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Interpretation of Surface Dynamics and Bond Strengths of Polystyrene Microspheres on a Quartz Crystal Microbalance by Analysis of Decoupling Curves[1] IYAM LYNCH, JACQUELINE KRIM, North Carolina State University — In this study we have analyzed the behavior of 5μm diameter polystyrene spheres deposited from aqueous solution on the electrode of a quartz crystal microbalance (QCM). By varying the driving voltage of the QCM, the samples exhibit a frequency response with respect to the crystal amplitude ("decoupling curve"). Decoupling curves provide information about the friction, via changes in the coupling between the spheres and the QCM surface as the oscillation amplitude is swept forward and backward. Qualitative information in regards to the change in coupling and surface dynamics can be backed out using known QCM frequency response models.[2,3] Optical observations show that the particle motion is dependent on the oscillation direction and surface topology of the QCM. Optically observed sliding motion as well as preliminary data on detection of microsphere transfer from adjacent QCMs will also be reported on.

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