Electronic Supplementary Material (ESI) for CrystEngComm.

Supplementary Information

Synthesis and multifunctional sensing of axially chiral tetranuclear europium clusters

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Chemical sensing

The fluorescence quenching was analyzed using the Stern-Volmer equations:

$$\mathbf{I_0/I = K_{sv}[Q]}$$

where I_0 and I are the fluorescence intensity without analyte and after the addition of analyte, respectively, $\boldsymbol{K_{sv}}$ is the Stern-Volmer quenching constant and [Q] is the concentration of analyte. The quenching percentage was calculated using the equation as follows:

Fluorescence quenching % = $(1 - I/I_0) \times 100$ %

where I_0 and I are the fluorescence intensity without analyte and after the addition of analyte.

The limit of detection concentration (LOD) was calculated according to the formula:

$$\mathbf{LOD = 3\delta/K_{sv}.}$$

and $\boldsymbol{\delta}$ is the standard deviation of the detection method.

Results and Discussion

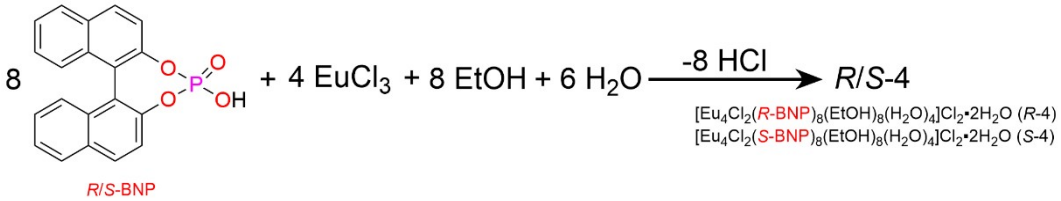

Fig. S1 Synthesis and chiral transfer processes of ***R*-4** and ***S*-4**.

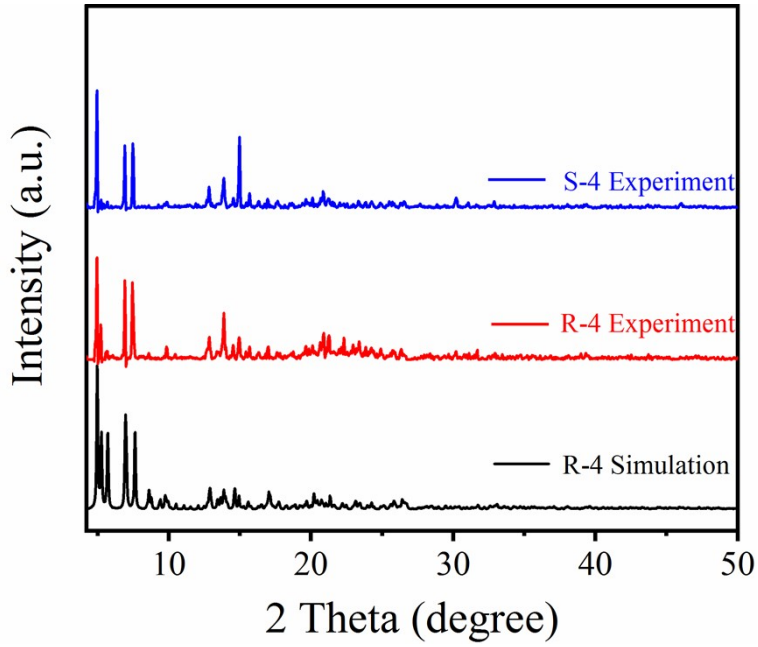

Fig. S2 Simulated and experimentally measured PXRD of ***R*-4** and ***S*-4**.

