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【625】 Single-Molecule Magnetism and Room Temperature Ferromagnetic Crystals of $\text{Tb}_3\text{N@C}_{80}$

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$\text{Tb}_3\text{N@C}_{80}$ is promising for investigating the magnetism of compressed lanthanides. The ligand field of the N^{3-} anion in C_{80} causes the anisotropic alignment of the magnetic moments of the Tb^{3+} , resulting in a frustrated magnetic ground state. A Hamiltonian allowing for tunneling of the Tb^{3+} magnetic moments better explains the paramagnetic behavior of $\text{Tb}_3\text{N@C}_{80}$, especially in the sub-Kelvin regime. Remarkably, in cubic microcrystals we observed room temperature ferromagnetism, which is surprising since the dipolar interaction between molecules implies no magnetic order above 3K. We applied mass spectrometry, energy dispersive x-ray spectroscopy, and inductively coupled plasma spectroscopy to ferromagnetic and paramagnetic samples to find differences in chemical composition.

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