

# Accepted Manuscript

Research paper

Electron-Donating Effect Dominated 5,6-dimethoxy-2-(2,2,2-trifluoroethyl)-1-indone Dysprosium SMM

Yanping Dong, Weizuo Li, Xiaoyan Zou, Guangfeng Hou, Guangming Li

PII: S0020-1693(17)30511-X  
DOI: <http://dx.doi.org/10.1016/j.ica.2017.06.019>  
Reference: ICA 17667

To appear in: *Inorganica Chimica Acta*

Received Date: 5 April 2017  
Revised Date: 6 June 2017  
Accepted Date: 7 June 2017

Please cite this article as: Y. Dong, W. Li, X. Zou, G. Hou, G. Li, Electron-Donating Effect Dominated 5,6-dimethoxy-2-(2,2,2-trifluoroethyl)-1-indone Dysprosium SMM, *Inorganica Chimica Acta* (2017), doi: <http://dx.doi.org/10.1016/j.ica.2017.06.019>

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.



## Electron-Donating Effect Dominated

## 5,6-dimethoxy-2-(2,2,2-trifluoroethyl)-1-indone Dysprosium SMM

Yanping Dong,<sup>a,b</sup> Weizuo Li,<sup>a</sup> Xiaoyan Zou,<sup>a</sup> Guangfeng Hou,<sup>a</sup> Guangming Li<sup>\*a</sup>

<sup>a</sup>Key Laboratory of Functional Inorganic Material Chemistry (MOE), School of Chemistry and Materials Science, Heilongjiang University, No. 74, Xuefu Road, Nangang District, Harbin, Heilongjiang 150080, P. R. China, E-mail: [gml\\_i\\_2000@163.com](mailto:gml_i_2000@163.com), Fax: (+86)451-86608458; Tel: (+86)451-86608458; <sup>b</sup>Department of Food and Pharmaceutical Engineering, Suihua University, Suihua, Heilongjiang 152061, P. R. China

**Abstract**

A series of three  $\beta$ -diketone mononuclear lanthanide complexes, namely, Dy(5,6-DTFI)<sub>3</sub>(H<sub>2</sub>O)<sub>2</sub>·H<sub>2</sub>O·2CH<sub>2</sub>Cl<sub>2</sub> (**1**), Tb(5,6-DTFI)<sub>3</sub>(H<sub>2</sub>O)<sub>2</sub>·H<sub>2</sub>O·2CH<sub>2</sub>Cl<sub>2</sub> (**2**) and Ho(5,6-DTFI)<sub>3</sub>(H<sub>2</sub>O)<sub>2</sub>·H<sub>2</sub>O·2CH<sub>2</sub>Cl<sub>2</sub> (**3**) (5,6-DTFI = 5,6-dimethoxy-2-(2,2,2-trifluoroethyl)-1-indone) have been isolated by reactions of 5,6-DTFI and LnCl<sub>3</sub>·6H<sub>2</sub>O (Ln = Dy, Tb, Ho). X-ray crystallographic analysis reveals that complexes **1–3** are all eight-coordinated mononuclear structures. Magnetic studies indicate that complex **1** is of single-molecule magnetic behaviors under 0 Oe. Notably, the ligands play essential role on regulating their magnetism. The corresponding structural and magnetic parameters have been discussed in details.

**Keywords:**  $\beta$ -diketone, dysprosium complex, ligand, substituent group

**Introduction**

In the past few decades, scientific interest has evolved towards the development of single-molecule magnets (SMMs) with slow relaxation of magnetization and quantum tunneling of the magnetization characteristics deriving from molecular-based blocking anisotropy.<sup>1</sup> It has been a burgeoning topic of intense interest to chemical, physical, and materials scientists owing to their exotic technological applications in quantum computing, high-density information memory storage, and molecular spintronics.<sup>2</sup> Up to now, many research groups have focused their attention on the synthesis of new types of SMMs.<sup>3</sup> The recent development of lanthanide ions as ideal candidates for the isolation of high barrier SMMs has shifted synthetic efforts, which is due to the considerable intrinsic magnetic anisotropy of the late 4f elements with large spin ground state and high spin-orbit coupling.<sup>4</sup>

Download English Version:

<https://daneshyari.com/en/article/5151529>

Download Persian Version:

<https://daneshyari.com/article/5151529>

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