Revealing Intrinsic Quantum Properties of Molecular Nanomagnets

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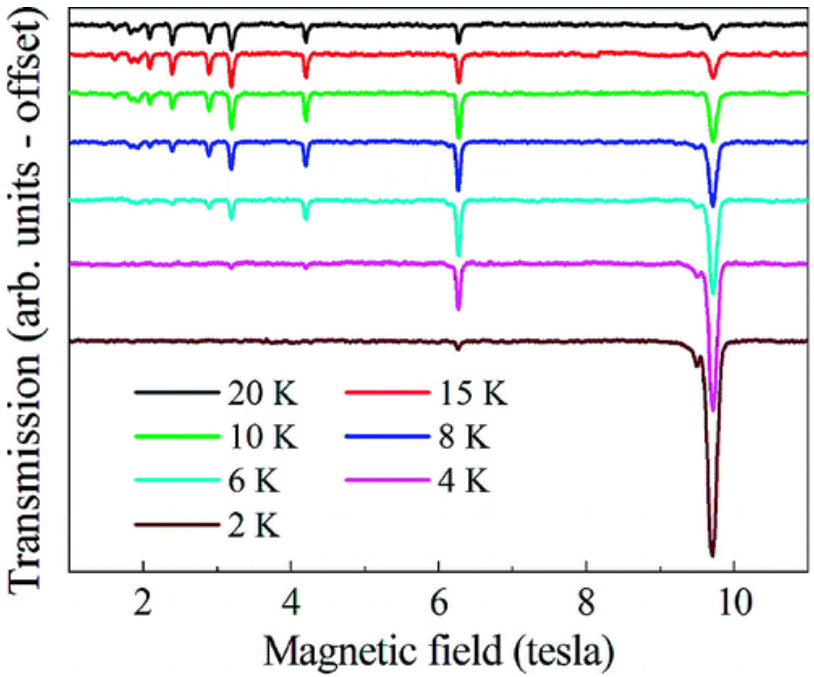

High-field EPR measurements for one of the ferromagnetic $S = 6$ Mn_3 complexes. The sharpness of the features in the data are unprecedented for high-spin MNMs.

The quantum properties of molecular nanomagnets (MNMs) can be controlled by molecular composition and configuration. Molecular and crystallographic symmetries play a crucial role, enforcing selection rules in spectroscopic studies. However, until now,[1] no clear-cut demonstration of such selection rules has been reported. High-field EPR and magnetic hysteresis measurements of a new family of Mn_3 MNMs exhibit extremely sharp resonances.[1,2] Importantly, these measurements display clear-cut evidence for quantum mechanical selection rules. These are the first MNMs to show such behavior, demonstrating that intrinsic symmetry effects do indeed emerge when one can prepare clean enough samples with simple topologies.

[1]Henderson *et al*., Phys. Rev. Lett. **109**, 017202 (2009)
[2]Feng *et al*., Inorg. Chem. (Forum) **48**, 3480 (2009).