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Vibronically Mediated Conductance Gated by Charging of a Single Impurity Complex

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The electronic properties of single C_{60} molecules, C_{60} monolayer, and alkali doped C_{60} adsorbed on Al_2O_3 grown on NiAl(110) have been studied by STM spectroscopy and microscopy. Due to the unique double barrier tunneling junction (DBTJ) configuration, consisting of the vacuum and oxide barriers, interesting phenomena such as vibronic progressions, bipolar transport, and conductance gated by single impurity charging were observed. These results provide valuable information on the electron-phonon interaction, molecular conductance, and the role of impurities in nanoscale electron transport.