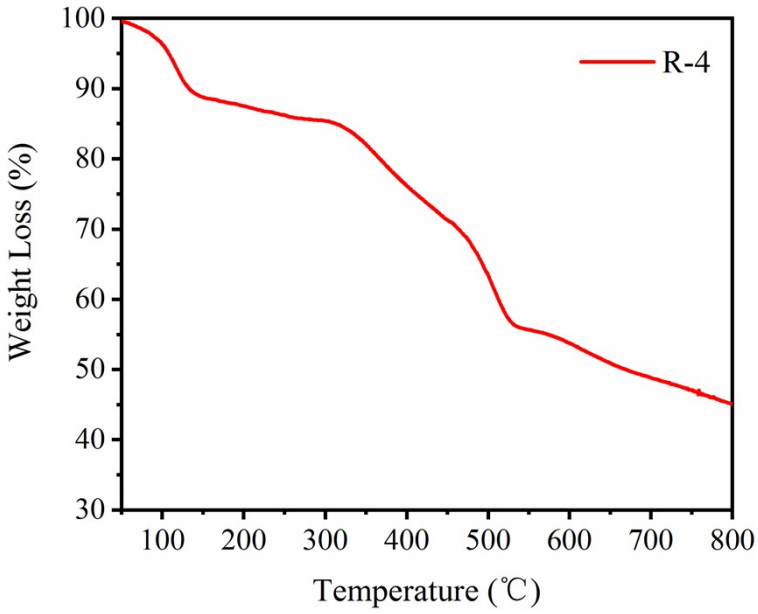

Fig. S3 Thermogravimetric analysis of ***R*-4** in nitrogen atmosphere.

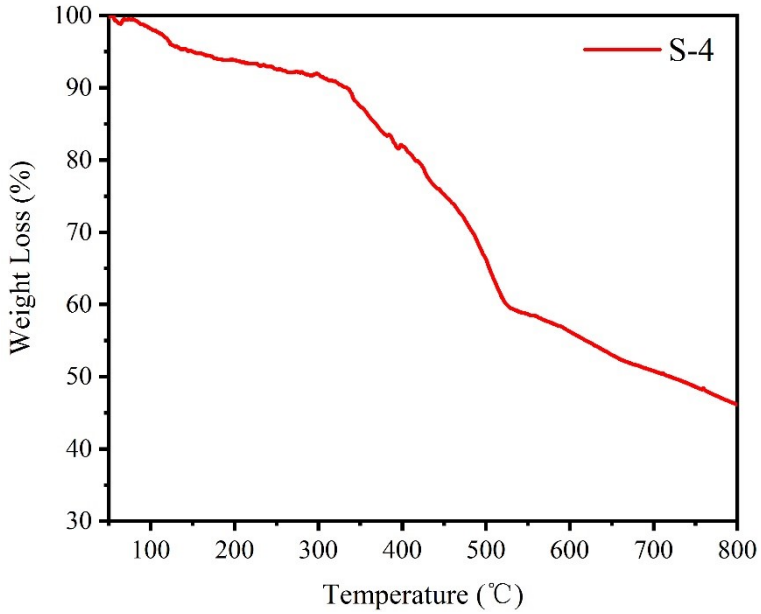

Fig. S4 Thermogravimetric analysis of ***S*-4** in nitrogen atmosphere.

