

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Interactions between Counterions and Brushes of ssDNA** D. Y. PETROVYKH, University of Maryland, College Park, MD and Naval Research Laboratory, Washington, DC, A. OPDAHL, University of Wisconsin, La Crosse, WI, XIAOSONG LIU, F. J. HIMPSEL, University of Wisconsin, Madison, WI, L. J. WHITMAN, Naval Research Laboratory, Washington, DC — We investigate interactions between counterions and brushes of single-stranded DNA (ssDNA) using x-ray photoelectron (XPS) and near-edge x-ray absorption fine structure (NEXAFS) spectroscopies. Monolayers of thiol-modified thymine homo-oligonucleotides on gold are convenient model systems because for these ssDNA films the interpretation of the spectroscopic data is simplified and therefore quantitative analysis of the surface density, conformation, and composition is possible. A series of experiments was designed to quantify residual counterions retained in ssDNA brushes after common rinsing procedures. We find that while the residual amount of divalent Ca cations is essentially unaffected by rinsing, the monovalent K cations can be effectively removed by a rinse under flowing deionized water. Our results demonstrate that ex situ surface spectroscopies can be effectively used to systematically investigate interactions between ssDNA and counterions.

Dmitri Petrovykh  
University of Maryland, College Park, MD and  
Naval Research Laboratory, Washington, DC

Date submitted: 02 Dec 2006

Electronic form version 1.4