Supplementary Information (SI) for CrystEngComm.
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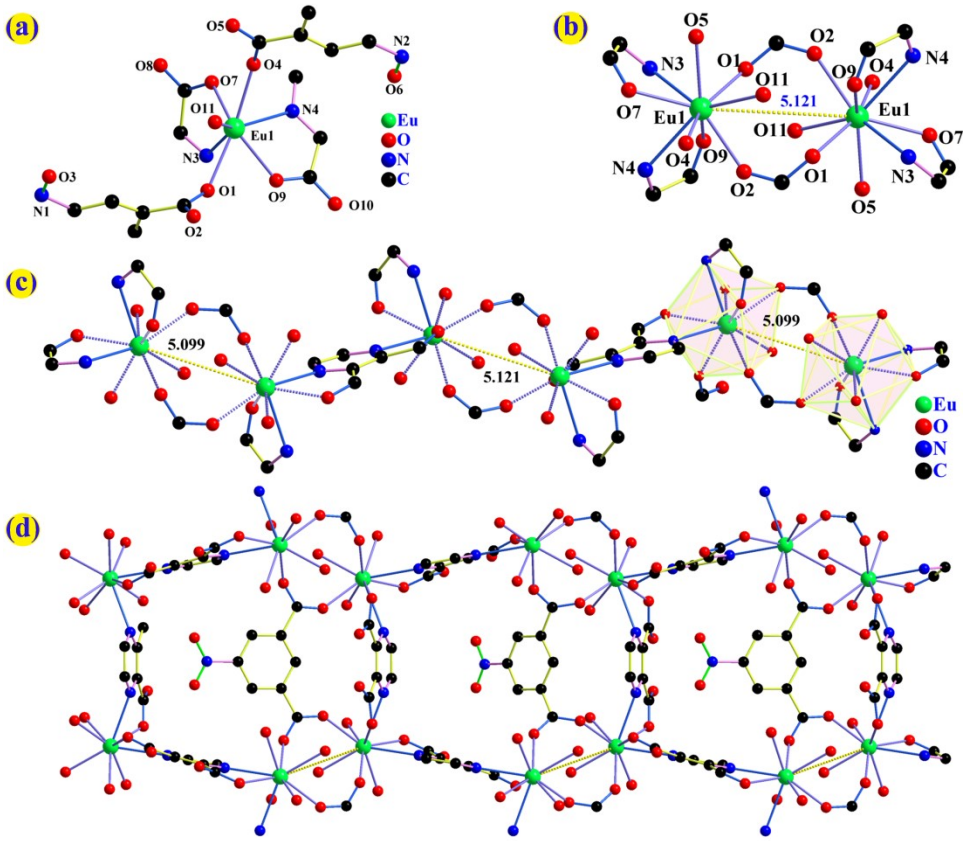

Figure S1. Crystal structure of **Cj-3**: (a) asymmetric unit; (b) dinuclear $Eu_2N_2O_{14}$ SBU; (c) representation of zig-zag rod shaped linear extension of paddle shaped SBU; (d) 2D extension of SBUs.

