Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Fast and Versatile Electrodeposition of vertically Aligned Layered Rare-Earth Hydroxide (LREH) Nanosheets for Multicolor luminescence and Oil/Water Separation

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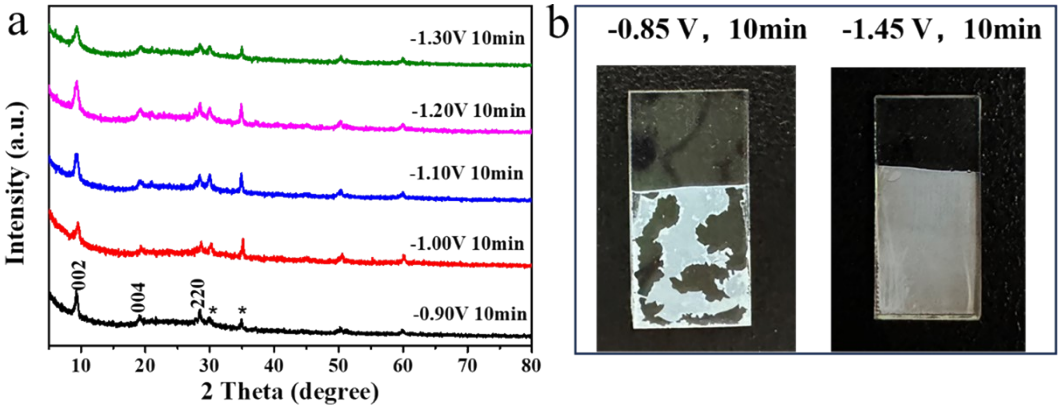

Fig. S1. XRD patterns (a), and actual picture (b) of the $Y_2(OH)_5NO_3 \cdot nH_2O$ film fabricated under different working voltages at room temperature. The peaks marked by asterisks are from the ITO substrate.

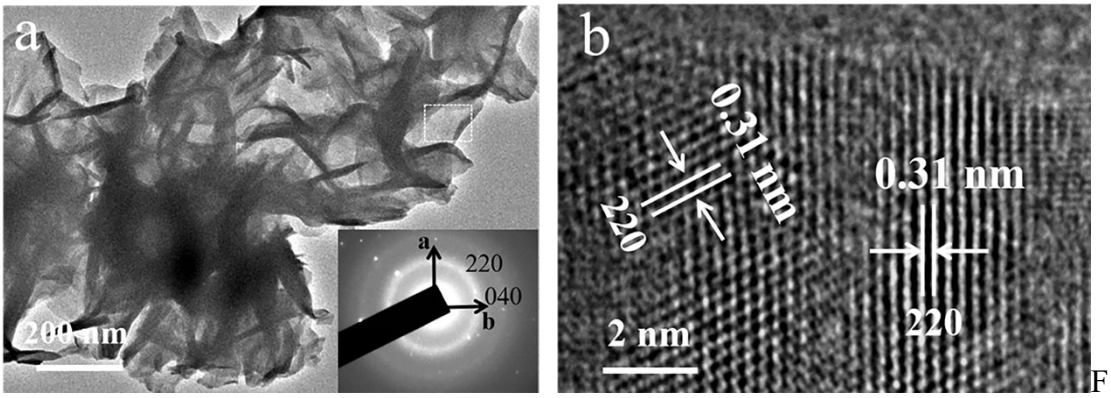

Fig. S2. TEM image (a), and HR-TEM image (b) of the electrodeposited $Y_2(OH)_5NO_3 \cdot nH_2O$ film. The inset in (a) selected area electron diffraction (SAED) taken from the rectangle area.

