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

Electronic Supplementary Information

Structural, Photoluminescent Investigation of LTbH/LEuH Nanosheets and Their Color-Tunable Colloidal Hybrids

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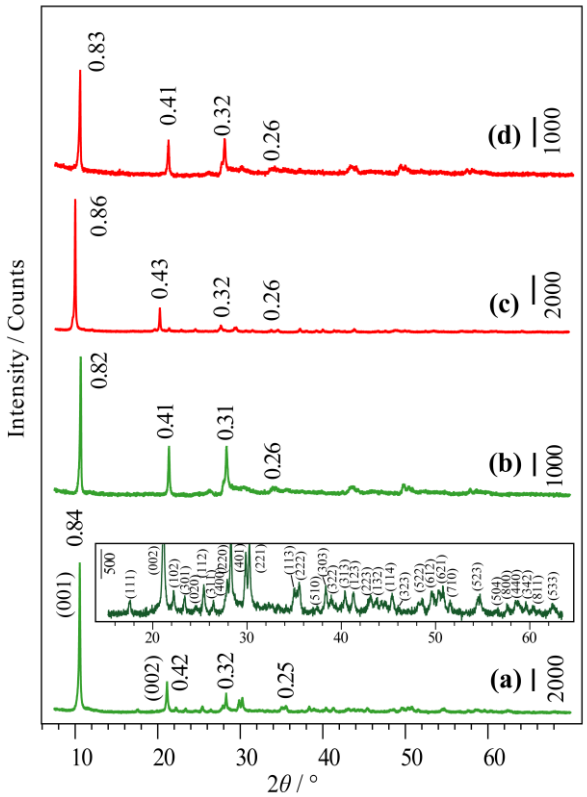

Fig. S1 XRD patterns of (a) Cl^--LTbH, (b) NO_3^--LTbH, (c) Cl^--LEuH, and (d) NO_3^--LEuH.

All the diffraction peaks of Cl^--LTbH are indexable to the space group of $P2_12_12$ (orthorhombic symmetry), according to the reference.[10a]

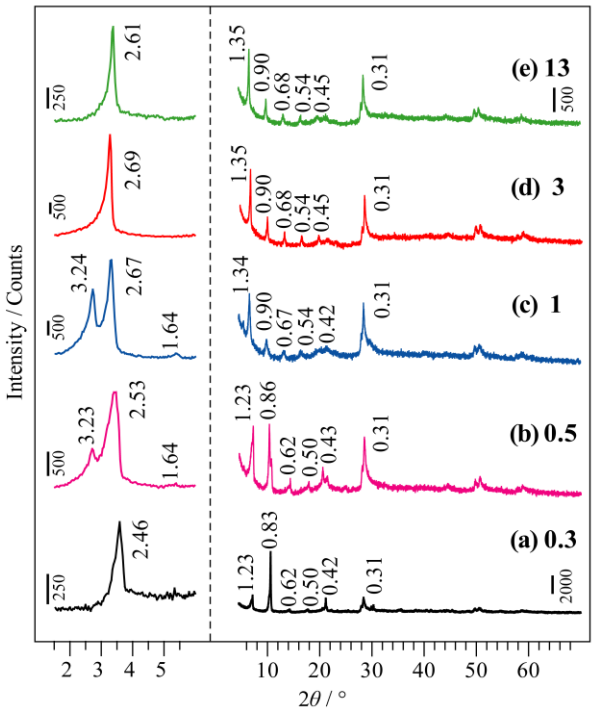

Fig. S2 XRD patterns of DS^- intercalated LTbH samples with different DS^-/Tb^{3+} molar ratios (a) 0.3, (b) 0.5, (c) 1, (d) 3, and (e) 13.

The diffraction peaks of the DS^--LRHs were obtained *via* the same synthesis method with different DS^-/Tb^{3+} molar ratios and different d_{basal} values were observed.

