

Supporting Information

Lanthanide-Doped Layered Double Hydroxides Intercalated with Sensitizing Anions: Efficient Energy Transfer between Host and Guest Layers

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Preparation of physical mixture of Tb(III) and NoTb-BPA

Briefly, 5 g of the wet cake of the as-prepared NoTb-BPA LDH sample was dispersed in 20 mL of deionized water by ultrasonication for 30 min. Meanwhile, a solution of terbium (III) chloride hexahydrate ($\text{TbCl}_3 \cdot 6\text{H}_2\text{O}$, 99.9%, Sigma-Aldrich) was prepared by dissolving 0.466 g of the salt in 80 mL of deionized water. The initial pH of TbCl_3 solution was about 4.0 and it was adjusted to neutral by adding three drops of the dilute NaOH solution. The LDH suspension was then mixed with TbCl_3 solution and the mixture was stirred at 70 °C for 24 h under nitrogen protection. The resulting suspension was centrifuged and the precipitate was dried in oven at 60 °C.

Table S1. Compositions of zeolite samples doped with Tb^{3+} .

Sample	%Tb (wt%) ^a	%C (wt%) ^b	%N (wt%) ^b	%BPA (wt%) ^c
ZY-Tb	20.0	0.0	0.05	-
ZY-Tb-BPA	21.1	3.3	0.09	4.15

^aThe weight percentage of Al and Tb obtained from EDS.

^bThe weight percentage of C and N obtained from CHN elemental analysis.

^cThe weight percentage of BPA obtained from UV-vis analysis.