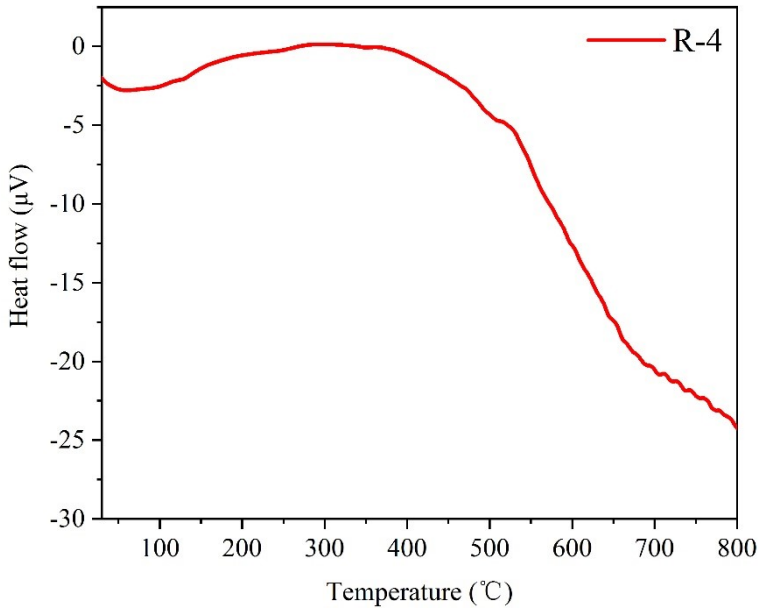

Fig. S5 DTA of ***R*-4** in nitrogen atmosphere.

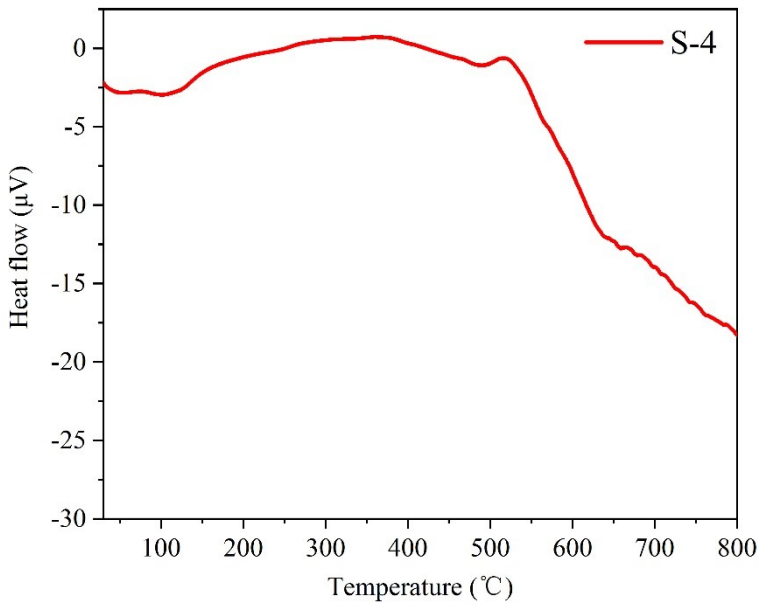

Fig. S6 DTA of ***S*-4** in nitrogen atmosphere.

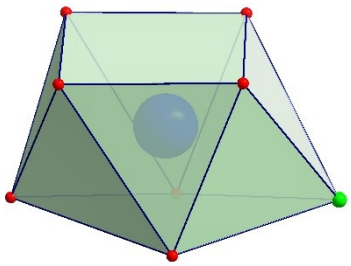

Fig. S7 The coordination mode of Eu^{3+} ions in ***R*-4**.

