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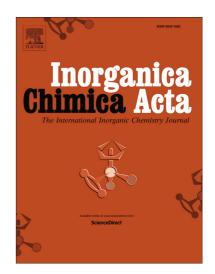
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A 2D zinc coordination polymer constructed from long and flexible N-containing tricarboxylate ligand for encapsulating Ln^{3+} ions and luminescent sensing

Xiuli Guo, Pengcheng Wang, Jianing Xu, Lanlan, Shen, Jing Sun, Yufang Tao,

Xiaodong Chen, Shubo Jing, Li Wang* and Yong Fan*
College of Chemistry, Jilin University, Changchun 130012, Jilin, P. R. China.

e-mail: lwang99@jlu.edu.cn, mrfy@jlu.edu.cn.

Abstract

A new anionic coordination polymer (CP) has been solvothermally prepared with flexible *N*-containing tricarboxylate the long and ligand 5-[(3-(4-carboxyphenyl)-1H-pyrazol-1-yl)methyl]isophthalic acid (H₃L) 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 Fe³⁺ and $\operatorname{Cr}_2\operatorname{O}_7^{2-}$ with high sensitivity and selectivity, respectively. The K_{sv} value of Fe^{3+} ion is $2.06 \times 10^4 \,\mathrm{M}^{-1}$, while $1.35 \times 10^4 \,\mathrm{M}^{-1}$ for $\mathrm{Cr}_2\mathrm{O}_7^{2-}$ ion. The luminescence quenching can be attributed to resonance energy transfer between 1 and analytes. Furthermore, the lanthanide ions doped materials Ln³⁺@1 are successfully prepared by cation-exchange, in which Eu³⁺/Tb³⁺ codoped materials show tunable luminescence

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