

Supporting Information

Amine Vapor Responsive Lanthanide Complex Entrapment: Control of Ligand-to-Metal and Metal-to-Metal Energy Transfer

*Peng Li, and Huanrong Li**

School of Chemical Engineering and Technology, Hebei University of Technology,

Guang Rong Dao 8, Hongqiao District, Tianjin 300130, P. R. China.

E-mail: lihuanrong@hebut.edu.cn

1. Spectroscopic and time resolved measurements

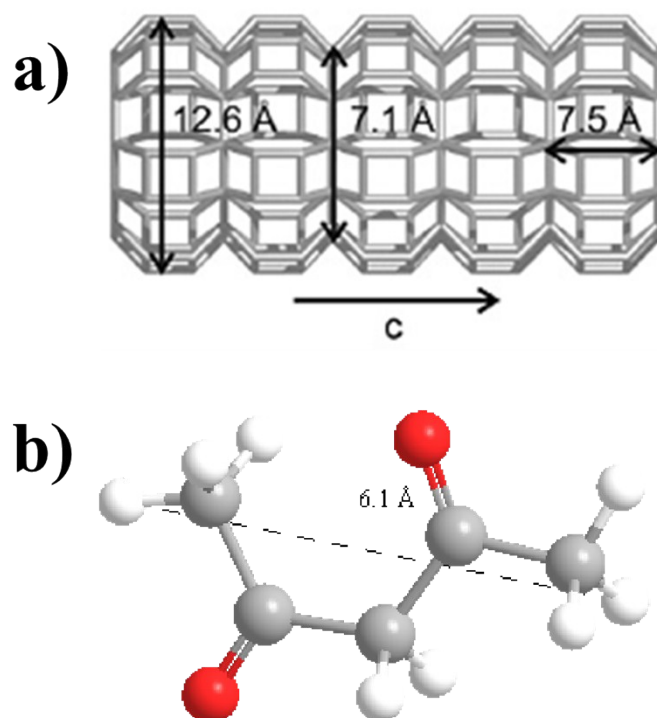


Figure S1. a) Schematic representation of ZL framework, b) Molecular structure of acac,

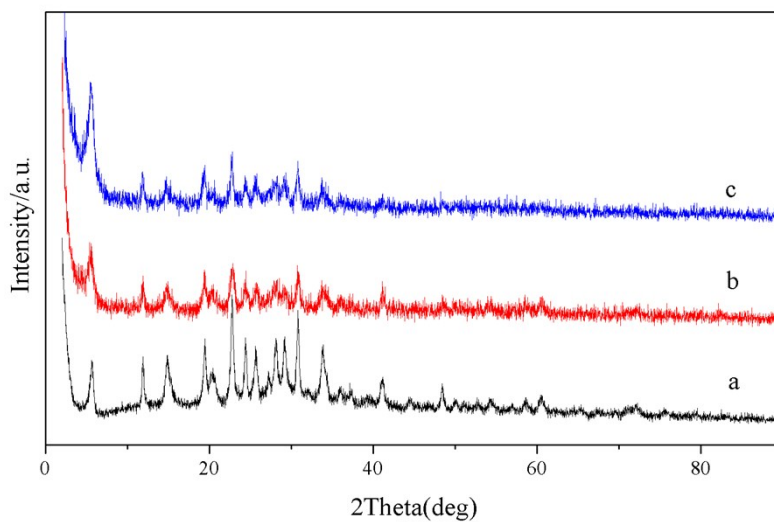


Figure S2. XRD pattern of a) nanozeolite (NZL) (black line) and b) $\text{Eu}_4\text{Tb}_6(\text{acac})_n@ \text{NZL}$ (red line). c) $\text{Eu}_4\text{Tb}_6(\text{acac})_n@ \text{NZL}$ upon exposure to Et_3N .

