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Quantum Molecular Spintronics Based on Single-Molecule Magnets: Single-Molecule Memory, MOF-Spintronics, Photo-Switching SMM, and Metallic Conducting SMMs

Spintronics is a key technology in the 21st century. In our study, we use Single-Molecule Magnets (SMMs) to overcome “Moore`s Limitation”. We have succeeded to write and read the spin orientations on TbPc₂ by Spin-Polarized STM. For the quantum computer, we have observed the spin Qubits and coherence at room temperature in MOF-Porphyrin V(IV) complexes (3D) due to the rigid lattice of MOF. The photo-switching between SMM and classical magnet has been realized by UV and Vis irradiation, reversibly. Finally, we have synthesized the metallic conducting SMMs with Negative Magnetoresistance.

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