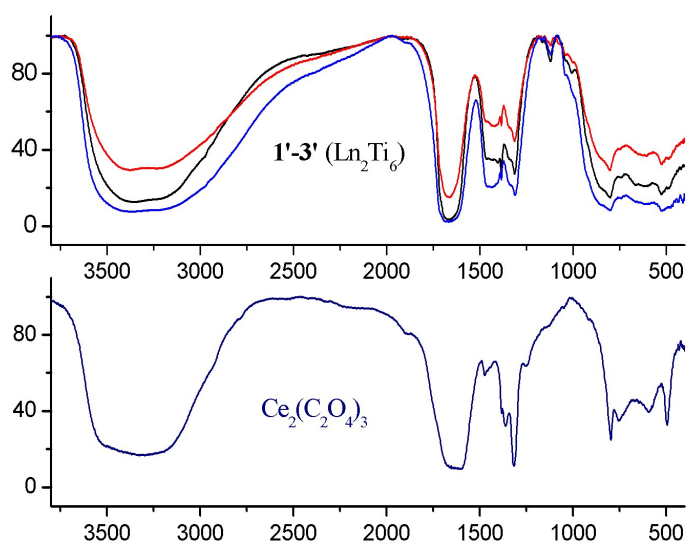
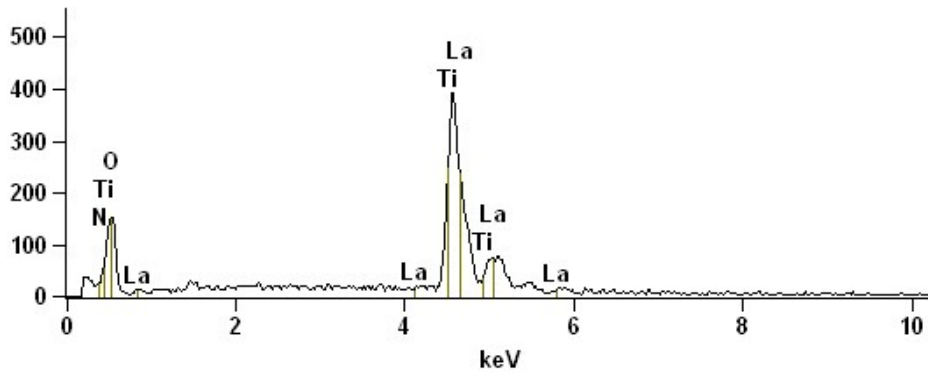


Fig. S3. Comparing of IR spectra of $1'-3'$ with the $\text{Ce}_2(\text{C}_2\text{O}_4)_3$.

Ln-TiO-C₂O₄ (1)

Full scale counts: 392

Base(30)_pt1

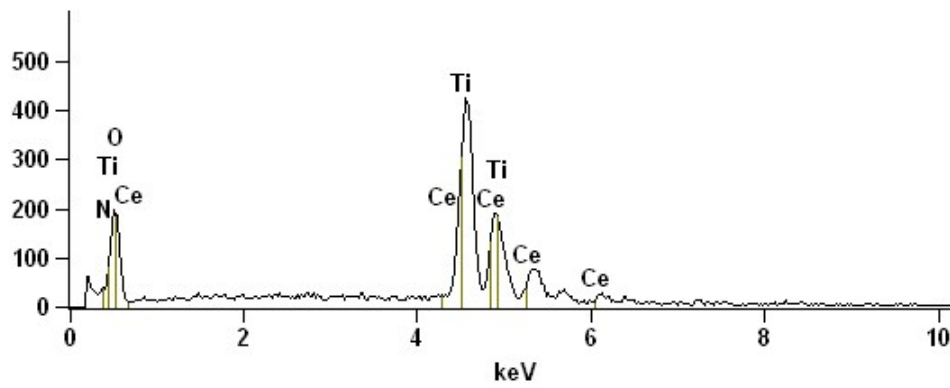


	<i>C-K</i>	<i>N-K</i>	<i>O-K</i>	<i>Ti-K</i>	<i>La-L</i>
<i>Base(30)_pt1</i>	22.91	0.00	68.74	6.30	2.06

Ce-TiO-C₂O₄ (2)

