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Grafted Peptides for the Control of Interfacial Properties[1]
WILLIAM DUCKER, Virginia Tech, WADE MOSSE, SALLY GRAS, University of Melbourne — Peptide or protein polymers that are used to control interfacial properties are usually prepared by solid-state synthesis and then adsorbed to an interface. Such a method results in a low yield and places restrictions on polymer structure, because the peptide must be designed to adsorb, as well as to provide the interfacial control. The method of grafting peptides from surfaces is an alternate method that is potentially very useful because the peptide is covalently linked, and the sequence limitations related to adsorption are removed. To demonstrate this technique, we have used solid-phase peptide synthesis to graft a 15-residue peptide, EKEKEKEKEKEKEGG, containing a zwitterionic sequence of alternating lysine and glutamic acid residues from the surface of an aminosilanized silicon wafer by placing the silicon wafer within a commercial microwave peptide synthesizer. We confirmed the presence of this peptide layer on the surface by X-ray photoelectron spectroscopy (XPS) and ellipsometry. Atomic force microscopy (AFM) was then used to study the forces between the peptide-modified surface and a borosilicate glass sphere as a function of solution pH. We will also discuss the use of grafted peptides to control the stability of colloidal suspensions.

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