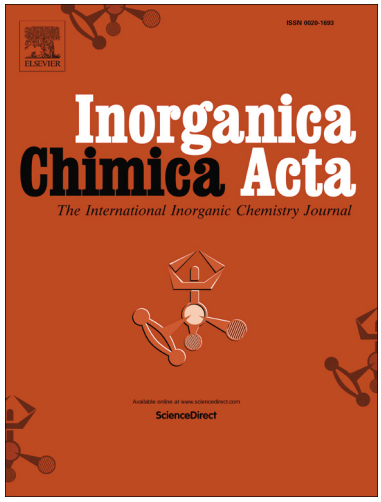


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# A 2D zinc coordination polymer constructed from long and flexible *N*-containing tricarboxylate ligand for encapsulating $Ln^{3+}$ ions and luminescent sensing

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**Abstract**

A new anionic coordination polymer (CP) has been solvothermally prepared with the long and flexible *N*-containing tricarboxylate ligand 5-[(3-(4-carboxyphenyl)-1H-pyrazol-1-yl)methyl]isophthalic acid ($H_3L$) and zinc ions. $\{(Me_2NH_2)[Zn(L)(H_2O)]\cdot DMF\}_n$ (**1**) (DMF = *N*,*N*-dimethylformamide) exhibits a fascinating undulant two dimensional (2D) layered structure and adjacent layers are further linked by π-π interactions to form three dimensional (3D) frameworks with the rhombic channels along the *b* axis, in which the $(Me_2NH_2)^+$ cations are located. **1** emits blue light in solid state and possesses highly stability in different organic solvents. Moreover, it exhibits excellent luminescent sensing properties for $Fe^{3+}$ and $Cr_2O_7^{2-}$ with high sensitivity and selectivity, respectively. The $K_{sv}$ value of $Fe^{3+}$ ion is $2.06 \times 10^4$ $M^{-1}$, while $1.35 \times 10^4$ $M^{-1}$ for $Cr_2O_7^{2-}$ ion. The luminescence quenching can be attributed to resonance energy transfer between **1** and analytes. Furthermore, the lanthanide ions doped materials $Ln^{3+}$@**1** are successfully prepared by cation-exchange, in which $Eu^{3+}$/$Tb^{3+}$ codoped materials show tunable luminescence