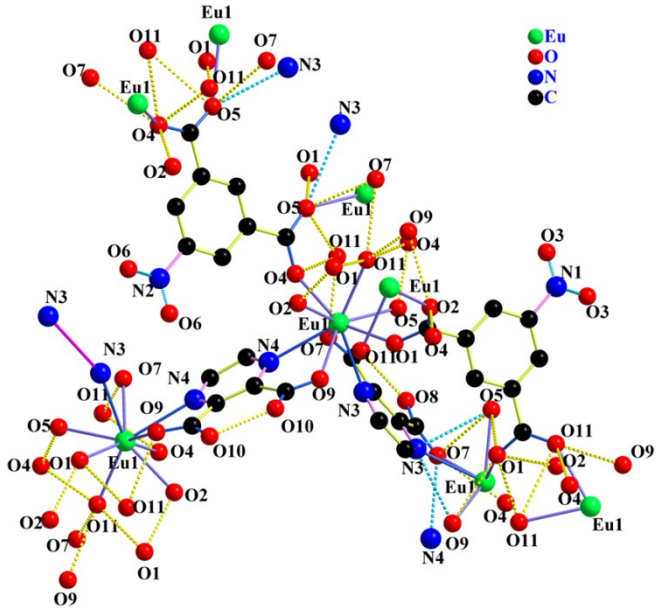

Figure S2. Hydrogen bonding positions in Cj-3

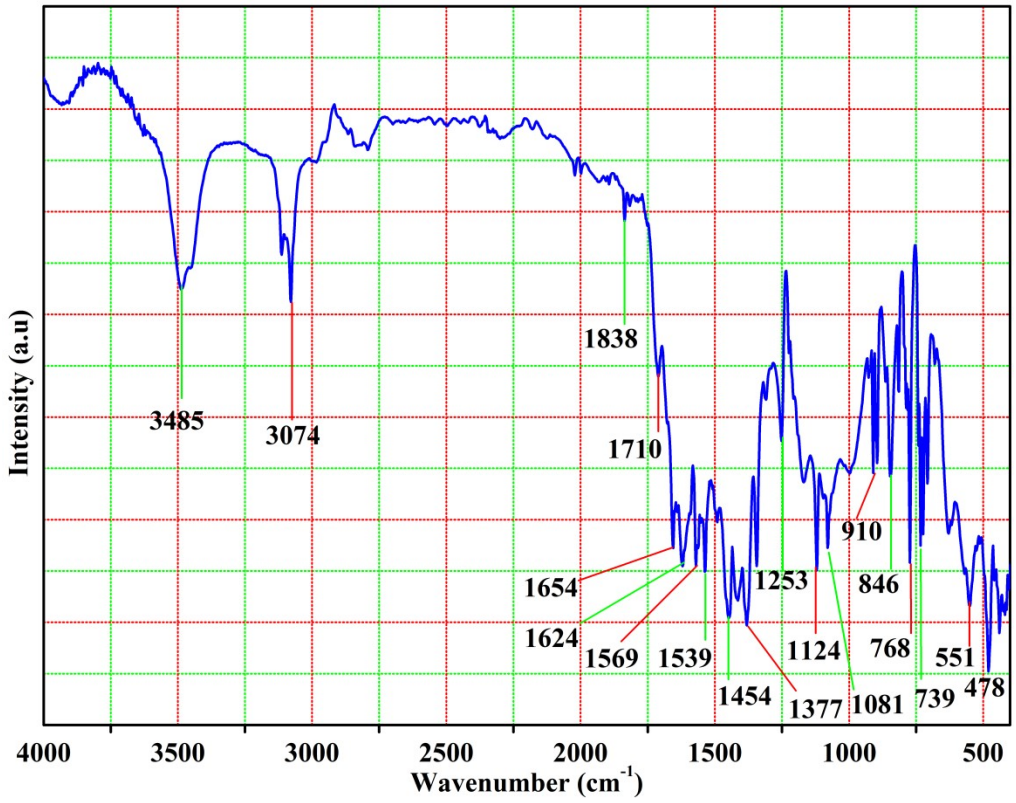

Figure S3. FTIR spectrum of **Cj-3**.