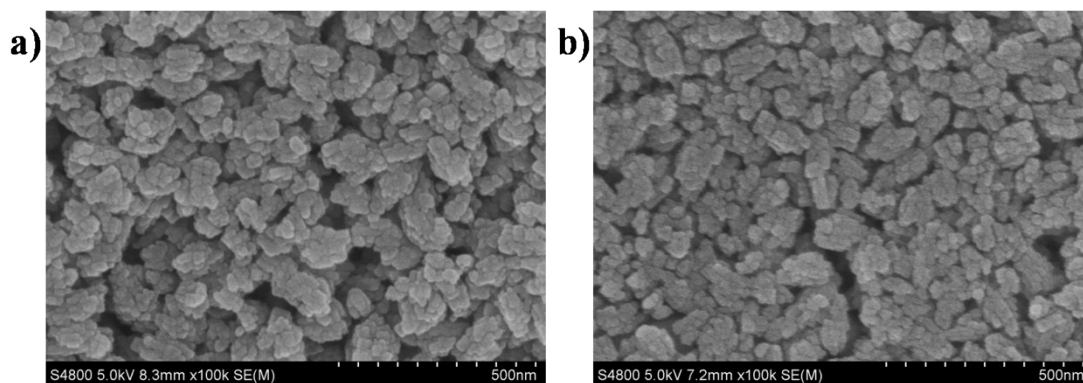


Figure S3. SEM images of (a) nanozeolite (NZL) and b) $\text{Eu}_4\text{Tb}_6(\text{acac})_n@NZL$.

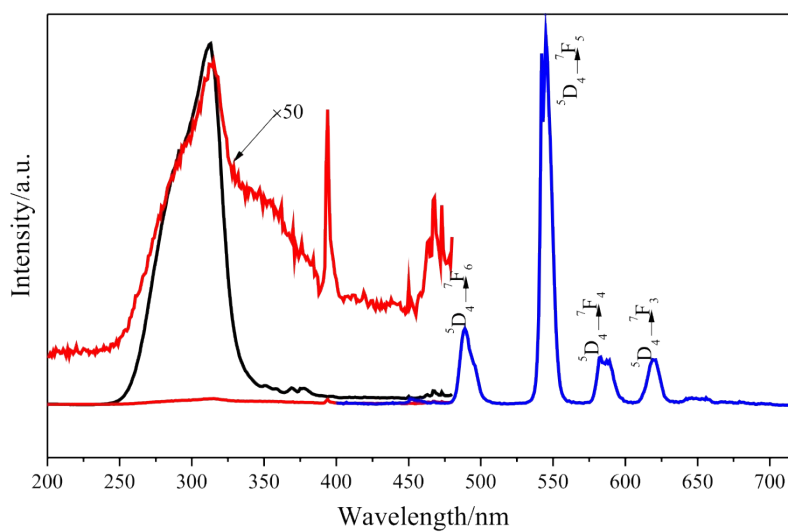


Figure S4. Excitation spectra of $\text{Eu}_4\text{Tb}_6(\text{acac})_n@NZL$ monitored at 544 nm (black line) and monitored at 612 nm (red line), emission spectrum (blue line) of $\text{Eu}_4\text{Tb}_6(\text{acac})_n@NZL$ excited at 310 nm.

