

Accepted Manuscript

Ligand field tuning single-molecule magnet behaviors of two dysprosium dinuclear compounds

Yun-Shan Xue, Jin-Cai Bian, Meng-Meng Wu, Pei-Yun Cheng, Wen-Min Wang, Zhi-Lei Wu, Ming Fang

PII: S0277-5387(17)30605-8
DOI: <https://doi.org/10.1016/j.poly.2017.09.028>
Reference: POLY 12838

To appear in: *Polyhedron*

Received Date: 22 June 2017
Revised Date: 14 September 2017
Accepted Date: 17 September 2017

Please cite this article as: Y-S. Xue, J-C. Bian, M-M. Wu, P-Y. Cheng, W-M. Wang, Z-L. Wu, M. Fang, Ligand field tuning single-molecule magnet behaviors of two dysprosium dinuclear compounds, *Polyhedron* (2017), doi: <https://doi.org/10.1016/j.poly.2017.09.028>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Ligand field tuning single-molecule magnet behaviors of two dysprosium dinuclear compounds

Yun-Shan Xue^a, Jin-Cai Bian^b, Meng-Meng Wu^b, Pei-Yun Cheng^b, Wen-Min Wang^{*b}, Zhi-Lei Wu^{*c}, Ming Fang^d

^a *School of Chemistry and Environmental Engineering, Yancheng, Teachers University, Yancheng, 224002, P. R. China.*

^b *Department of Chemistry, Taiyuan Normal University, Jinzhong, 030619, P. R. China.*

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

^d *Department of Chemistry, Hebei Normal University of Science & Technology, Qinhuangdao, 066004, P. R. China.*

Abstract

In this paper, in search of an approach for tuning the single-molecule magnet behaviors in lanthanide polynuclear compounds, two new dinuclear dysprosium compounds based on an 8-hydroxyquinoline Schiff base and two different β -diketonate ligands, $[\text{Dy}_2(\text{hfac})_4\text{L}_2]$ (**1**) and $[\text{Dy}_2(\text{tfac})_4\text{L}_2]$ (**2**) (HL = 2-[[4-iodophenyl]imino]methyl]-8-hydroxyquinoline, hfac = hexafluoroacetylacetonate and tfac = trifluoroacetylacetonate), have been synthesized, structurally and magnetically characterized. The two Dy_2 compounds have very similar structures, however, magnetic studies reveal that **1** and **2** showed different SMM behaviors with energy barriers of 15.70 K for **1** and 6.57 K for **2**. The different SMM behaviors mainly result from the different coordination environments of the central Dy^{III} ions in **1** and **2**.

Keywords: ligand field; dysprosium dinuclear compounds; β -diketonate; structures; single-molecule magnet behaviors

1. Introduction

In recent years, the design and synthesis of single-molecule magnets (SMMs) have attracted significant interest in the field of molecular nanomagnets [1-3]. For such molecules magnetic materials, most of them display in-phase (χ') and out-of-phase (χ'') ac signals and/or magnetic hysteresis-loops below the blocking temperature (T_B) [4].

Download English Version:

<https://daneshyari.com/en/article/7764059>

Download Persian Version:

<https://daneshyari.com/article/7764059>

[Daneshyari.com](https://daneshyari.com)