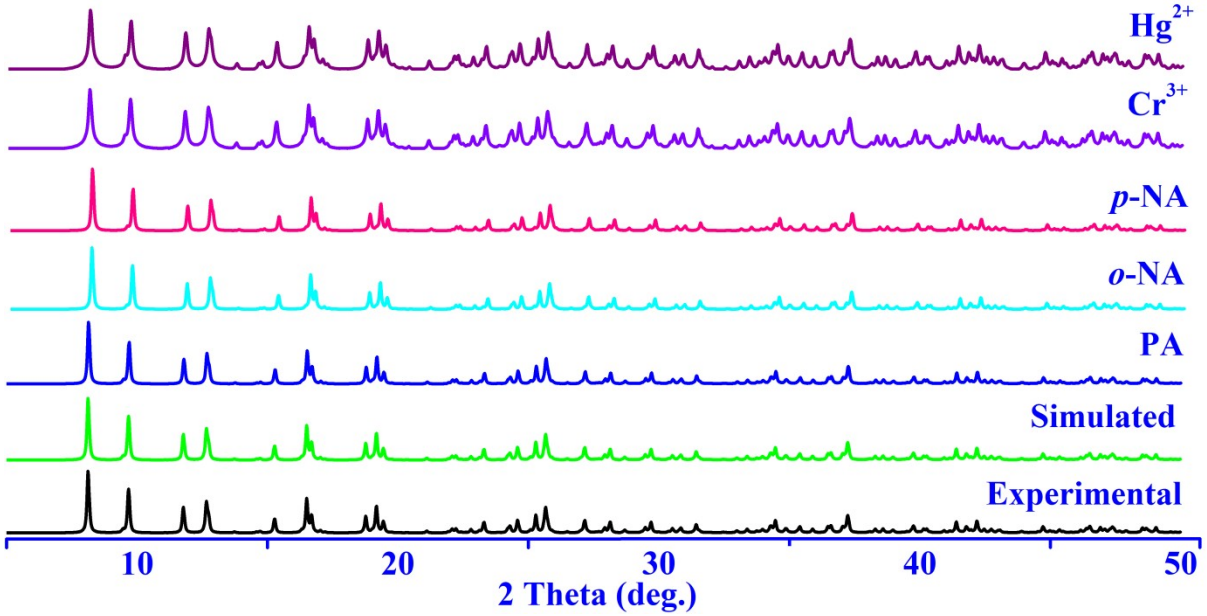

Figure S4. Experimental and simulated PXRD Patterns of **Cj-3**, along with the PXRD response of recycled **Cj-3** after addition of PA, *p*-NA, *o*-NA, Hg^{2+} and Cr^{3+}.

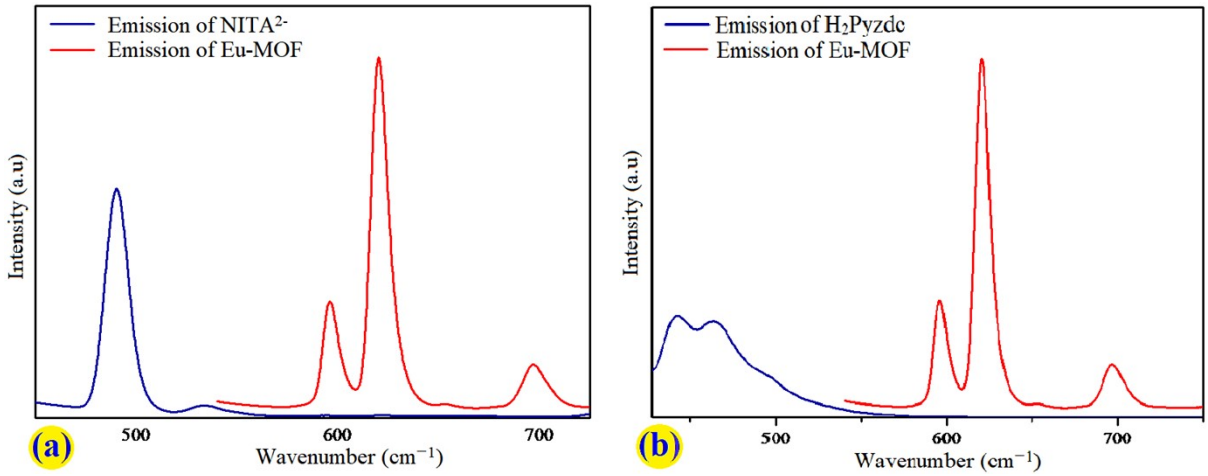

Figure S5. Emission spectra of Eu-MOF and ligands; (a) Nitroisopthalic acid and (b) 2,3 Pyrazine dicarboxylic acid.

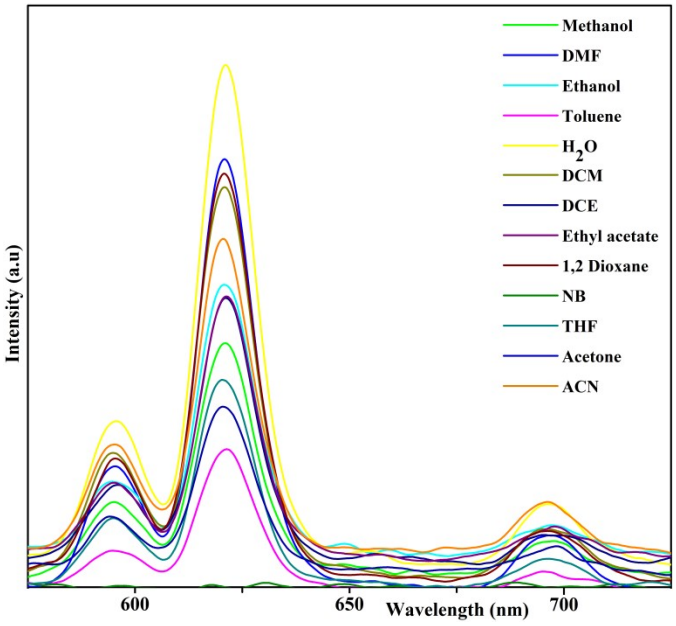

Figure S6. Emission spectra of **Cj-3** in different solvents.

