Ultrahigh Magnetoresistance at Room Temperature in Molecular Wires

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Abstract:

Systems featuring large magnetoresistance (MR) at room temperature and in small magnetic fields are attractive owing to their potential for applications in magnetic field sensing and data storage. Usually, the magnetic properties of materials are exploited to achieve large MR effects. Here, we report on an exceptionally large (>2000%), room-temperature, small-field (a few millitesla) MR effect in one-dimensional, nonmagnetic systems formed by molecular wires embedded in a zeolite host crystal. This ultrahigh MR effect is ascribed to spin blockade in one-dimensional electron transport. Its generic nature offers very good perspectives to exploit the effect in a wide range of low-dimensional systems.

References: