Thermopower Measurements of Highly Conducting Single-Molecule Devices

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We compare the conductance and thermopower for two families of molecules: pi-conjugated polyphenyls, which have a high conductance and thermopower, and sigma-bonded alkyl systems, where we observe a significant thermopower despite the low conductance. For these measurements, we use the most probable thermopower to determine a power factor, $GS^2$, for each molecular junction studied. Our results show that the molecular thermopower increases systematically and non-linearly with molecular length and also that the power factor is exceptionally large for the case of the biphenyl. [1] Z. L. Cheng, R. Skouta, H. Vazquez et al., Nat. Nano. 6, 353 (2011). [2] W. Chen, J. R. Widawsky, H. Vázquez et al., J. Am. Chem. Soc. 133, 17160 (2011).

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