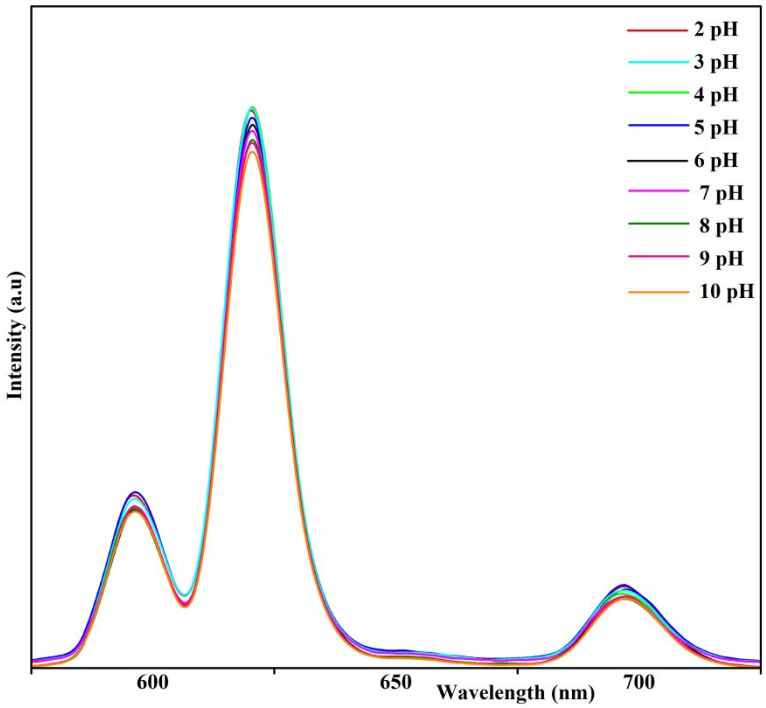

Figure S7. Effect of pH on the emission spectra of **Cj-3**

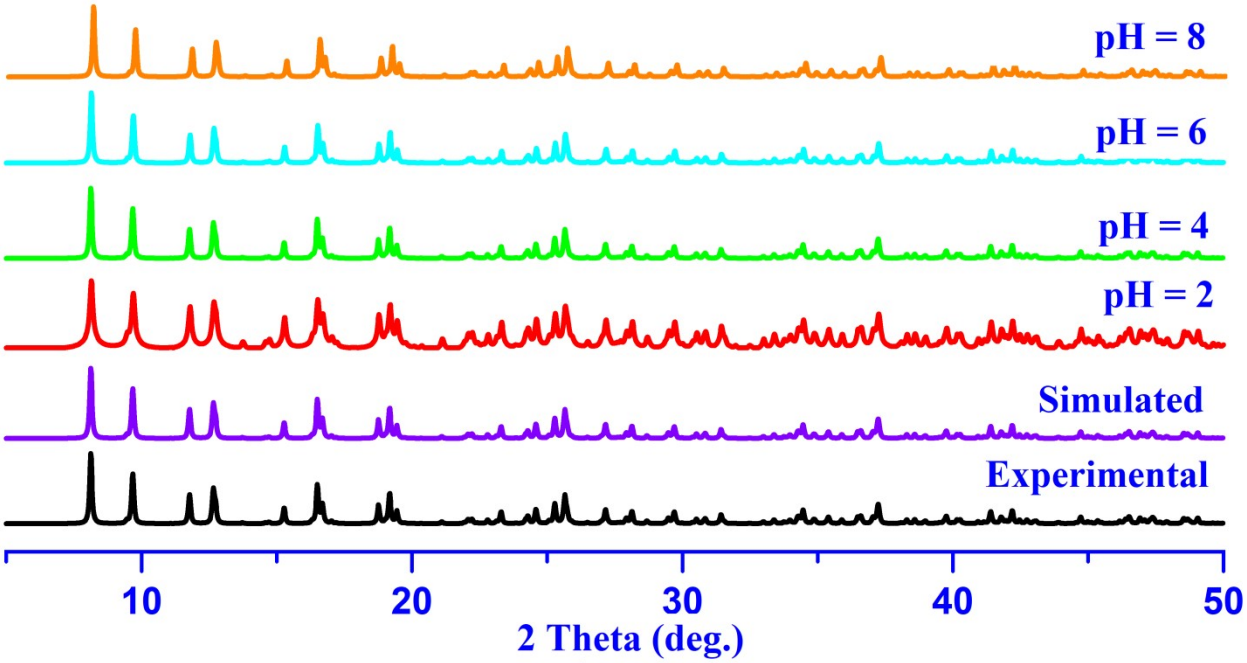

