

<Electronic Supplementary Information (ESI) available>

Sandwich-shaped M_3L_2 zinc(II) complex containing 1,3,5-tris(dimethyl(pyridin-3-yl)silyl)benzene: Selective photoluminescence recognition of diiodomethane

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Table S1. Crystallographic data on $[\text{Zn}_3(\mu\text{-OH})_3\text{L}_2](\text{ClO}_4)_3 \cdot 4\text{CH}_3\text{CN} \cdot 2\text{H}_2\text{O}$

$[\text{Zn}_3(\mu\text{-OH})_3\text{L}_2](\text{ClO}_4)_3 \cdot 4\text{CH}_3\text{CN} \cdot 2\text{H}_2\text{O}$	
Formula	$\text{C}_{62}\text{H}_{83}\text{Cl}_3\text{N}_{10}\text{O}_{16}\text{Si}_6\text{Zn}_3$
M_w (g mol ⁻¹)	1695.38
Crystal system	Monoclinic
Space group	$P2_1/n$
a (Å)	20.8466(3)
b (Å)	16.4944(3)
c (Å)	23.9629(4)
β (°)	92.623(1)
V (Å ³)	8231.1(2)
σ (g cm ⁻³)	1.368
Z	4
μ (mm ⁻¹)	1.116
$F(000)$	3512
R_{int}	0.0895
Completeness (%)	100.0
GoF on F^2	1.012
$R_1 [I > 2\sigma(I)]^a$	0.0509
wR_2 (all data) ^b	0.1626

$$^a R_1 = \Sigma ||F_o| - |F_c|| / \Sigma |F_o|, ^b wR_2 = (\Sigma [w(F_o^2 - F_c^2)^2] / \Sigma [w(F_o^2)^2])^{1/2}$$

Table S2. Selected bond lengths (Å) and angles (°) of $[\text{Zn}_3(\mu\text{-OH})_3\text{L}_2](\text{ClO}_4)_3 \cdot 4\text{CH}_3\text{CN} \cdot 2\text{H}_2\text{O}$

$[\text{Zn}_3(\mu\text{-OH})_3\text{L}_2](\text{ClO}_4)_3 \cdot 4\text{CH}_3\text{CN} \cdot 2\text{H}_2\text{O}$	
Zn(1)–O(2)	1.899(3)
Zn(1)–O(1)	1.923(2)
Zn(1)–N(1)	2.023(3)
Zn(1)–N(4)	2.032(3)
Zn(2)–O(2)	1.907(3)
Zn(2)–O(3)	1.923(3)
Zn(2)–N(5)	2.023(3)
Zn(2)–N(2)	2.029(3)
Zn(3)–O(1)	1.908(2)
Zn(3)–O(3)	1.930(3)
Zn(3)–N(6)	2.024(3)
Zn(3)–N(3)	2.029(3)
O(2)–Zn(1)–O(1)	106.1(1)
O(2)–Zn(1)–N(1)	116.2(1)
O(1)–Zn(1)–N(1)	106.3(1)
O(2)–Zn(1)–N(4)	116.6(1)
O(1)–Zn(1)–N(4)	107.3(1)
N(1)–Zn(1)–N(4)	103.6(1)
O(2)–Zn(2)–O(3)	105.3(1)
O(2)–Zn(2)–N(5)	114.5(1)
O(3)–Zn(2)–N(5)	107.4(1)
O(2)–Zn(2)–N(2)	112.9(1)
O(3)–Zn(2)–N(2)	106.9(1)
N(5)–Zn(2)–N(2)	109.4(1)
O(1)–Zn(3)–O(3)	102.9(1)
O(1)–Zn(3)–N(6)	123.3(1)
O(3)–Zn(3)–N(6)	103.1(1)
O(1)–Zn(3)–N(3)	106.6(1)
O(3)–Zn(3)–N(3)	112.1(1)
N(6)–Zn(3)–N(3)	108.6(1)

Table S3. Fluorescence lifetime (ns) of $[\text{Zn}_3(\mu\text{-OH})_3\text{L}_2](\text{ClO}_4)_3 \cdot 4\text{CH}_3\text{CN} \cdot 2\text{H}_2\text{O}$ in presence of various CH_2I_2 concentrations, 0, 8.15×10^{-5} , and 1.62×10^{-4} mol/L in a methanol solution state at room temperature

$[\text{Q}] \times 10^5$	λ_{em}	τ_1	τ_2
0	410 nm	1.077	7.987
8.1	410 nm	0.429	5.845
16.2	410 nm	0.268	4.362