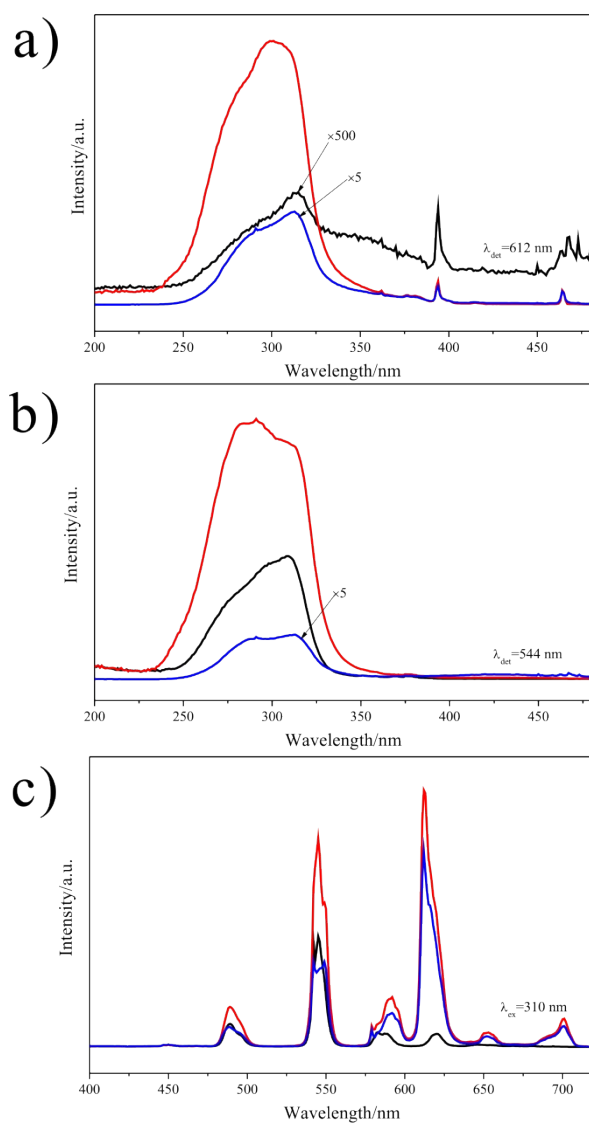


Figure S5. Excitation spectra of $\text{Eu}_4\text{Tb}_6(\text{acac})_n@NZL$ before (black line) and after exposure to $n\text{-BuNH}_2$ (red line), Benzylamine (blue line), a) monitored at 612 nm, b) monitored at 544 nm; c) Emission spectra of $\text{Eu}_4\text{Tb}_6(\text{acac})_n@NZL$ before (black line) and after exposure to $n\text{-BuNH}_2$ (red line), Benzylamine (blue line) excited at 310 nm.

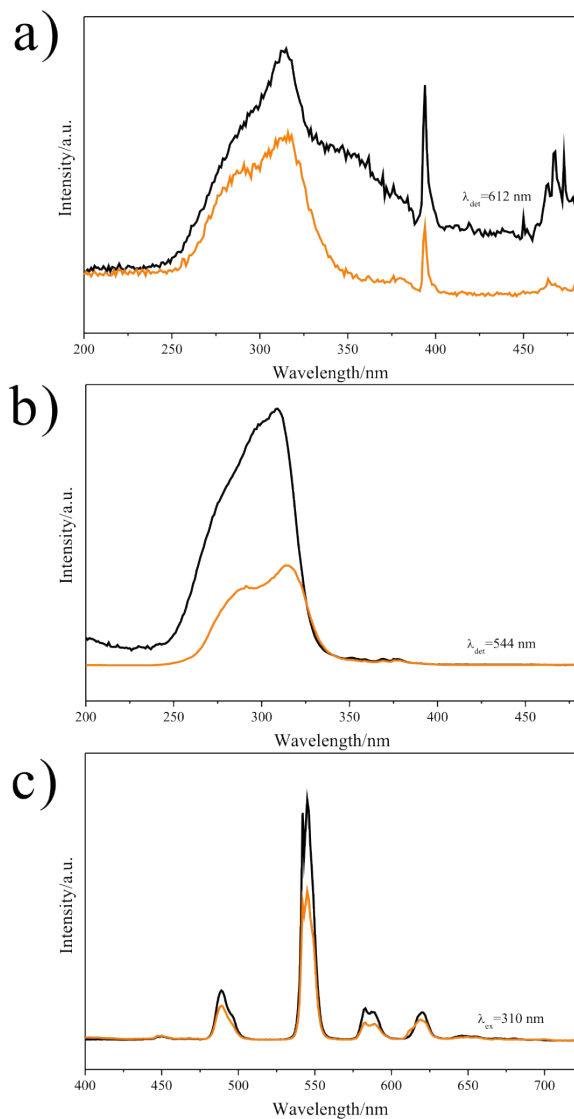


Figure S6. Excitation spectra of $\text{Eu}_4\text{Tb}_6(\text{acac})_n@NZL$ before (black line) and after exposure to N-methylaniline (orange line) a) monitored at 612 nm, b) monitored at 544 nm; c) Emission spectra of $\text{Eu}_4\text{Tb}_6(\text{acac})_n@NZL$ before (black line) and after exposure to N-methylaniline (orange line) excited at 310 nm.

