

Abstract Submitted  
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**Vibrational heating in molecular junctions** DANIEL WARD, DAVID CORLEY, JAMES TOUR, DOUGLAS NATELSON, Rice University — Energy injection, distribution and dissipation are of great importance in understanding molecular electronics. One method of characterizing the distribution of energy in a system is to measure the effective temperature. Using surface-enhanced Raman spectroscopy (SERS) of molecular nanojunctions, we measure the effective vibrational temperatures of a molecular nanojunction as a function of bias. We observe significant mode-specific vibrational pumping by both optical excitation and DC current, with effective temperature changes exceeding several hundred Kelvin. These measurements provide direct information about heat generation and dissipation in molecular-scale junctions and allow direct comparisons with theories of nanoscale heating.

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