Figure S8. PXRD response of **Cj-3** at different pH (2-8)

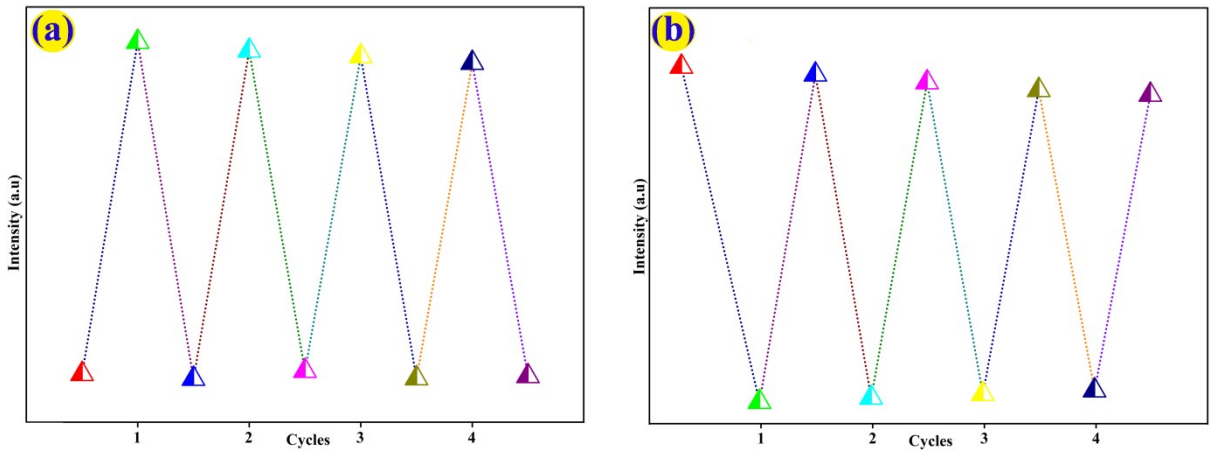

Figure S9: Recyclability of **Cj-3** after four cycles of sensing for *p*-NA and *o*-NA

