

Abstract Submitted  
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**Molecular motion in alkylsilane self-assembled monolayers**<sup>1</sup> DER-  
RICK STEVENS, North Carolina State University (NCSU), MARY SCOTT,  
LAURA GUY, JASON BOCHINSKI, LAURA CLARKE, NCSU — We have inves-  
tigated intra-molecular rotation within polar-substituted alkylsilane self-assembled  
monolayers (SAMs) on fused silica, utilizing surface-sensitive dielectric spectroscopy.  
Both trichlorosilanes (which allow crosslinking within the SAM) and monochlorosi-  
lanes (attached only to the surface) are utilized to grow monolayer and submonolayer  
films. Dielectric loss spectra as a function of temperature have been obtained for  
SAMs with varying carbon chain length, surface coverage, and alkyl terminal group.  
As shown by ellipsometry, contact angle measurements, and AFM, monochlorosi-  
lanes form a more disordered monolayer than trichlorosilanes. This more disordered  
film may result in additional degrees of freedom within the monolayer, or in the  
language of phase transitions, a rotator phase. Issues such as uncontrolled vertical  
polymerization and film growth by island formation and their effect on rotational  
dynamics will be discussed.

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