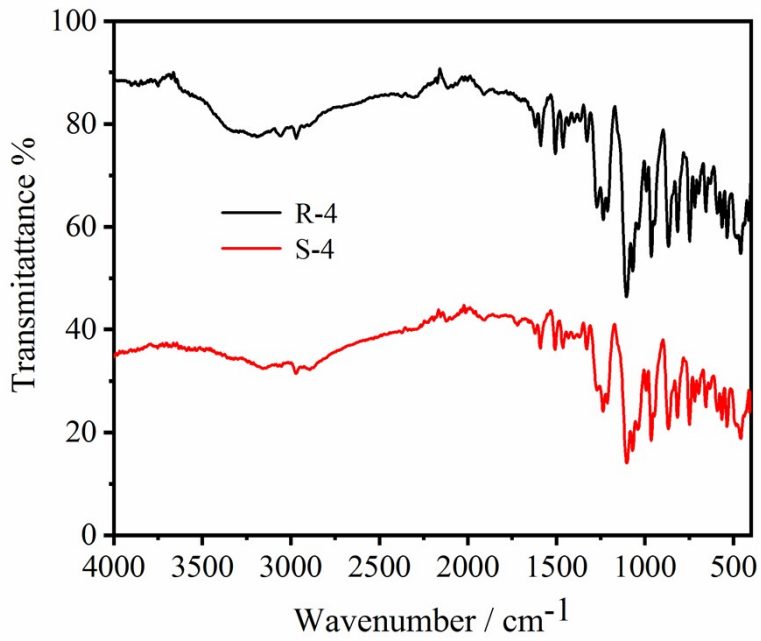

Fig. S8 FTIR spectrum (KBr pellets) of ***R*-4** and ***S*-4**.

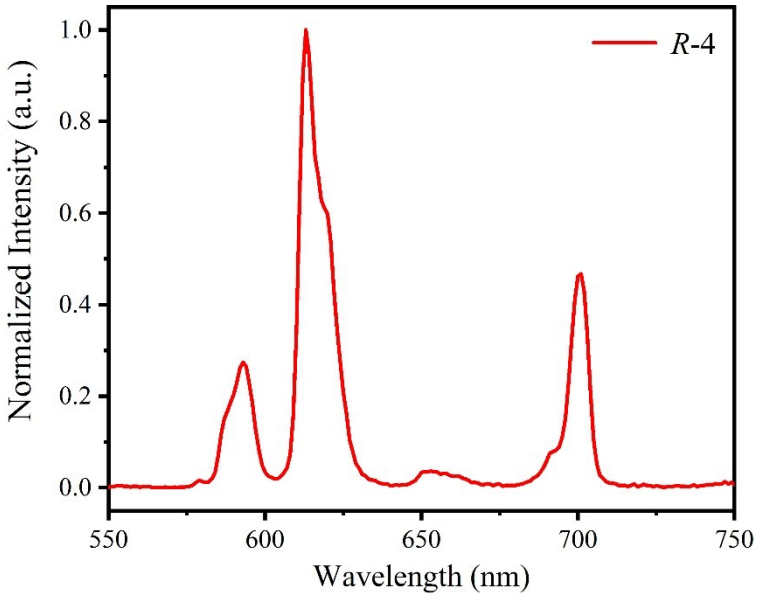

Fig. S9 The emission spectra of ***R*-4** (λ_{ex}=323 nm).

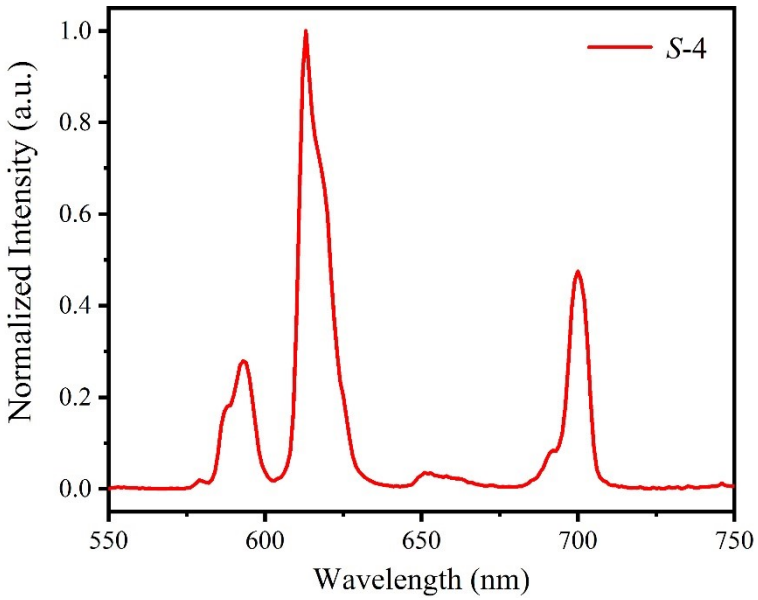

Fig. S10 The emission spectra of ***S*-4** (λ_{ex}=323 nm).