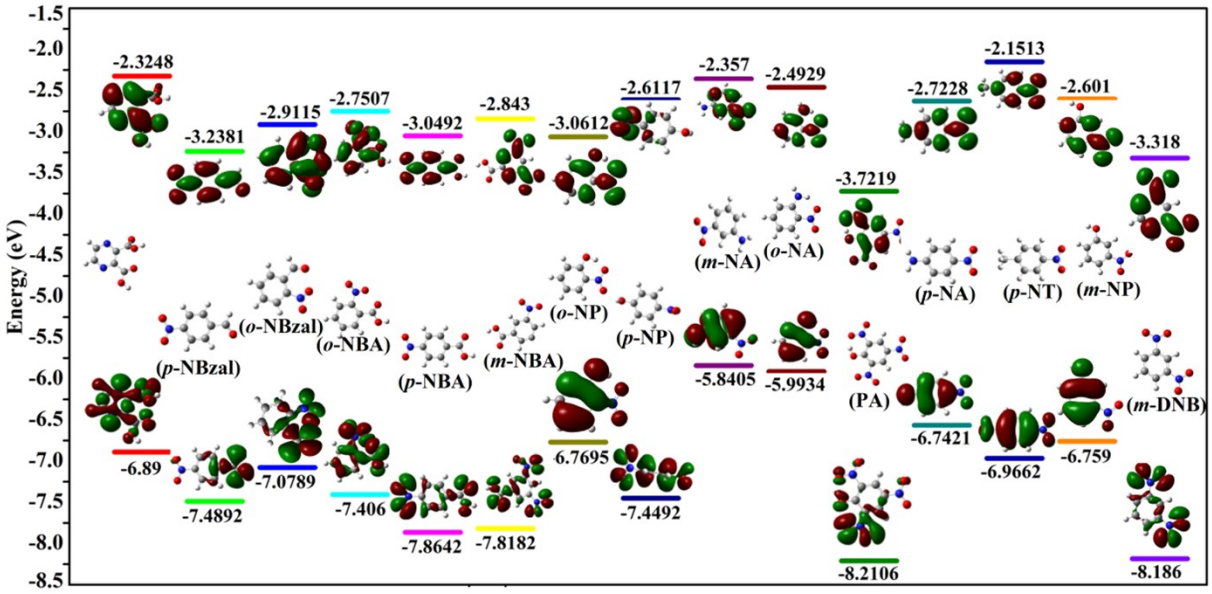

Figure S10: Energy profile diagram of the 2, 3 Pyzdc ligand and NACs with calculated HOMO and LUMO energies by DFT.

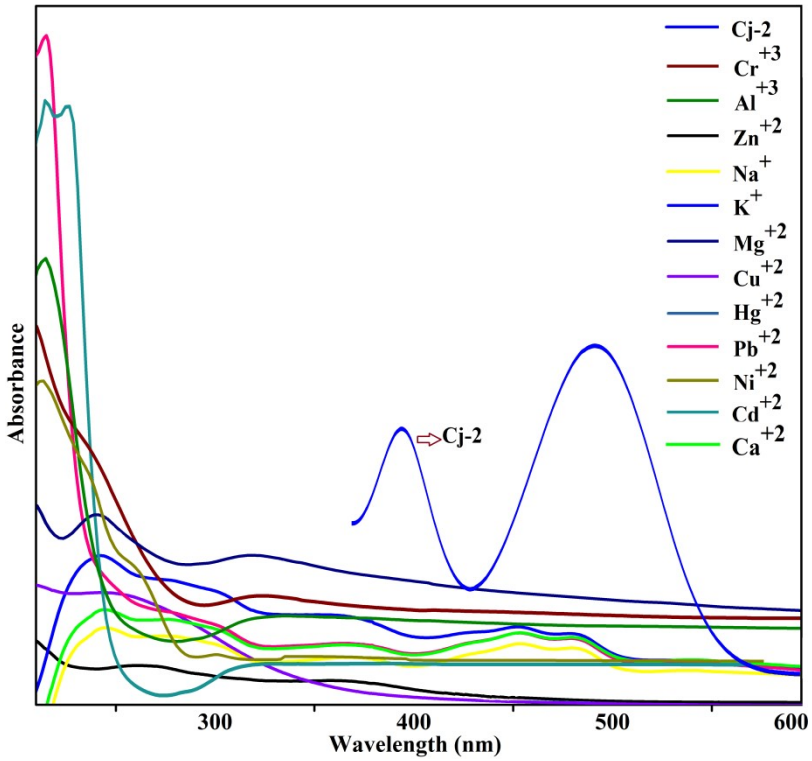

Figure S11. UV-Vis Absorption spectra of different metals ions and excitation spectra of **Cj-3**

