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Extremely weak length-dependent spin transport along alkane chain in Fe₃O₄/monolayer molecules nanoparticles DI WU, SHEN WANG, FENJUAN YUE, AN HU, YOUWEI DU, Nanjing University — Spin transport along alkane chain is investigated using self-assembled monolayers (SAMs) saturated molecules on magnetic nanoparticles. Transmission electron microscopy shows the interparticle distance is about the length of the molecules. Temperature dependent resistivity exhibits variable range hopping behavior, which is attributed to the hopping in the nanoparticle. The resistivity exponentially increases with increasing the molecular length, indicating tunneling is dominant conduction mechanism in the saturated molecules. However, the magnetoresistance is almost constant even though resistivity changes two orders of magnitude at room temperature with varying the molecular length. At low temperature the magnetoresistance gradually increases due to the increase of the surface spin polarization of the nanoparticles.

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