

Abstract Submitted
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Probing Intermolecular Coupled Vibrations by STM Inelastic Electron Tunneling Spectroscopy. ZHUMIN HAN, GREGORY CZAP, CHEN XU, CHI-LUN CHIANG, DINGWANG YUAN, RUQIAN WU, WILSON HO, University of California, Irvine — Intermolecular interactions can induce energy shifts and coupling of molecular vibrations. However, the detection of intermolecular coupled vibrations has not been reported at the single molecule level. Here we show the detection and identification of an intermolecular coupled vibration between two molecules, one on the substrate and the other one on the tip within the gap of a sub-Kelvin scanning tunneling microscope, by inelastic electron tunneling spectroscopy (IETS) and density functional calculations. Furthermore, the anisotropy of the molecular adsorption potential on the substrate is revealed by imaging the IETS intensity of the coupled vibration.

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