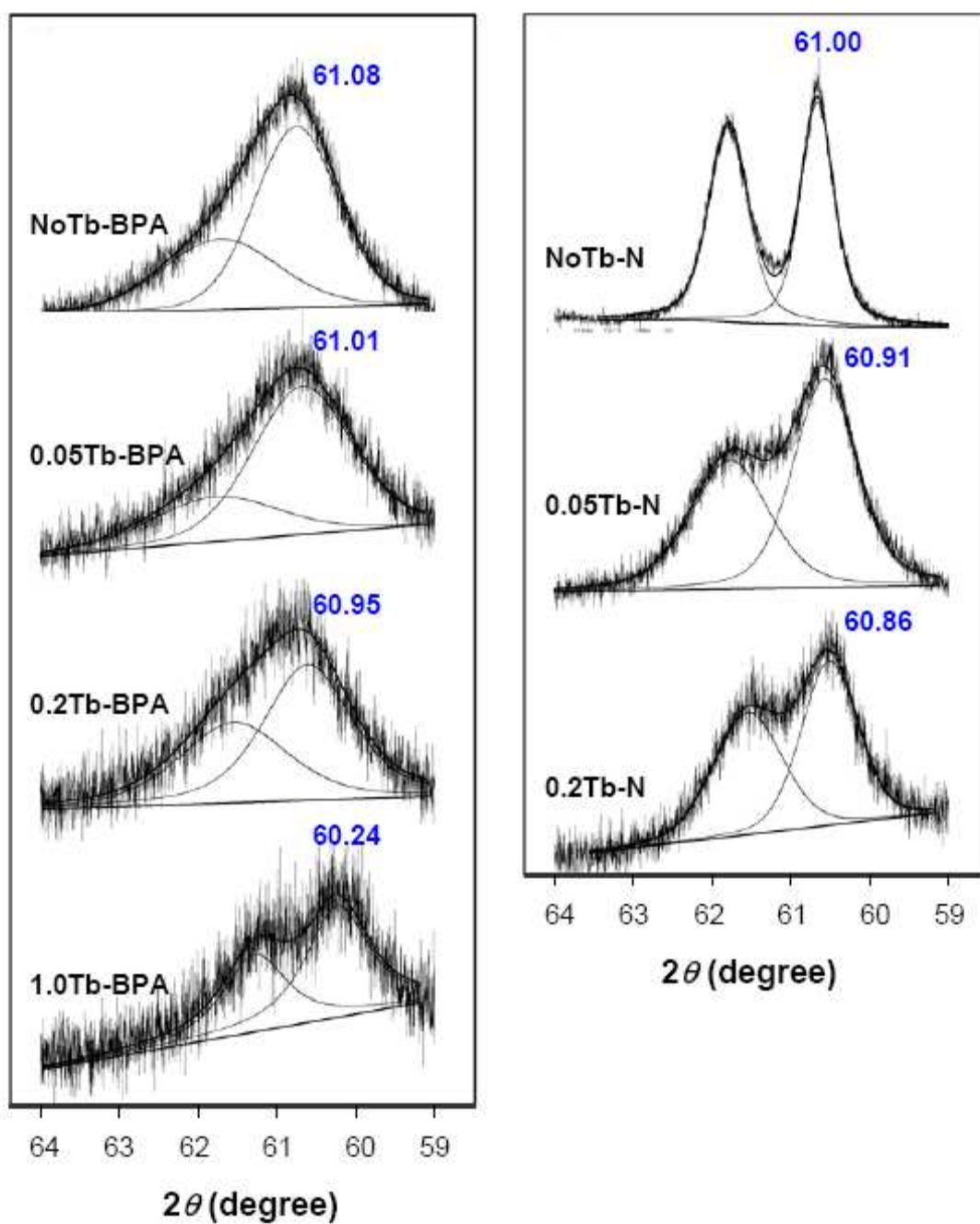


Figure S1. Deconvolution of (110) and (113) peaks for XRD patterns of LDH samples. The positions of (110) peaks are indicated on the curves.

