

Microsymposium

MS18.O01

Organometallic Single-Ion Magnets

B. Wang¹, Z. Wang¹, S. Gao¹

¹*Beijing National Laboratory for Molecular Sciences, State Key Laboratory of Rare Earth Materials Chemistry and Applications, College of Chemistry and Molecular Engineering, Peking University, Beijing 100871, China*

The single-molecule magnets (SMMs) are attracting the increasing interest due to their potential applications in high density information storage, quantum computing, molecular spintronics, and magnetic refrigeration. This field provides scientists a possible access into the crossover of the classical and quantum world, and a wonderful model to study the fascinating magnetic properties between microscopic and macroscopic materials, such as slow magnetization relaxation and quantum tunneling effect. After the milestone discovery of the first single-molecule magnets (SMMs) Mn12ac, many new SMMs were structurally and magnetically characterized. The most studied systems are mainly traditional coordination compounds with polynuclear structures. However, for the difficulties in the control of magnetic anisotropy and exchange coupling interactions of the cluster-type molecules, Mn12ac molecule is still one of the most important SMMs with the high relaxation barrier. From 2011 [1-3], we explored an organometallic sandwich molecule, Cp*ErCOT(Cp* = pentamethylcyclopenta-dienide; COT = cyclooctatetraenide), which behaves as a single-ion magnets, into the field of molecular nanomagnets. It opened a door of SMMs to the chemists in organometallic chemistry. Recently, we found some new sandwich or half-sandwich lanthanide organometallic molecules could also show the slow relaxation of magnetization. We hope these systems can provide new understandings of slow magnetic relaxation and new clues on the design and synthesis of molecular nanomagnets. This work was supported by NSFC, the National Basic Research Program of China.

[1] Shang-Da Jiang, Bing-Wu Wang, Hao-Ling Sun, Zhe-Ming Wang, Song Gao, *J. Am. Chem. Soc.* 2011, 133, 4730, [2] Shang-Da Jiang, Shan-Shan Liu, Li-Nan Zhou, Bing-Wu Wang, Zhe-Ming Wang, Song Gao, *Inorg. Chem.* 2012, 51, 3079, [3] Marie-Emmanuelle Boulon, Giuseppe Cucinotta, Shan-Shan Liu, Shang-Da Jiang, Liviu Ungur, Liviu F. Chibotaru, Song Gao, Roberta Sessoli, *Chem. Eur. J.* 2013, 19, 13726.

Keywords: Organometallic, lanthanide, Single-Ion Magnets