

Abstract Submitted
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Molecular motion in alkylsilane self-assembled monolayers¹ DER-
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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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