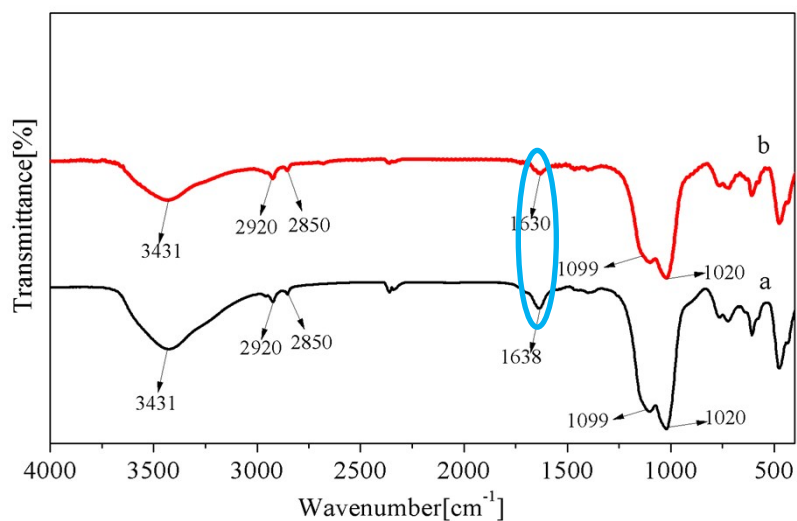


Figure S7. FTIR spectra of (a) $\text{Eu}_4\text{Tb}_6(\text{acac})_n@N\text{ZL}$ (black line), (b) $\text{Eu}_4\text{Tb}_6(\text{acac})_n@N\text{ZL}$ upon exposure to Et_3N (red line).

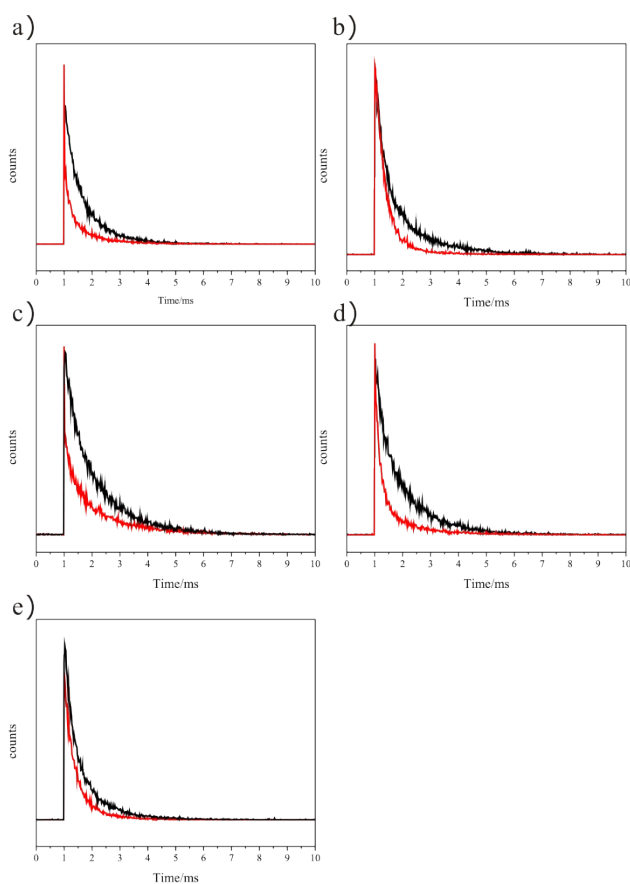


Figure S8. The compared decay curves of $\text{Tb}^{3+}(\text{acac})_n@N\text{ZL}$ (black line) and $\text{Eu}_4\text{Tb}_6(\text{acac})_n@N\text{ZL}$ (red line) using an excitation of 310 nm and monitored at 544 nm upon exposure to a) Et_3N , b) $n\text{-BuNH}_2$, c) Benzylamine, d) $t\text{-BuNH}_2$ and e) En vapor.