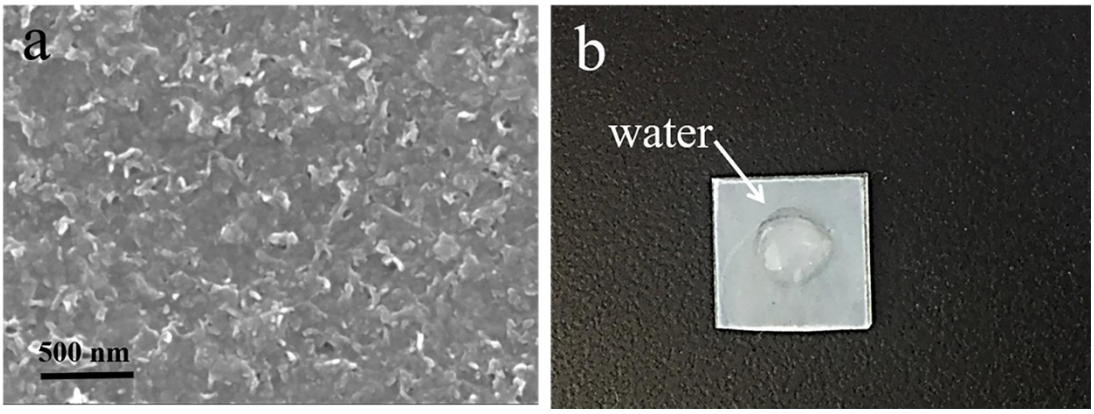

Fig. S3. SEM morphology (a) and the physical image of water droplets attached to the surface (b) of $Y_2(OH)_5NO_3 \cdot nH_2O$ film prepared *via* traditional technique.

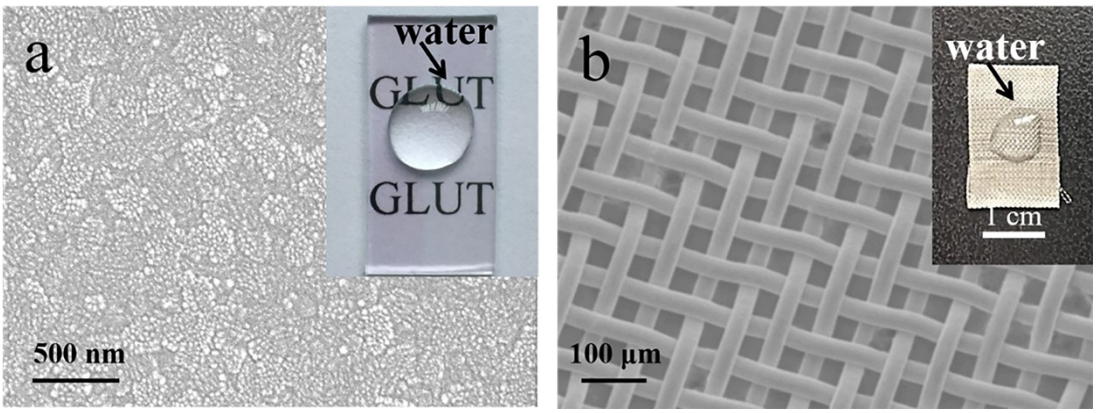

Fig. S4. FE-SEM image of the surface for ITO glass (a) and the original nikle mesh substrate (b). The insets in (a) and (b) are the corresponding physical images of water droplets attached to the surface, respectively.