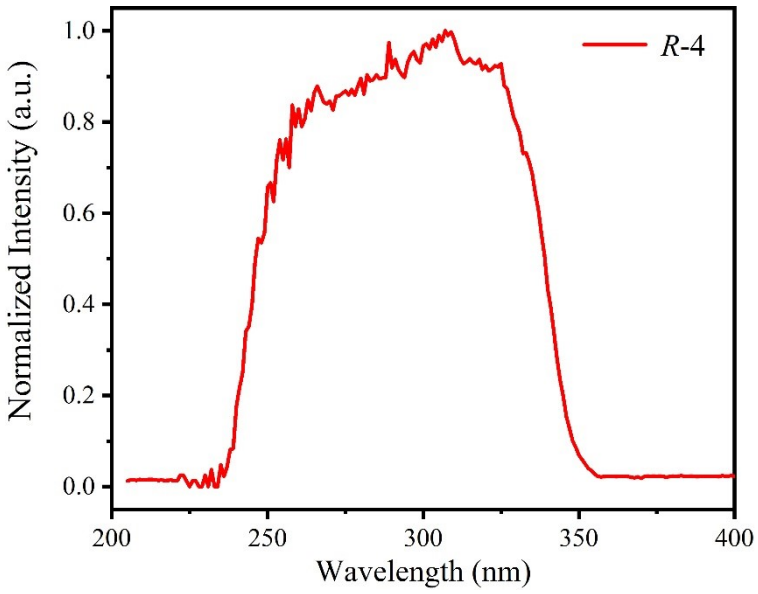

Fig. S11 The excitation spectra of ***R*-4**.

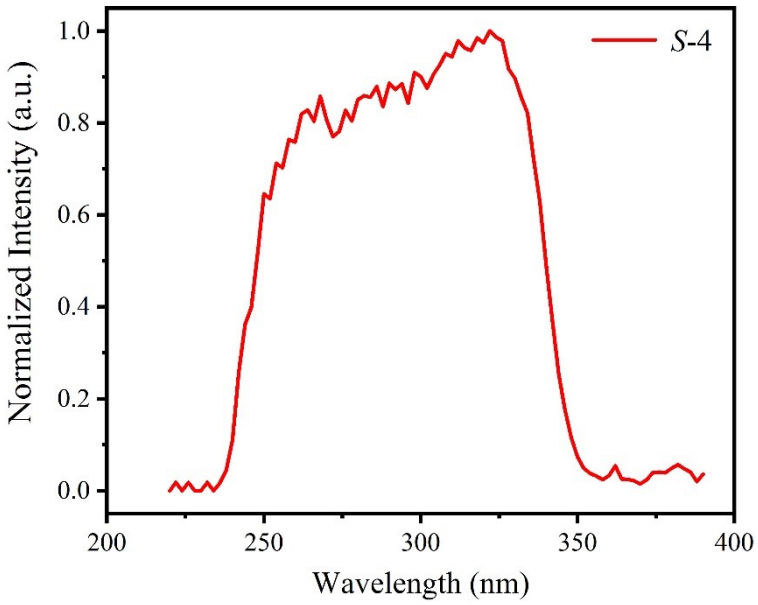

Fig. S12 The excitation spectra of ***S*-4**.

