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Effect of surface morphology on adsorption-induced bending of microcantilevers RAMYA DESIKAN, Physics Dept., IDA LEE, ECE Dept., THOMAS THUNDAT, Physics Dept. Univ. of Tennessee — Microcantilevers undergo bending due to molecular adsorption when adsorption is confined to a single surface. The origin of the adsorption-induced force is assumed to be surface stress variation due to molecular adsorption. Single crystal silicon cantilevers were etched for a series of different time periods using two different types of Potassium Hydroxide solutions in order to obtain a rough and a smooth finish on the cantilever surface. Cantilevers that approximately had the same resonance frequency in the rough and smooth etched categories were chosen for comparison in the experiment. Liquid phase adsorption of 1-Do-decan-thiol on the cantilevers having a thin gold receptor was investigated with optical beam deflection method. The surface roughness of the cantilevers was quantified using atomic force microscopy imaging of the cantilever. Our results indicate that an increase in surface area does not increase the bending of a microcantilever, a smoother surface provides a better platform for the formation of a Self Assembled Monolayer. The un-etched cantilevers were used as the control and had the least deflection.

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