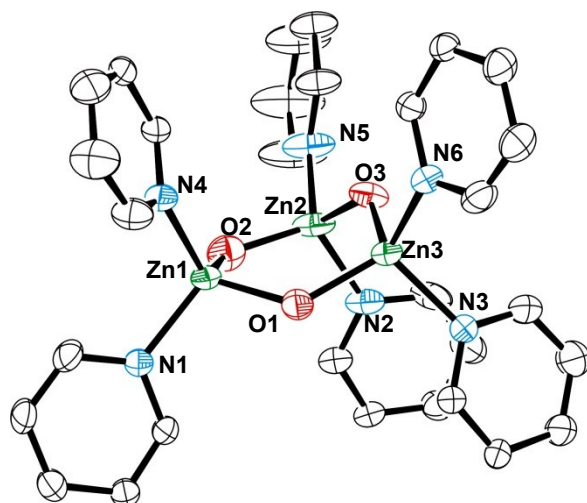


Fig. S1. ORTEP drawing showing local geometry of zinc(II) and 6-membered ring moiety of $[\text{Zn}_3(\mu\text{-OH})_3\text{L}_2](\text{ClO}_4)_3 \cdot 4\text{CH}_3\text{CN} \cdot 2\text{H}_2\text{O}$.

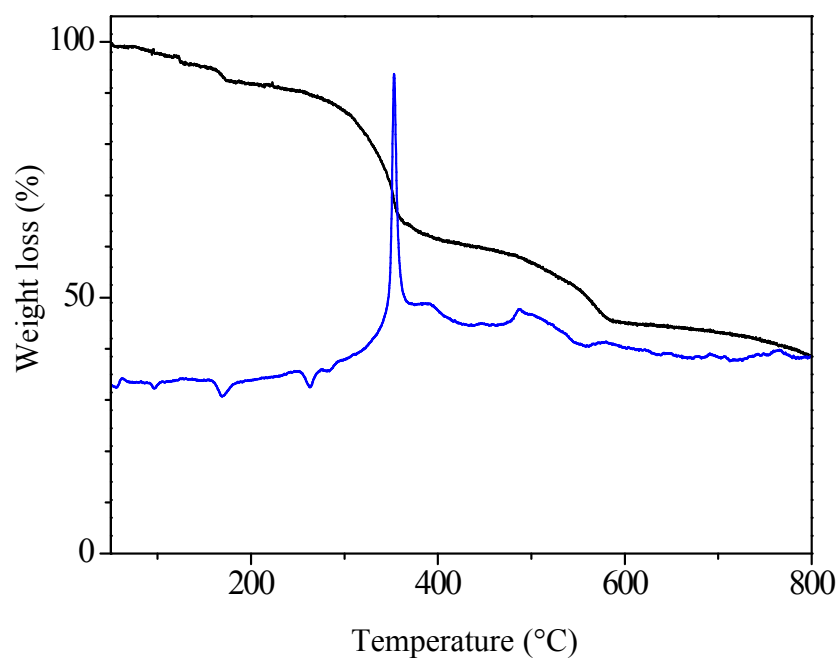


Fig. S2. TGA and DSC curves of $[\text{Zn}_3(\mu\text{-OH})_3\text{L}_2](\text{ClO}_4)_3 \cdot 4\text{CH}_3\text{CN} \cdot 2\text{H}_2\text{O}$. Weight loss for solvate molecules: Calc. 11.8 %, Found 10.8 %.

