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Study of Adsorption Isotherms Using Micromachined Quartz Crystal Gravimetric Sensors[1] JAY MATHEWS, Colorado State University, ABHIJAT GOYAL, SRINIVAS TADIGADAPA, Pennsylvania State University — Using microfabrication techniques, it is possible to realize gravimetric sensor platforms which can resolve mass down to a few femtograms and are robust enough to operate even in aqueous ambient. In this study, an ultra-sensitive quartz crystal microbalance (QCM) was used to study the self-assembly of thiol-based alkyl molecules on the gold electrode of the QCM and subsequent specific adsorption of protein molecules on top of the grown Self Assembled Monolayers (SAMs). Specifically, isotherms for formation of monolayers of 1-hexadecanethiol were generated, as well as adsorption isotherms for proteins such as human serum albumin (HSA) on the grown monolayers. Such fundamental studies using gravimetric sensor platforms with unprecedented sensitivity are expected to result in better understanding of the biological processes in the human body, better control over the self-assembly process, and possibly in realizing a System on a Chip (SOC) entirely through the self-assembly process.

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