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Investigation of Surface Mounted Molecular Rotors Through Optical Second Harmonic Generation JAMES D. WALKER, CHARLES T. ROGERS, Dept. of Physics, Univ. of Colorado, Boulder, CO 80309, GREGG S. KOTTAS, JOSEF MICHL, Dept. of Chemistry, Univ. of Colorado, Boulder, CO 80309 — Exploiting the lack of inversion symmetry near a surface, optical surface second harmonic generation (SHG) can be a powerful tool for probing molecular monolayers (or multilayers) adhered to such a surface. In particular, spectroscopy by resonant SHG (Ti:Sapph laser pulses plus Optical Parametric Oscillators and frequency doubling) can provide insight into the orientation of the different sections of the molecular rotor (rotator and axle). The molecular population's orientation can then be studied in the presence of externally applied electric fields, given that the rotator has an intrinsic electric dipole moment, as well in variable temperature UHV environments (down to approx. 30 Kelvin). Concentrating on an anthracene based rotor molecule, synthesized in-house and utilizing silane attachment chemistry on fused silica substrates, we will describe progress made in probing the population's orientation through SHG as well as sample preparation and characterization (linear UV-VIS spectroscopy, FTIR, and XPS).

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