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Inelastic effects on the transport properties of alkanethiols YU-CHANG CHEN, University of California, San Diego, MICHAEL ZWOLAK, California Institute of Technology, MASSIMILIANO DI VENTRA, University of California, San Diego — We discuss inelastic scattering effects in alkanethiols of different lengths sandwiched between metal electrodes. In particular, we examine local heating and the inelastic contribution to the current. We observe that the intensities of certain peaks in the inelastic scattering profile alternate depending on odd and even number of alkyl carbons. The cause of the odd-even effect is the alternating strength of the coupling between electrons and the longitudinal component of CH3-group motion. We also find that in the absence of heat dissipation into the bulk electrodes the local temperature of alkanethiols is relatively insensitive to the length of the wires. This is due to the fact that the rates of heating and cooling processes scale similarly with length. On the other hand, when considering heat dissipation into the bulk electrodes, the local temperature of alkanethiols decreases as their length increases.

Yu-Chang Chen
University of California, San Diego

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