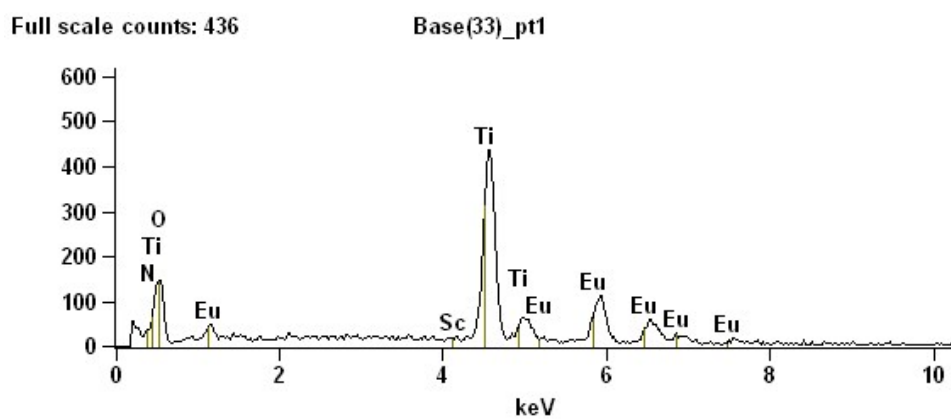
Full scale counts: 424

Base(30)_pt1



	<i>C-K</i>	<i>N-K</i>	<i>O-K</i>	<i>Ti-K</i>	<i>Ce-L</i>
<i>Base(30)_pt1</i>	19.54	0.00	73.58	5.93	1.94

Eu-TiO-C₂O₄ (3)



	<i>C-K</i>	<i>N-K</i>	<i>O-K</i>	<i>Ti-K</i>	<i>Eu-L</i>
<i>Base(33)_pt1</i>	25.96	0.00	64.35	7.62	1.96

Fig. S4. EDS data of 1'-3'.

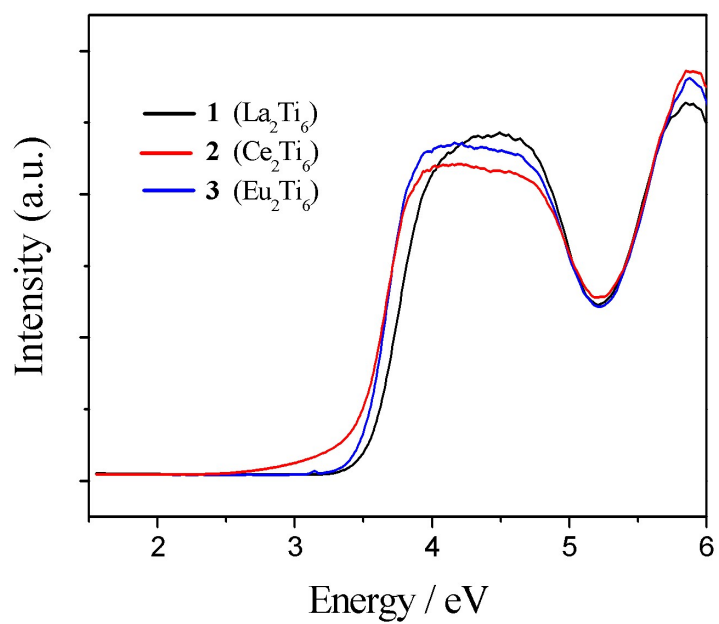


Fig. S5. UV-vis spectra of 1'–3' in eV presentation.

Table S1. Crystal data and structural refinement parameters for **1** and **2**.

	1	2
formula	C ₇₄ H ₁₅₆ La ₂ N ₂ O ₄₆ Ti ₆	C ₇₄ H ₁₅₆ Ce ₂ N ₂ O ₄₆ Ti ₆
fw	2375.03	2377.45
cryst size (mm ³)	0.20×0.45×0.50	0.15×0.20×0.35
cryst syst	triclinic	triclinic
space group	<i>P</i> $\bar{1}$	<i>P</i> $\bar{1}$
<i>a</i> (Å)	11.6585(5)	11.3596(6)
<i>b</i> (Å)	21.7777(10)	21.1998(12)
<i>c</i> (Å)	24.1796(12)	23.9317(13)
α (deg)	106.086(4)	105.4150(10)
β (deg)	90.174(4)	90.3820(10)
γ (deg)	94.037(4)	94.5150(10)
<i>V</i> (Å ³)	5882.5(5)	5536.4(5)
<i>Z</i>	2	2
ρ_{calcd} (g cm ⁻³)	1.332	1.431
<i>F</i> (000)	2424	2460
μ (mm ⁻¹)	1.171	1.296
<i>T</i> (K)	293(2)	293(2)
reflns collected	66241	28280
unique reflns	21132	19365
observed reflns	12980	14081
no. params	1156	1171
GOF on <i>F</i> ²	1.027	1.022
<i>R</i> ₁ [<i>I</i> >2 σ (<i>I</i>)]	0.0560	0.0564
<i>wR</i> ₂ [<i>I</i> >2 σ (<i>I</i>)]	0.1440	0.1418