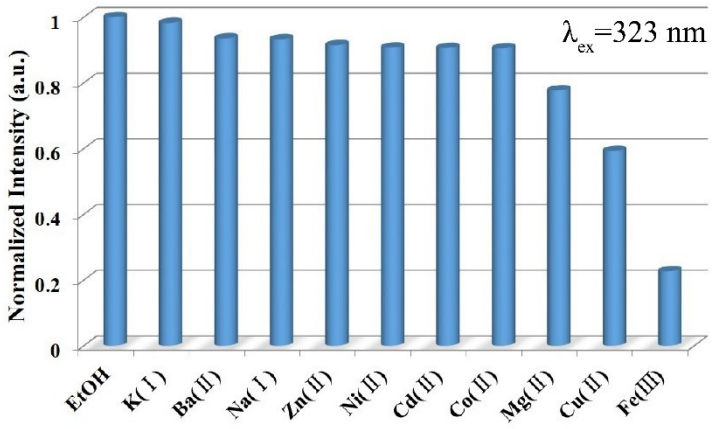

Fig. S13 Fluorescence response of ***R*-4** to different metal cations.

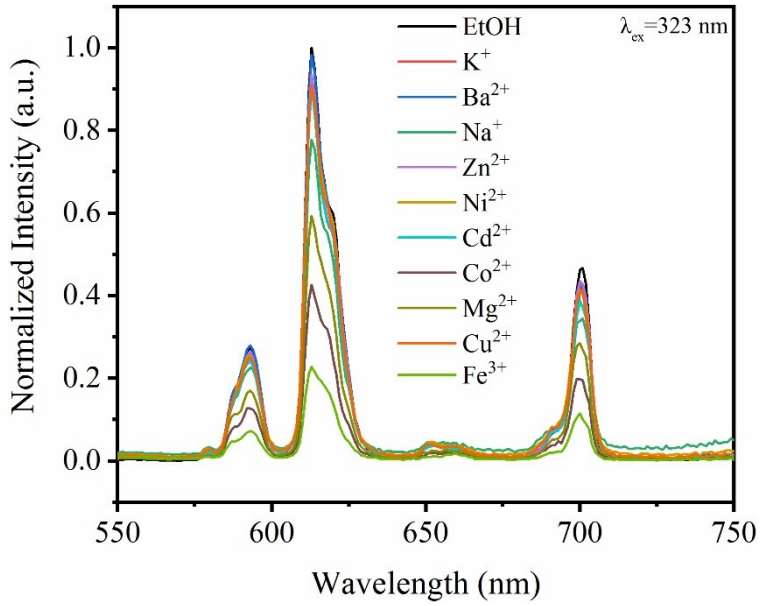

Fig. S14 Fluorescence spectra of ***R*-4** in different metal cation solutions.

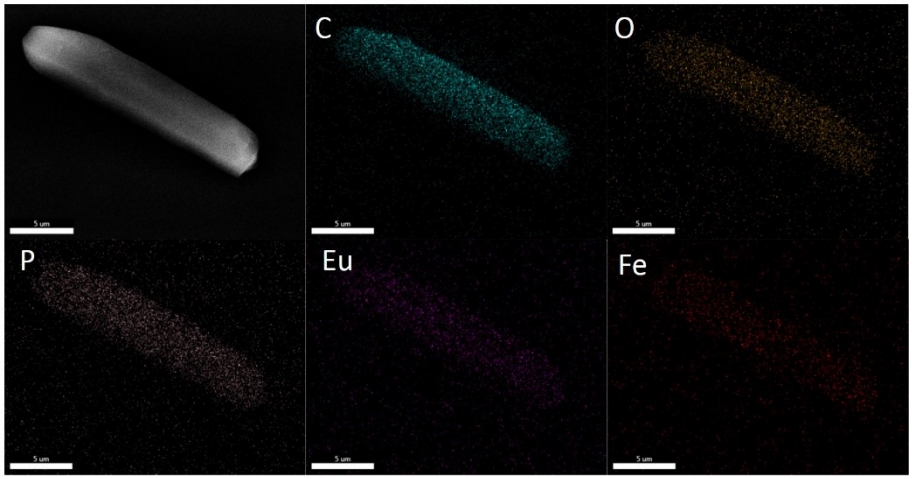

Fig. S15 TSM and mapping of ***R*-4** after adsorption of Fe^{3+} ions.

