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**Quantum-state-resolved probing of molecular inner-sphere reorganization using a single-molecule transistor** NATHALIE DE LEON, WEN-JIE LIANG, QIAN GU, HONGKUN PARK, Harvard University — The coupling of electron transport through a single molecule to various degrees of freedom, such as spin, charge, and vibrations, can be probed using a single molecule transistor. The addition or subtraction of electrons usually accompanies a change in molecular geometry, a phenomenon known as inner-sphere reorganization. We have studied the effects of inner-sphere reorganization on electron transport using two complexes, ferrocene and  $\text{Fe}(\text{bpy})_3^{n+}$  ( $n = 1, 2, 3$ ), as model systems. The reported energies of vibrational excitations in  $\text{Fe}(\text{bpy})_3^{n+}$  are in agreement with existing IR and Raman spectroscopic data.

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