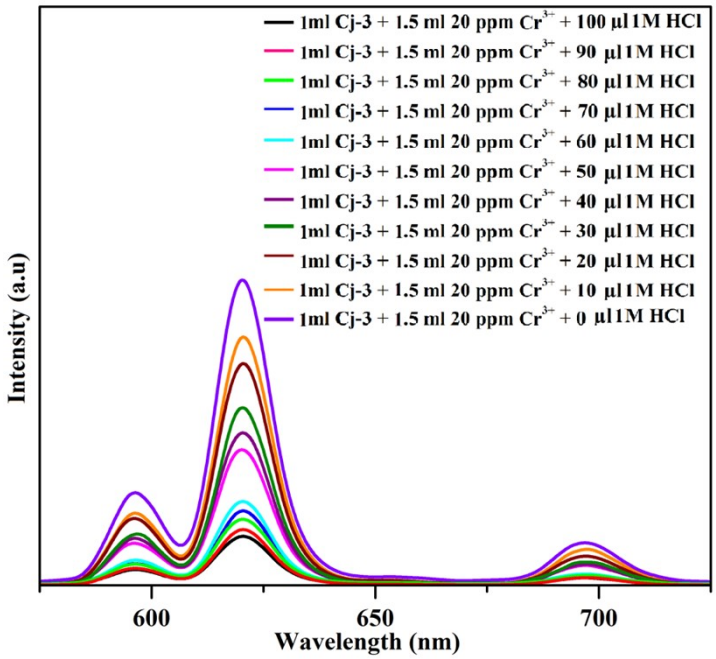

Figure S12. Variation in luminescence intensity of **Cj-3** upon incremental addition of Cr^{3+} ions dispersed in aqueous solutions with 1M HCl (0 µl -100 µl).

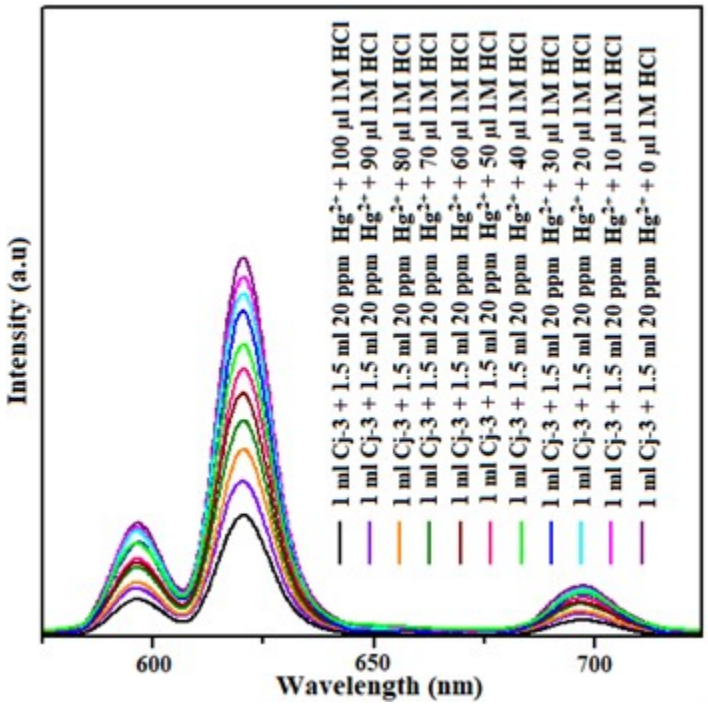

Figure S13. Variation in luminescence intensity of **Cj-3** upon incremental addition of Hg^{2+} ions dispersed in aqueous solutions with 1M HCl (0 µl -100 µl).

Crystallographic Information (Tables)

Table S1: Crystal data for Cj-3

Crystal data	Cj-3
Empirical formula	$C_{14}H_8EuN_3O_{11}$
CCDC	2356631
Formula weight	546.20
Crystal system space group	orthorhombic Pbcm
Temperature (K)	293
a(Å) *b*(Å) *c*(Å)	7.9885(4) 21.6907(12) 18.2297(10)
α(deg°) β (deg °) γ (deg °	90 90 90
*V*olume (Å^3)	33158.8(3)
Z	8
Radiation type	Mo Kα (λ = 0.71073)
μ (mm^{-1})	14.048
Crystal size (mm^3)	3.037 × 0.21 × 0.14
T_{min}, T_{max}	0.300, 1.000
Reflections collected	27445
R_{int}	0.1207
Data/restraints/parameters	2859/0/272
$R[F^2> 2\sigma(F^2)]$, $wR(F^2)$, S	0.0400, 0.0977, 1.05
$\Delta\rho_{max}$, $\Delta\rho_{min}$ (e Å^{-3}) Goodness-of-fit on F^2 F(000)	1.76, −2.01 1.052 2113.2