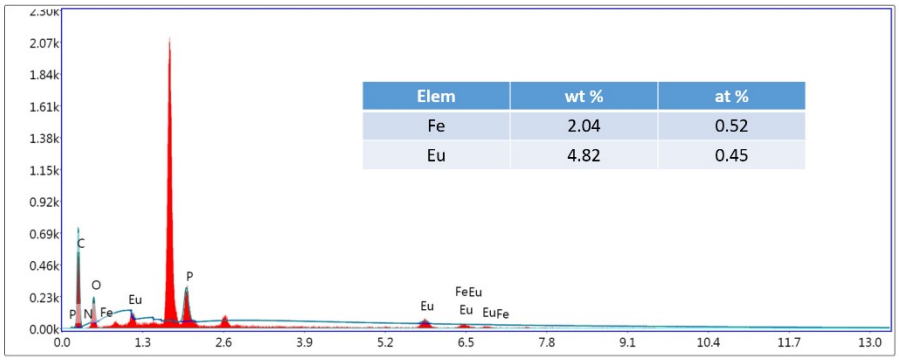

Fig. S16 EDS of ***R*-4** after adsorption of Fe^{3+} ions.

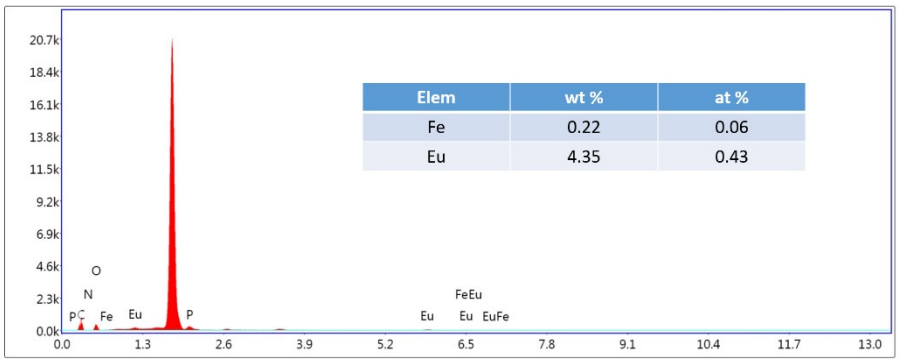

Fig. S17 EDS of ***R*-4** after adsorption of Fe^{3+} ions and washing.

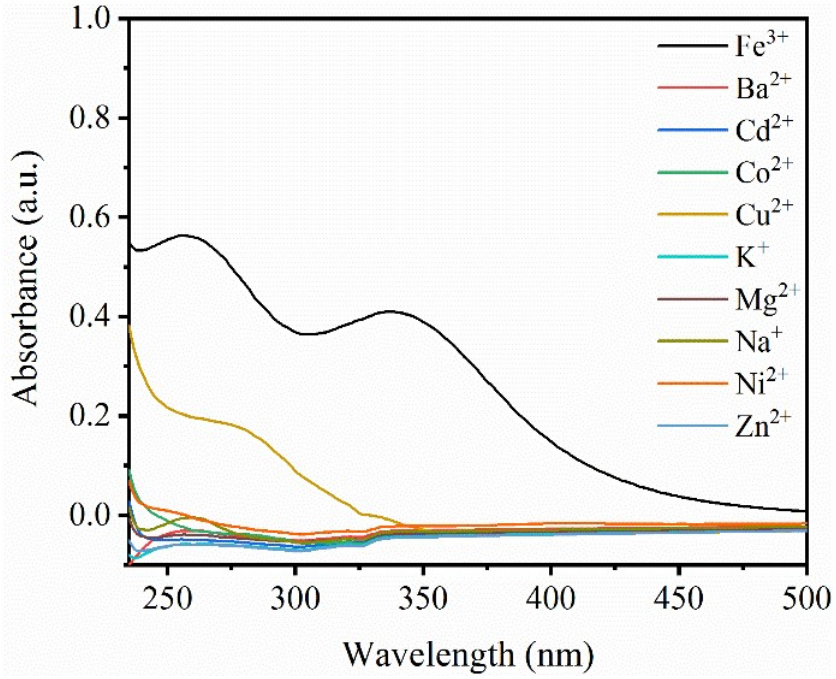

Fig. S18 UV absorption spectra of metal cations in ethanol.