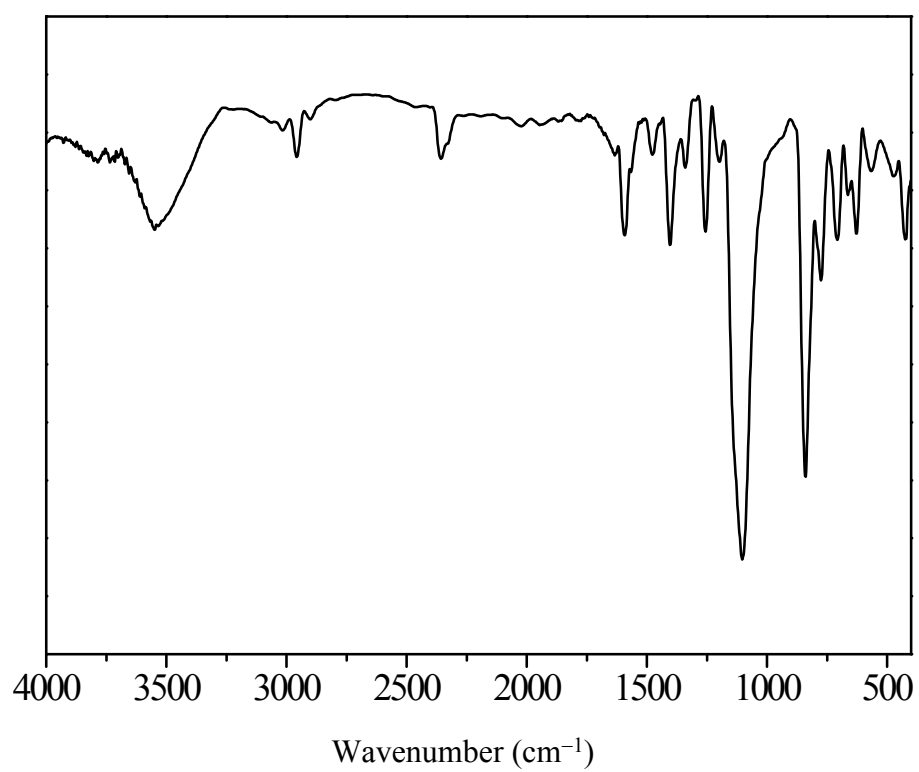


Fig. S3. FT-IR spectrum of $[\text{Zn}_3(\mu\text{-OH})_3\text{L}_2](\text{ClO}_4)_3 \cdot 4\text{CH}_3\text{CN} \cdot 2\text{H}_2\text{O}$.

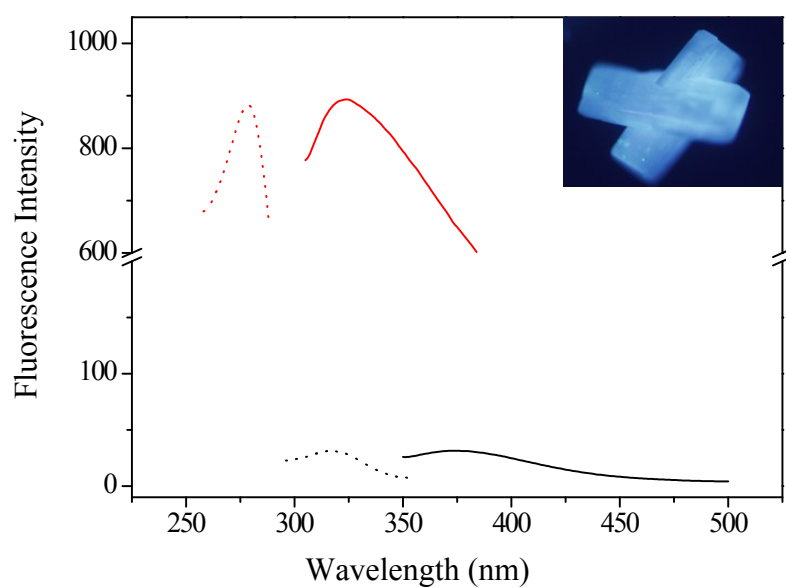


Fig. S4. Solid state fluorescence spectra of $[\text{Zn}_3(\mu\text{-OH})_3\text{L}_2](\text{ClO}_4)_3 \cdot 4\text{CH}_3\text{CN} \cdot 2\text{H}_2\text{O}$ (red line), $\lambda_{\text{ex}} = 275 \text{ nm}$, $\lambda_{\text{em}} = 324 \text{ nm}$; L (black line), $\lambda_{\text{ex}} = 317 \text{ nm}$, $\lambda_{\text{em}} = 373 \text{ nm}$; Inset: fluorescent-microscopic image of $[\text{Zn}_3(\mu\text{-OH})_3\text{L}_2](\text{ClO}_4)_3 \cdot 4\text{CH}_3\text{CN} \cdot 2\text{H}_2\text{O}$.

