Song GAO

President
Professor of Chemistry
South China University of Technology
Guangzhou 510640, China
E-mail: gaosong@scut.edu.cn; gaosong@pku.edu.cn
http://www.chem.pku.edu.cn/mmm/

Diplomas

1985: B. Sc., Peking University, Beijing, China
1988: M. Sc., Peking University, Beijing, China
1991: Ph.D. Sc., Peking University, Beijing, China

Career summary

1988-1992:	Lecturer, Department of Chemistry, Peking University
1992-1999:	Associate Professor, College of Chemistry, Peking University
1995-1997:	Humboldt Research Fellow, Inst. Inorg. Chem., RWTH Aachen
1998-1999:	Croucher Visiting Professor, the University of Hong Kong
1999-present:	Professor, College of Chemistry, Peking University
2018-present:	Professor, South China University of Technology

Selected publications:

1. Z. Hu, B.-W. Dong, Z. Liu, J.-J. Liu, C. Yu, J. Xiong, D.-E. Shi, Y. Wang, B.-W. Wang, A. Ardavan, Z. Shi*, S.-D. Jiang*, S. Gao*, Endohedral metallofullerene as molecular high spin qubit: diverse Rabi cycles in $Gd_2@C_{79}N$. *Journal of the American Chemical Society*, **2018**, 140, 1123-1130.
2. X.-N. Yao, J.-Z. Du, Y.-Q. Zhang, X.-B. Leng, M.-W. Yang, S.-D. Jiang, Z.-X. Wang, Z.-W. Ouyang, L. Deng*, B.-W. Wang*, S. Gao*, Two-coordinate Co(II) imido complexes as outstanding single-molecule magnets, *Journal of the American Chemical Society*, **2017**, 139, 373-380.
3. Y.-Y. Zhu, C. Cui, Y.-Q. Zhang, J.-H. Jia, X. Guo, C. Gao, K. Qian, S.-D. Jiang, B.-W. Wang*, Z.-M. Wang, S. Gao*, Zero-field slow magnetic relaxation from single Co(II) ion: a transition metal single-molecule magnet with high anisotropy barrier. *Chemical Science*, **2013**, 4, 1802-1806.
4. S.-D. Jiang, B.-W. Wang*, H.-L. Sun, Z.-M. Wang, S. Gao*, An organometallic single-ion magnet. *Journal of the American Chemical Society*, **2011**, 133, 4730-4733.
5. G.-C. Xu, W. Zhang, X.-M. Ma, Y.-H. Chen, L. Zhang, H.-L. Cai, Z.-M. Wang*, R.-G. Xiong*, S. Gao*, Coexistence of magnetic and electric orderings in the metal-formate frameworks of $[NH_4][M(HCOO)_3]$. *Journal of the American Chemical Society*, **2011**, 133, 14948-14951.

Spin Manipulation in Molecules and Solid

Song GAO[a,b*], Bing-Wu WANG[b], and Shang-Da JIANG[b]

[a] School of Chemistry and Chemical Engineering, South China University of Technology, Guangzhou 510640, China. Email：gaosong@scut.edu.cn . [b] Beijing National Laboratory of Molecular Sciences, Beijing Key Laboratory of Magnetoelectric Materials and Devices, College of Chemistry and Molecular Engineering, Peking University, Beijing 100871, China. Email：gaosong@pku.edu.cn

Magnetism originates from the spin of the unpaired electrons and their interaction with the unquenched orbital momenta. Thanks to the development of quantum mechanics, the magnetic properties are deeply understood. It has been a cut-edge research field to manipulate the spin behavior of paramagnetic centers from chemical and physical approaches.

For the chemical methods, I will introduce the molecular design and trial for single-ion magnet, which behaves strong axial magnetic anisotropy. The magnetic anisotropy of metallic ions results from the crystal field interaction. We have designed the crystal field of axial symmetry as well as low-coordinated environment to realize chemical spin manipulation on transition metal and rare earth ions[1-3].

With respect to the physical approaches, I will discuss our recent work on coherent controlling the quantum phase of a cat state based on the pulsed electric field in a rare-earth ion solid. We have precisely determined the Stark effect Hamiltonian parameters and the electric-spin coupling is enhanced to be 1.6 Hz / (T·V·m-1). Combined with microwave, the electric pulses can be used to realize quantum Zeno effect and Deutsche-Josza algorithm[4].

References

[1] Y.-S. Meng, S.-D. Jiang, B.-W. Wang, S. Gao, *Acc. Chem. Res.* **2016**, *49*, 2381.
[2] X.-N.Yao, J.-Z. Du, Y.-Q. Zhang, X.-B. Leng, M.-W. Yan, S.-D. Jiang, Z.-X. Wang, Z.-W. Ouyang, L. Deng, B.-W. Wang, S. Gao, *J. Am. Chem. Soc.* **2017**, *139*, 373.
[3] Y.-S. Meng, L. Xu, J. Xiong, Q. Yuan, T. Liu, B.-W. Wang, S. Gao, *Angew. Chem. In. Ed.* **2018**, *57*, 4673.
[4] Z. Liu, Y.-H. Fang, S.-X. Qin, Z.-M. Wang, S.-D. Jiang, S. Gao, **2019** , *arXiv*:1908.09274.

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