Development of Tunnel Junction Micro-SQUID Magnetometer for Investigation of Single-Molecule Magnets

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We have developed tunnel junction micro-SQUID magnetometer for the precise investigation of single-molecule magnets (SMMs). The magnetometer can be operated in magnetic field up to 1.3 T. The Joule heat associated with the measurement is extremely small (less than 2 fW). This value is 10^7 times smaller than the conventional micro-SQUIDs with Dayem bridge Josephson junction. [1] By using the tunnel junction micro-SQUID magnetometer, the quantum tunneling of magnetization of Fe_8 SMM was reproduced as the stepwise magnetization curve.

[1]W. Wernsdorfer, Adv. Chem. Phys. **118**, 99 (2001).