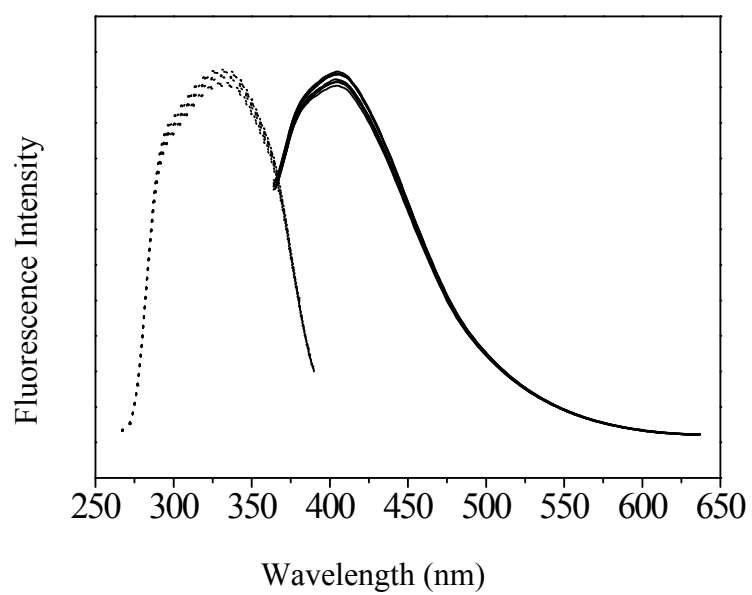


Fig. S5. Fluorescence excitation (dotted line) and emission (solid line) spectra of $[\text{Zn}_3(\mu\text{-OH})_3\text{L}_2](\text{ClO}_4)_3 \cdot 4\text{CH}_3\text{CN} \cdot 2\text{H}_2\text{O}$ in methanol solution in presence of various dichloromethane concentration (0 ; 5.22×10^{-4} ; 1.04×10^{-3} ; 1.57×10^{-3} ; 2.09×10^{-3} ; 2.61×10^{-3} ; 3.13×10^{-3} ; 3.65×10^{-3} ; 4.18×10^{-3} mol/L).

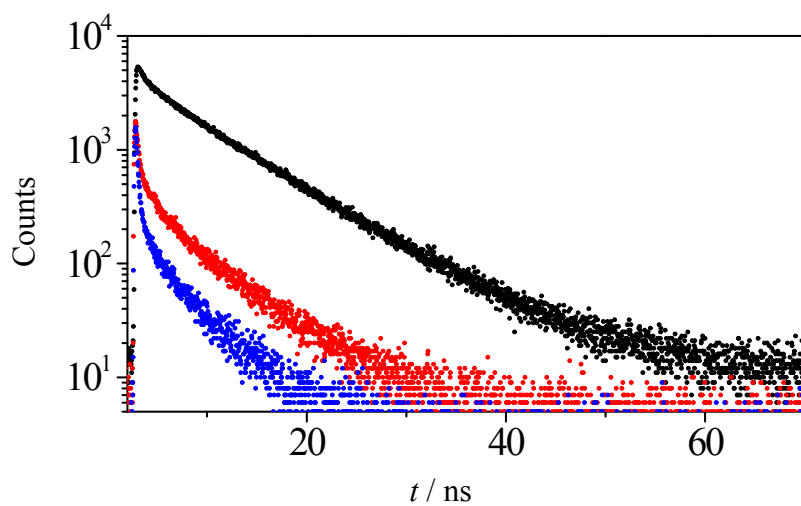


Fig. S6. Fluorescence lifetime decays following excitation at $\lambda = 375$ nm of $[\text{Zn}_3(\mu\text{-OH})_3\text{L}_2](\text{ClO}_4)_3 \cdot 4\text{CH}_3\text{CN} \cdot 2\text{H}_2\text{O}$ (monitored at $\lambda = 410$ nm) in presence of various CH_2I_2 concentrations, 0 (black), 8.15×10^{-5} (red), and 1.62×10^{-4} (blue) mol/L.

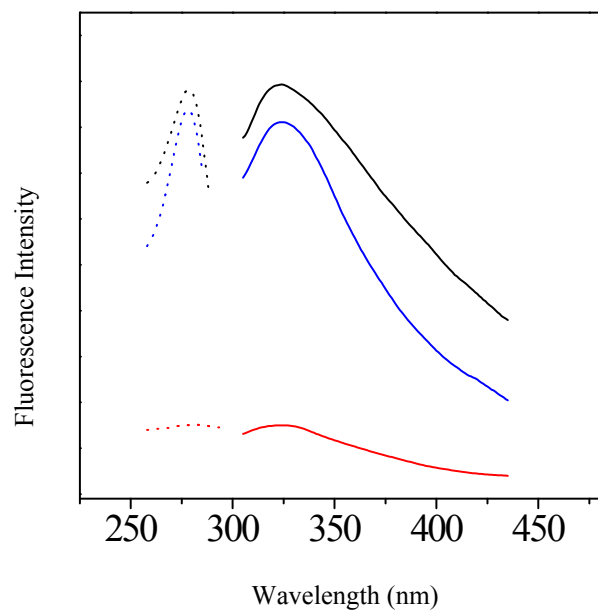


Fig. S7. Photoluminescence spectra in a solid state of $[\text{Zn}_3(\mu\text{-OH})_3\text{L}_2](\text{ClO}_4)_3 \cdot 4\text{CH}_3\text{CN} \cdot 2\text{H}_2\text{O}$ (black), after addition of CH_2I_2 (red), and after several washings with diethyl ether (blue).