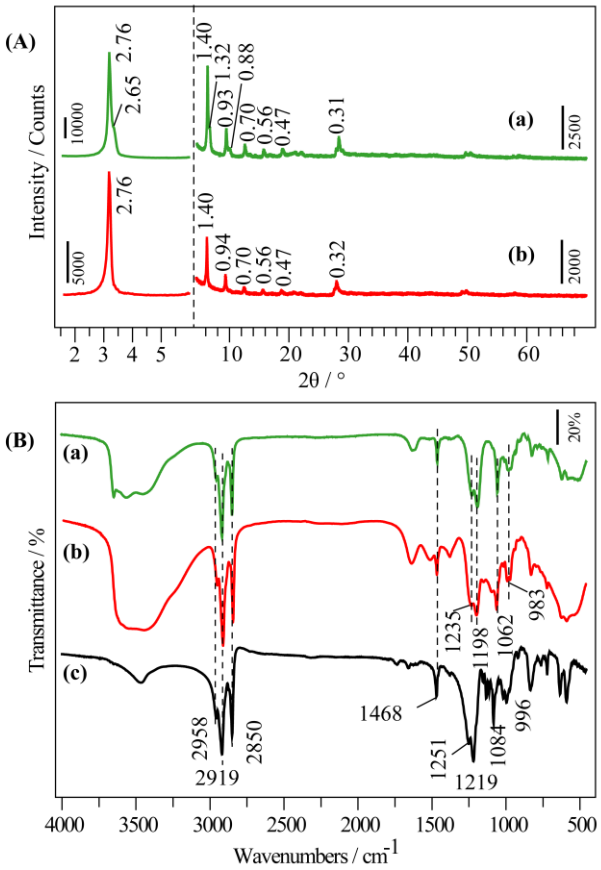

Fig. S3 XRD patterns and FT-IR spectra of the samples obtained by ion-exchange reaction from Cl^--type (a) LTbH and (b) LEuH*, comparing with (c) SDS.

The Cl^--type LTbH and LEuH samples were synthesized through the same method as described in the Experimental Section, except for the molar ratios of raw materials, i.e., $LnCl_3 \cdot 6H_2O$/NaCl/HMT = 1/13/1 were used. The ion-exchange reaction was carried out by following:

(1) The sample (100 mg) was immersed in 80 mL SDS aqueous solution. The mole of SDS was 3 times of Tb^{3+}.

(2) the mixture was autoclaved at 70 ºC for 48 h, and then filtered, washed with distilled water and anhydrous ethanol several times. The sample was finally air-dried at room temperature.

As shown in Fig. S3A, the basal spacings were changed to 2.76 nm, indicating the intercalation of DS^-. Fig. S3B showed the existence of DS^- in the samples.

Note:

* The XRD pattern of LEuH was obtained form Nankai Chu, Master Dissertation of Beijing Normal University, The syntheses, structures and properties of organic-layered europium hydroxide composites, 2012.

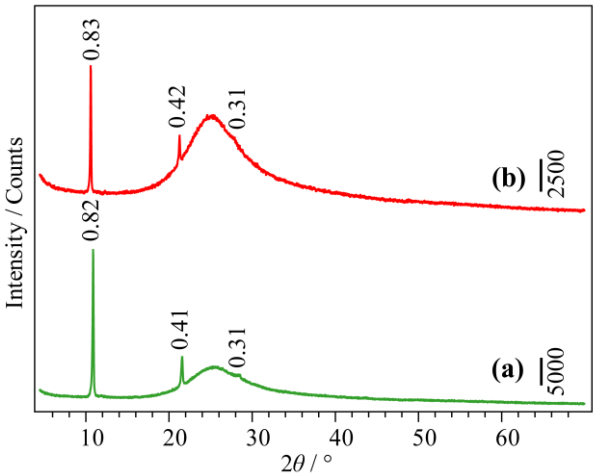

Fig. S4 XRD patterns of the aggregates centrifuged from (a) NO_3^--LTbH and (b) NO_3^--LEuH suspensions.

The sharp peaks show the well stacked layers. That is, the delamination is infeasible for the NO_3^--type LTbH and LEuH. The similar result was also obtained for the LRHs of Cl^--type.