Table S2: Hydrogen-bond geometry (Å, °) for Cj-3

Type	Donor --- H....Acceptor	D - H	H...A	D...A	D - H...A
Intra	O8-H8 ...O8^{i}	0.82	1.58	2.399(5)	176
Intra	O11-H11A…O4^{ii}	0.85	2.12	2.919(4)	157
Intra	O11-H11A...O5^{ii}	0.85	2.52	2.863(5)	105
Intra	O11-H11A...O7^{ii}	0.85	2.4	2.868(5)	115
Intra	O11-H11B...O2	0.85	2.53	3.310(4)	153
Intra	O11-H11B...O1^{iii}	0.85	2.47	2.786(4)	103
Intra	O11-H11B...O9^{iii}	0.85	2.25	2.944(5)	139
	C13-H13...O8^{iv}	0.93	2.52	3.364(6)	150
Intra	C13-H13...O9	0.93	2.36	2.931(6)	120
Intra	C16-H16...O7	0.93	2.43	2.936(6)	114
	C16-H16...O10^{v}	0.93	2.54	3.377(6)	150

Symmetry code(s): (i)x, y,3/2-z (ii) 1-x,1-y,1-z (iii) -x,1-y,1-z (iv) -1+x, y, z (v) 1+x, y, z

Table S3: Selected geometric parameters (Å) for Cj-3

Eu1—O9	2.450 (3)	Eu1—O5^{ii}	2.417 (3)
Eu1—O11	2.425 (4)	Eu1—O1	2.380 (3)
Eu1—O4	2.358 (3)	Eu1—N3	2.635 (4)
Eu1—O2^{i}	2.414 (3)	Eu1—N4	2.693 (4)
Eu1—O7	2.467 (3)		

Symmetry code(s): (i) −*x*, −*y*+1, −*z*+1; (ii) −*x*+1, −*y*+1, −*z*+1; (iii) *x*, *y*, −*z*+1/2; (iv) *x*, *y*, −*z*+3/2; (v) *x*, −*y*+1/2, −*z*+1.

Table S4: Selected geometric parameters (º) for Cj-3

O11—Eu1—O9	**123.70 (10)**	**O1—Eu1—O2^{i}**	**94.20 (11)**
O4—Eu1—O9	**126.72 (11)**	**O1—Eu1—O7**	**127.18 (11)**
O4—Eu1—O11	**76.53 (12)**	**O1—Eu1—O5^{ii}**	**75.03 (11)**
O2^{i}—Eu1—O9	**66.12 (11)**	**N3—Eu1—O9**	**69.67 (11)**
O2^{i}—Eu1—O11	**73.83 (12)**	**N3—Eu1—O11**	**139.19 (13)**
O2^{i}—Eu1—O4	**76.71 (13)**	**N3—Eu1—O4**	**129.84 (11)**
O7—Eu1—O9	**113.67 (11)**	**N3—Eu1—O2^{i}**	**135.53 (11)**
O7—Eu1—O11	**122.62 (10)**	**N3—Eu1—O7**	**60.36 (10)**
O7—Eu1—O4	**70.57 (11)**	**N3—Eu1—O5^{ii}**	**73.16 (11)**
O7—Eu1—O2^{i}	**136.90 (11)**	**N3—Eu1—O1**	**74.22 (11)**
O5^{ii}—Eu1—O9	**133.78 (10)**	**N4—Eu1—O9**	**60.12 (11)**
O5^{ii}—Eu1—O11	**72.43 (12)**	**N4—Eu1—O11**	**142.66 (14)**
O5^{ii}—Eu1—O4	**98.14 (11)**	**N4—Eu1—O4**	**75.29 (12)**
O5^{ii}—Eu1—O2^{i}	**146.12 (11)**	**N4—Eu1—O2^{i}**	**76.23 (12)**
O5^{ii}—Eu1—O7	**67.51 (11)**	**N4—Eu1—O7**	**68.98 (11)**
O1—Eu1—O9	**69.24 (11)**	**N4—Eu1—O5^{ii}**	**135.59 (12)**
O1—Eu1—O11	**76.27 (11)**	**N4—Eu1—O1**	**128.05 (11)**
O1—Eu1—O4	**152.75 (11)**	**N4—Eu1—N3**	**78.15 (13)**

Symmetry code(s): (i) −*x*, −*y*+1, −*z*+1; (ii) −*x*+1, −*y*+1, −*z*+1; (iii) *x*, *y*, −*z*+1/2; (iv) *x*, *y*, −*z*+3/2; (v) *x*, −*y*+1/2, −*z*+1.