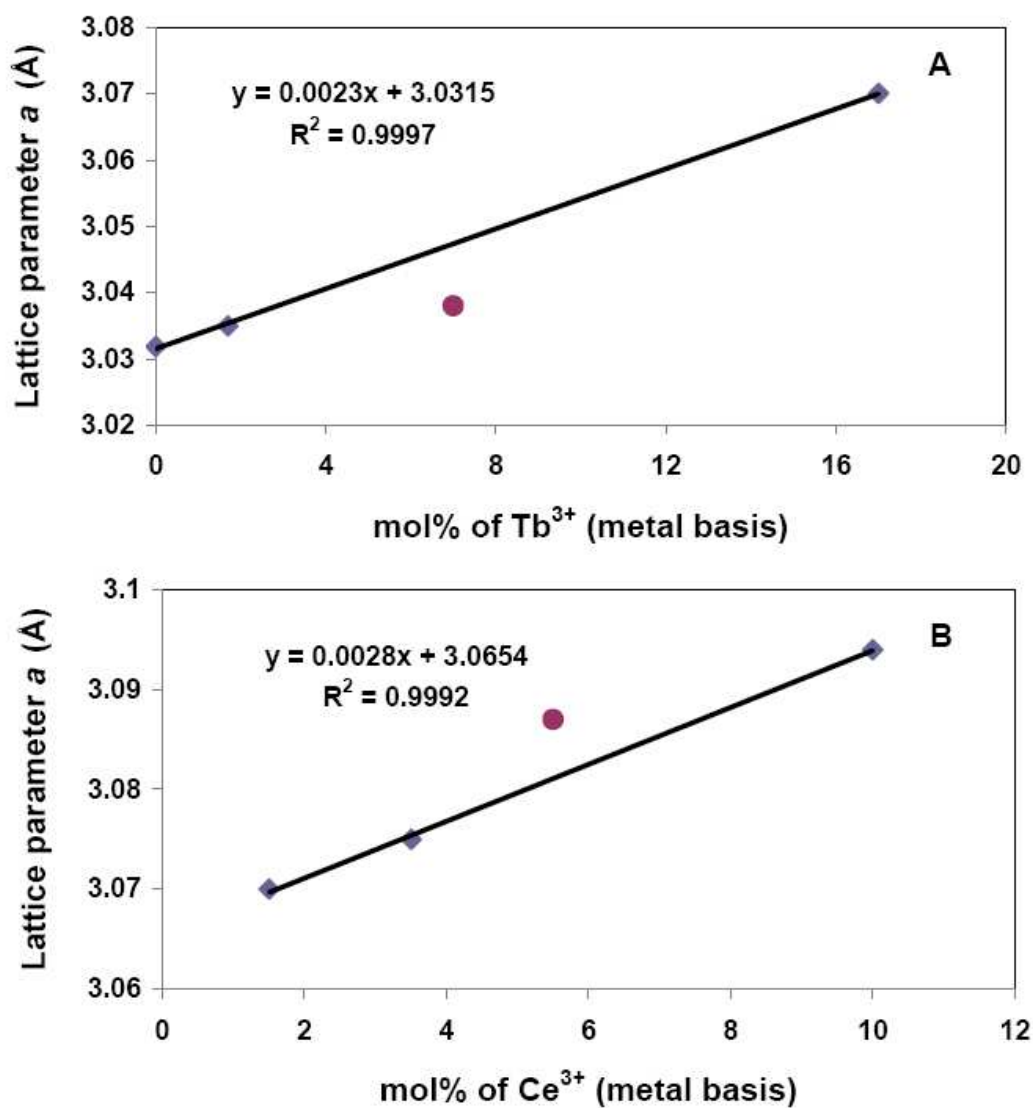


Figure S2. Lattice parameter a versus molar percentage of (A) Tb^{3+} ions in BPA intercalated LDH samples synthesized in this work, and (B) Ce^{3+} ions in LDH samples reported by Das et al.¹

Reference:

[1] Das, J.; Das, D.; Parida, K. M., *J. Colloid Interf. Sci.* **2006**, 301, 569.

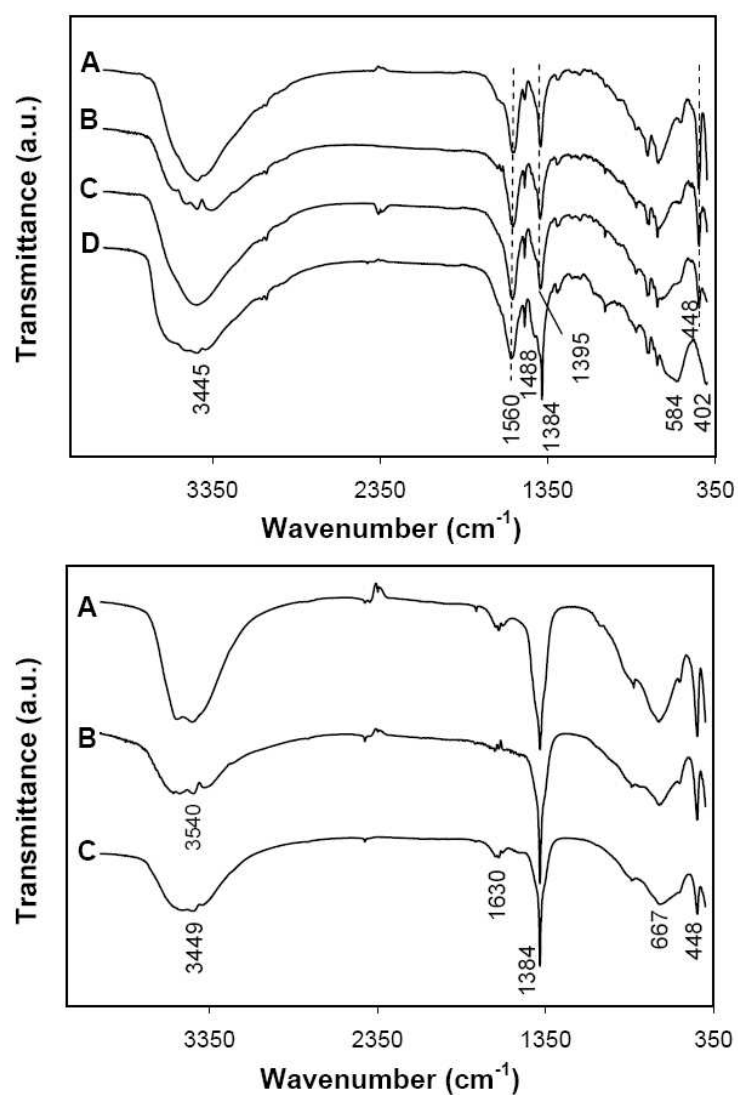


Figure S3. FTIR spectra of samples (A) NoTb-BPA, (B) 0.05Tb-BPA, (C) 0.2Tb-BPA, and (D) 1.0Tb-BPA in the upper part; (A) NoTb-N, (B) 0.05Tb-N, and (C) 0.2Tb-N in the lower part.