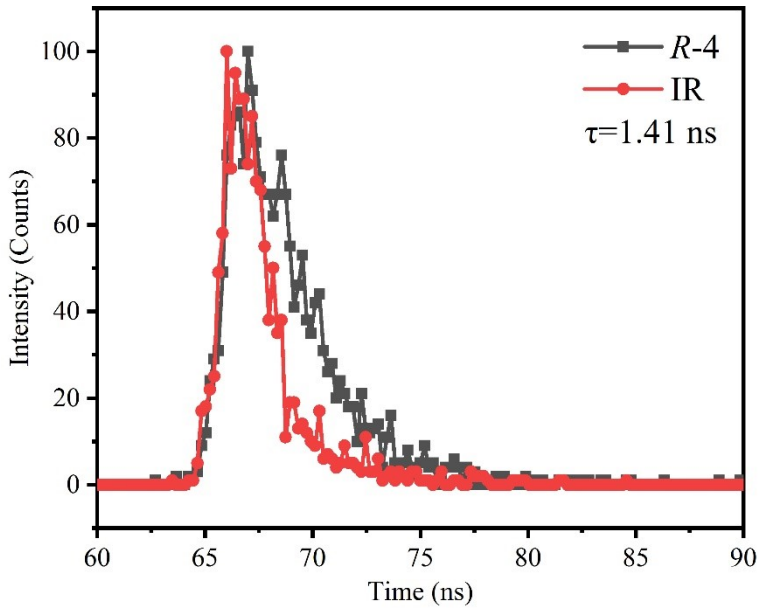

Fig. S19 Lifetime decay curves of ***R*-4** (λ_{ex}=323 nm).

Table S1. The Crystallographic data for **R-4** and **S-4**.

Compound	**R-4**	**S-4**
Empirical formula	$C_{176}H_{158}Cl_4Eu_4O_{51}P_8$	$C_{176}H_{158}Cl_4Eu_4O_{51}P_8$
Formula weight	4086.41	4086.41
Temperature/K	286.02	295.0
Crystal system	Triclinic	Triclinic
Space group	P1	P1
a/Å	13.7446(5)	13.7311(9)
b/Å	18.4533(7)	18.3631(12)
c/Å	20.1499(7)	20.1893(13)
α/°	108.815(2)	108.665(3)
β/°	107.500(2)	107.697(3)
γ/°	97.438(2)	97.375(3)
Volume/Å^3	4466.2(3)	4448.8(5)
Z	1	1
ρ_{calc}g/cm^3	1.378	1.427
μ/mm^{-1}	11.457	11.519
F(000)	1848.0	1917.0
Radiation	Cu Kα	Cu Kα
	(λ = 1.54178)	(λ = 1.54178)
Reflections collected	40098	63762
Independent reflections	13294	13352
Data/restraints/parameters	13294/5207/1992	13352/5225/2024
Goodness-of-fit on F^2	1.036	1.024
Final R indexes	R_1 = 0.0772,	R_1 = 0.0813,
[I>=2σ (I)]	wR_2 = 0.1878	wR_2 = 0.1808
Final R indexes	R_1 = 0.1067,	R_1 = 0.1078,
[all data]	wR_2 = 0.2071	wR_2 = 0.1985
Largest diff. peak/hole/eÅ^{-3}	0.84/-1.09	1.84/-0.80
Flack parameter	0.153(6)	0.171(5)