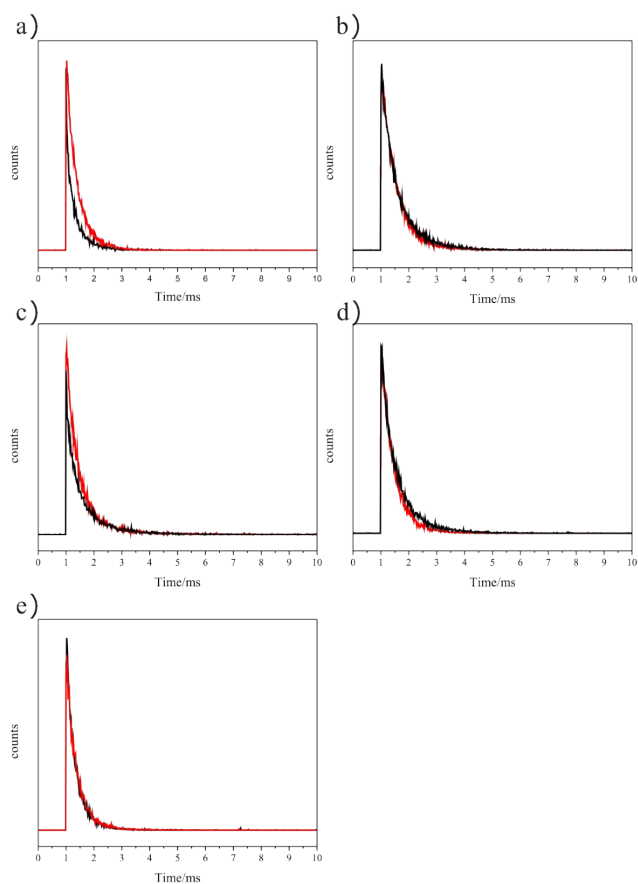


Figure S9. The compared decay curves of $\text{Eu}^{3+}(\text{acac})_n@NZL$ (black line) and $\text{Eu}_4\text{Tb}_6(\text{acac})_n@NZL$ (red line) using an excitation of 310 nm and monitored at 612 nm upon exposure to a) Et_3N , b) $n\text{-BuNH}_2$, c) Benzylamine, d) $t\text{-BuNH}_2$ and e) En vapor.

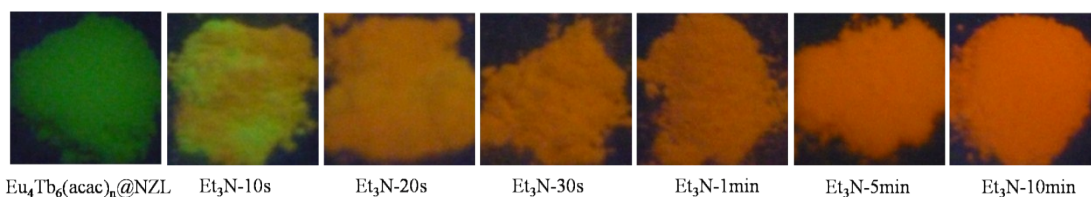


Figure S10. Digital photographs of $\text{Eu}_4\text{Tb}_6(\text{acac})_n@NZL$ upon contact with the equilibrated vapor of Et_3N for varied periods of time under near UV irradiation at 302 nm.

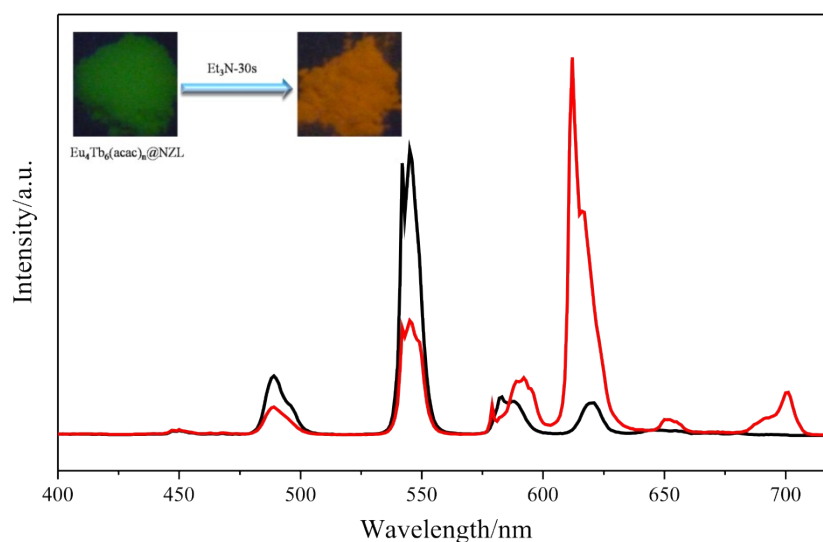


Figure S11. Emission spectrum of $\text{Eu}_4\text{Tb}_6(\text{acac})_n@NZL$ upon contact with the equilibrated vapor of Et_3N for 30 s; Inset: Digital photographs of $\text{Eu}_4\text{Tb}_6(\text{acac})_n@NZL$ upon contact with the equilibrated vapor of Et_3N for 30 s under near UV irradiation at 302 nm.

Table S1. The equilibrated vapor pressure of amine solvents.

	Et_3N	t-BuNH ₂	n-BuNH ₂	En	Benzylamine	N-methylaniline	aniline
Equilibrated vapor pressure(KPa)	9.06	49.54	12.29	1.65	0.09	0.06	0.09