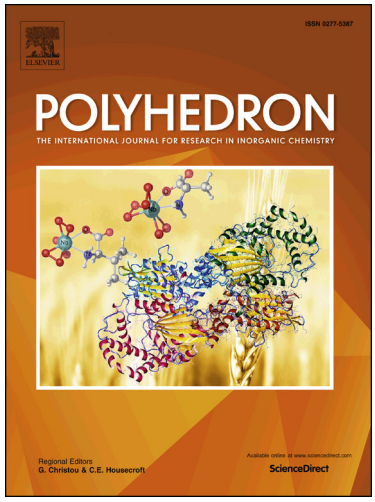

Robust lanthanide metal-organic frameworks with highly sensitive sensing of aniline and slow magnetization relaxation behaviors

Ying Shi, Wen-Min Wang, Gong-Ping Tang, Ya-Xin Zhang, Meng Li, Zhi-Lei Wu

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Robust lanthanide metal-organic frameworks with highly sensitive sensing of aniline and slow magnetization relaxation behaviors

Ying Shi [a], Wen-Min Wang [b,d*], Gong-Ping Tang [c], Ya-Xin Zhang [c*], Meng Li [c], Zhi-Lei Wu [c,d*]

[a] *Department of Biology, Taiyuan Normal University, Jinzhong, 030619, PR China*

[b] *Department of Chemistry, Taiyuan Normal University, Jinzhong, 030619, PR China*

[c] *College of Chemistry and Environmental Science, Hebei University, Baoding, 071002, P. R. China.*

[d] *Key Laboratory of Advanced Energy Materials Chemistry (Ministry of Education), Nankai University, Tianjin 300071, PR China.*

Abstract: Two new three-dimensional lanthanide frameworks $[Ln(BTB)(H_2O)]_n$ (Ln = Eu (**1**) and Dy (**2**)) based on 1,3,5-benzenetribenzoic acid (H_3BTB) were synthesized and characterized. Structural analysis reveals that they were isostructural, in which two lanthanide ions are bridged by four carboxylic groups from different BTB^{3-} in the modes of μ_2-$\eta^1\eta^1$ and μ_2-$\eta^1\eta^2$ to form a binuclear unit. The binuclear units are built into one-dimensional chain via two μ_2-$\eta^1\eta^1$ carboxylic groups, which are further linked by BTB^{3-} to generate three-dimensional frameworks. Compound **1** displays excellent solvent stability. The luminescent investigations suggest that **1** exhibits high sensitive sensing to aniline. Importantly, **1** as a promising luminescent detector for aniline can be recycled at least for four times. Additionally, magnetic studies reveal that **2** displays slow magnetic relaxation behaviors with the energy barrier ($\Delta E/k_B$) of 9.36 K under an external dc field (dc = 2500 Oe).

Keyword: metal-organic frameworks, luminescent, aniline, slow magnetic relaxation

1. Introduction

Lanthanide-based metal-organic frameworks (Ln-MOFs) have attracted intense attention owing to their intriguing structures, as well as the promising

*Corresponding author. E-mail: wangwenmin0506@126.com.
*Corresponding author. E-mail: nancyzhang0823@163.com.
*Corresponding author. E-mail: wuzhilei03@163.com.