The Department of Chemistry and Biochemistry

Seminar Series

Presents a Seminar Titled:

"Surface Chemical Gradients by Controlled Rate Infusion"

Presented By

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Gradient materials are designed to incorporate a surface that exhibits continuous, gradually changing chemical (i.e., polarity) or physical (i.e., porosity) properties along one, two or even three dimensions. They have found diverse applications in the rapid screening of new catalyst and sensor materials, and have been used to regulate the adhesion of cells and their release, to direct the growth of axons, to control the motions of macromolecules, vesicles, nanoparticles, and cells, to effect difficult chemical separations, and even to drive the transport of liquids. In recent work, we demonstrated that sol-gel chemistry combined controlled rate infusion could be used to obtain organosilane based chemical gradients. In this method, an organoalkoxysilane solution is slowly infused into a container with a substrate mounted vertically so that time-based exposure along the substrate forms a gradient in chemical functionality. The most important attribute of this method is that the local steepness of the gradient can be systematically controlled by simply changing the rate of infusion. In this seminar, I will discuss the fabrication of surface chemical gradients incorporating amine functionalities as well as multi-component gradients from aminoalkoxysilanes and phenyltrimethoxysilane and their characterization using x-ray photoelectron spectroscopy (XPS) and colorimetric methods. Application of these materials as stationary phases for thin-layer liquid chromatography will also be described.

Thursday, September 12, 2013 at 12:20 p.m. in BAL 1012