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Gold point-contact measurements of molecular junctions LATHA VENKATARAMAN, JENNIFER KLARE, IRIS TAM, COLIN NUCKOLLS, MARK HYBERTSEN, MICHAEL STEIGERWALD, Columbia University — The conductance of molecular junctions, formed by breaking gold point-contacts dressed with various thiol-functionalized organic molecules, is measured at 293 K and at 30 K. In the presence of molecules, individual conductance traces measured as a function of increasing gold electrode displacement show clear steps below the quantum conductance steps of the gold contact. These steps are distributed over a wide range of molecule-dependent conductance values. Histograms constructed from all conductance traces therefore do not show clear peaks either at room and low temperatures. Filtering of the data sets by an objective automated procedure does only marginally improve the visibility of such features. We conclude that the geometrical junction to junction variations dominate the conductance measurements.

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