Wetting Transitions of Simple Fluids on Alkali Metal Surfaces

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Recent experiments confirm theoretical prediction of Cole and others that due to the exceptionally weak substrate attraction, simple fluids such as helium-4 and hydrogen does not wet certain alkali metal surfaces. As temperature is increased towards the wetting temperature, Tw, a thick film is adsorbed on the surface. For T > Tw, a prewetting or thin film/thick film transition is found. For Ne on Cs, the weakest adsorption system, measured in terms of the ratio of the substrate-adsorbate to adsorbate-adsorbate attraction, no adsorption of neon is found on Cesium even when the temperature is raised to the critical temperature of neon. Instead, the quartz microbalance data suggest the presence of a vapor film adjacent to the cesium surface when the sample cell is filled with liquid neon.