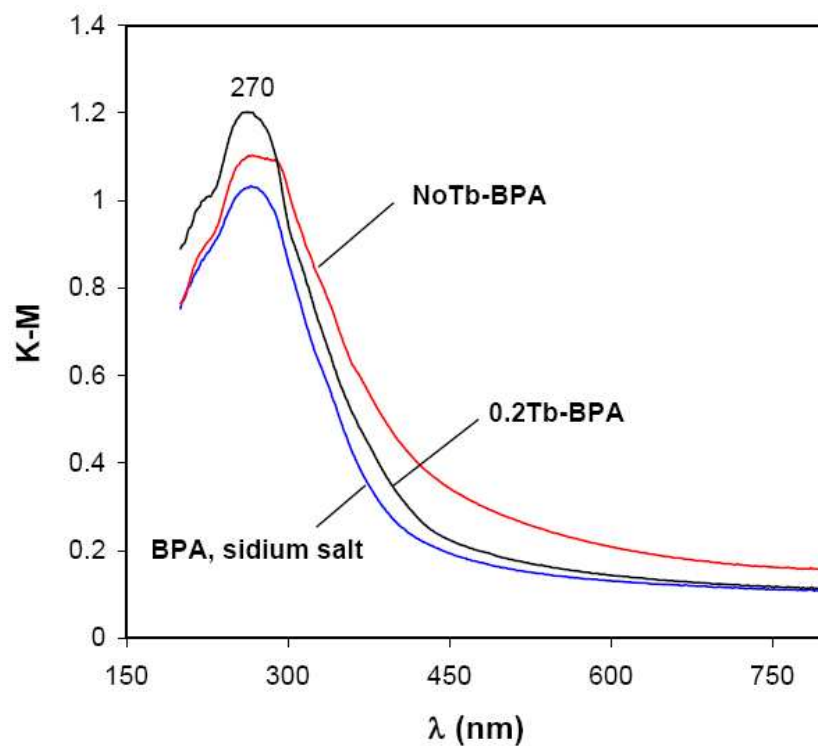


Figure S4. UV-vis diffuse reflectance spectra of samples NoTb-BPA, 0.2Tb-BPA and sodium salt of BPA.

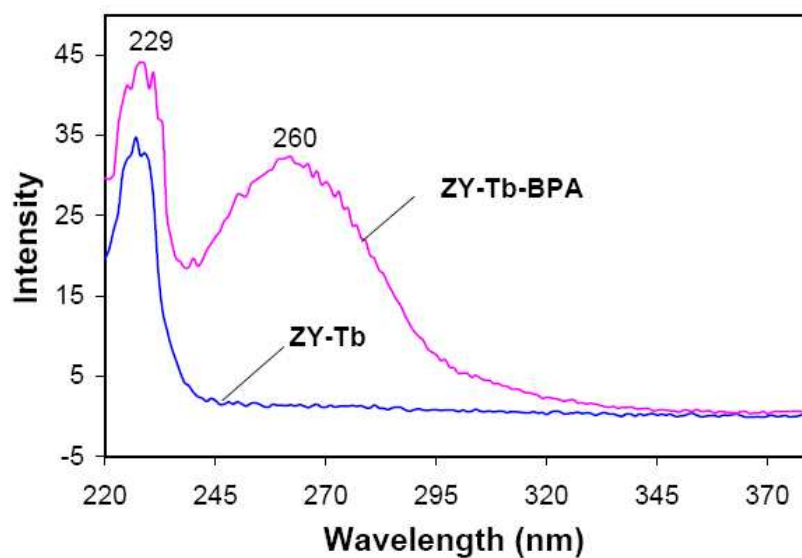


Figure S5. Excitation spectra ($\lambda_{em} = 542$ nm) of Tb^{3+} -doped zeolite samples with (ZY-Tb-BPA) or without BPA (ZY-Tb).