Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

SFG and SPR Study of Sodium Dodecyl Sulfate Film Assembly on Positively Charged Surfaces[1] SANGHUN SONG, TOBIAS WEIDNER, NESAC/BIO, Univ. of Washington, MATTHEW WAGNER, The Procter and Gamble Company, DAVID CASTNER, NESAC/BIO, Univ. of Washington, NESAC/BIO TEAM, PROCTER AND GAMBLE COLLABORATION — This study uses sum frequency generation (SFG) vibrational spectroscopy and surface plasmon resonance (SPR) sensing to investigate the structure of sodium dodecyl sulfate (SDS) films formed on positively charged and hydrophilic surfaces. The SPR signals show a good surface coverage suggesting that full monolayer coverage is reached at 1 mM. SFG spectra of SDS adsorbed exhibits well resolved CH_3 peaks and OH peaks. At both 0.2 mM and 1 mM SDS concentration the intensity of both the CH_3 and OH peaks decreased close to background levels. We found that the loss of SFG signal at 0.2 mM occurs at this concentration independent of surface charge density. It is more likely that the loss of signal is related to structural inhomogeneity induced by a striped phase - stand-up phase transition. This is supported by a distinct change of the relative SFG phase between CH_3/OH near 0.2 mM. The second intensity minimum might be related to charge compensation effects. We observed a substrate dependence for the high concentration transition. We also observed distinct SFG signal phase changes for water molecules associated with SDS layers at different SDS solution concentrations indicating that the orientation of bound water changed with SDS surface structure.

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Date submitted: 10 Nov 2011 Electronic form version 1.4