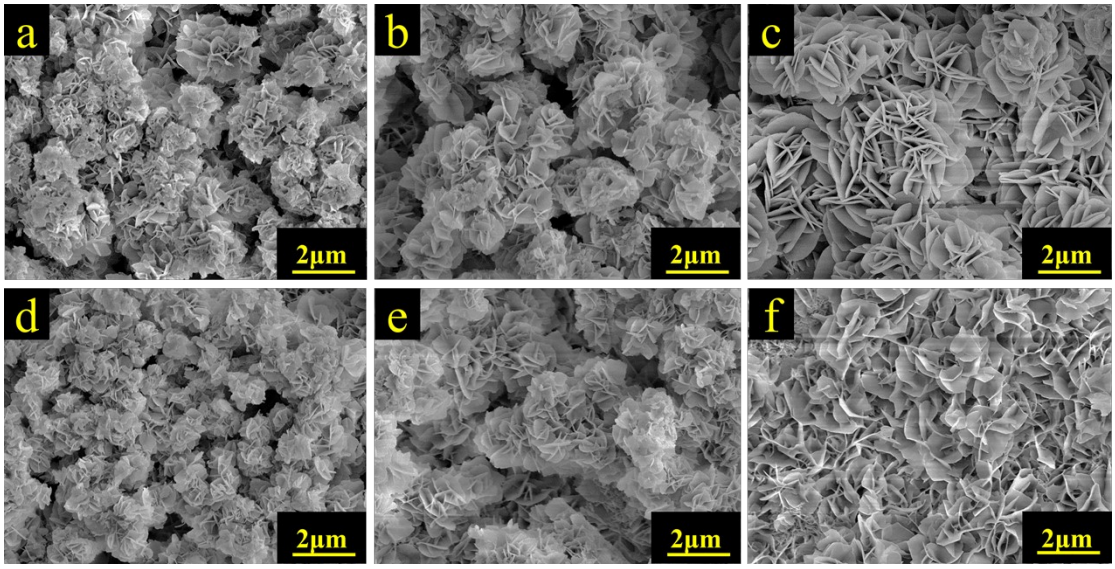

Fig. S5. FE-SEM morphologies of the $Y_2(OH)_5NO_3 \cdot nH_2O$ films fabricated under 30 ^oC, -1.10 V, 0.1 M (a); 55 ^oC, -1.10 V, 0.1 M (b); 70 ^oC, -1.10 V, 0.1 M (c); 40 ^oC, -1.10 V, 0.1 M (d); 40 ^oC, -1.20 V, 0.1 M (e); and 40 ^oC, -1.30 V, 0.1 M (f).

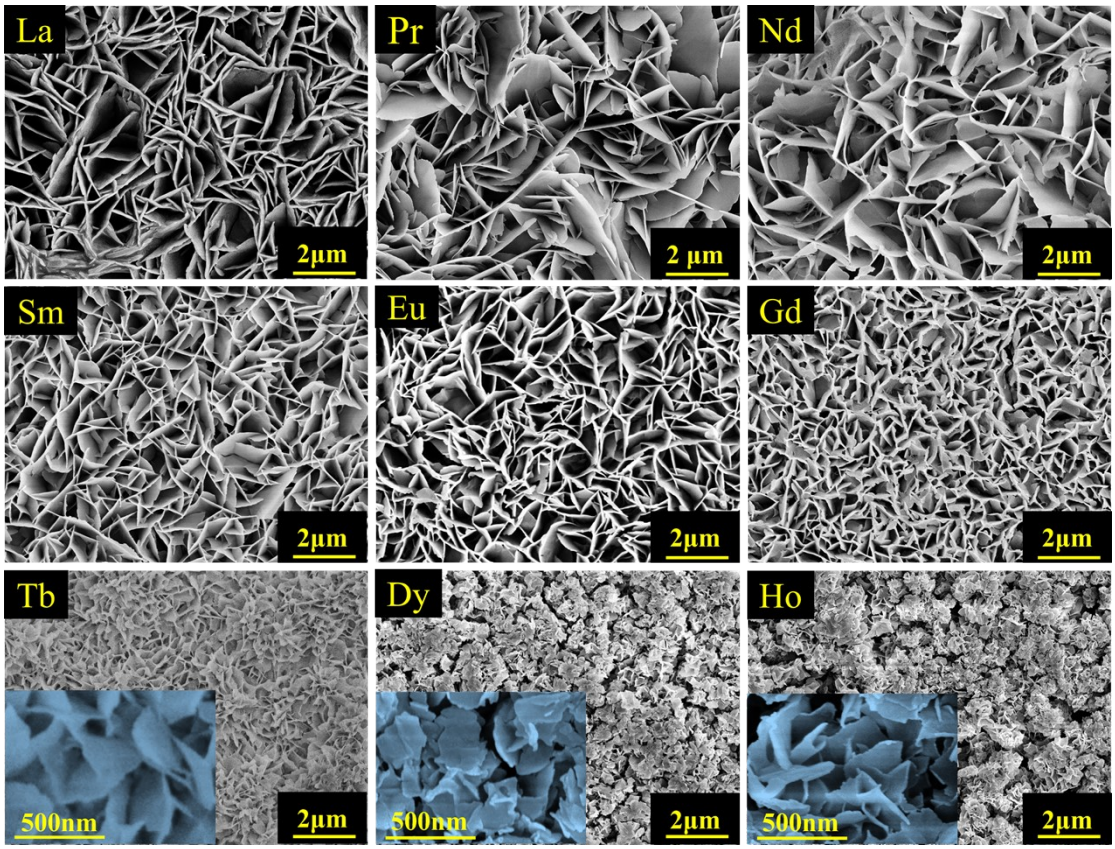

Fig. S6. FE-SEM morphologies of the $RE_2(OH)_5NO_3 \cdot nH_2O$ (RE = La, Pr, Nd, Sm, Eu, Gd, Tb, Dy and Ho) films prepared using 0.1 M $RE(NO_3)_3$ and under the working voltage of -1.15 V at room temperature.

