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Electrical conductance adsorption isotherms of rare gases on individual single-wall carbon nanotubes[1] OSCAR VILCHES, HAO-CHUN LEE, BORIS DZYUBENKO, DAVID COBDEN, University of Washington — Simultaneous resonance frequency and electrical conductance isotherm measurements of inert gases adsorbed on the surface of a single suspended single-wall carbon nanotube have been performed to understand the relationship between the results of the two methods. The resonance frequency measurements determine the ratio between adsorbed mass and the mass of the nanotube. The conductance also varies with the amount of mass adsorbed, but its relationship with the adsorbed mass varies between different nanotubes. The conductance change is particularly dramatic in two cases: when transitions occur between two phases of different density, for example at the liquid-vapor transition of two-dimensional (2d) Ar in the 50 K range; and when Coulomb blockade oscillations are clearly visible, in particular for 2d ^{4}He gas adsorption in the 5 to 10 K range. Current work on the connection between conductance and frequency isotherms with various gases will be presented.

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