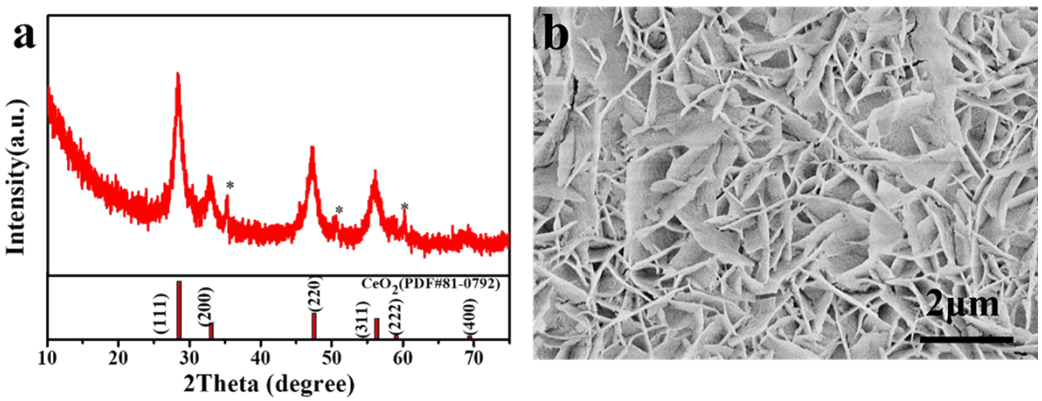

Fig. S7. XRD pattern (a) and FE-SEM observation (b) of the CeO_2 film fabricated using 0.1 M $Ce(NO_3)_3$ and under the working voltage of -1.15 V at room temperature. The peaks marked by asterisks are from the ITO substrate.

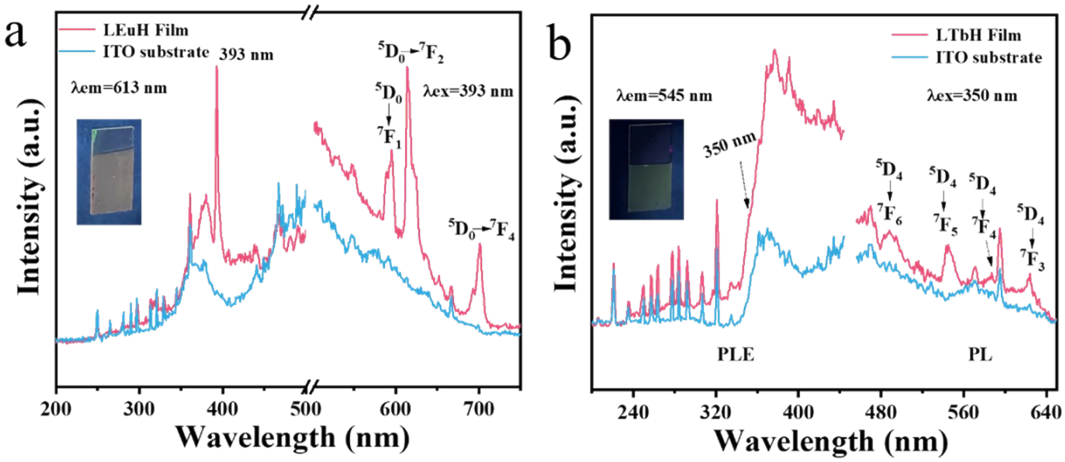

Fig. S8. PL/PLE spectra of the LEuH films under the 393 nm excitation (a); PL/PLE spectra of the LTbH films under the 350 nm excitation (b). The insets of (a-b) show luminescence of the corresponding LEuH/LTbH films under 365 nm excitation from a hand-held UV lamp.