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Geometric and Electronic Structure of Dodecanethiol SAMs Grown on Au, Ag, Cu, and Pt Crystals CARL VENTRICE, HEIKE GEISLER, Texas State Univ., JAMES BURST, SHAWN HUSTON, TIM SWEENEY, DANIEL BORST, Univ. of New Orleans — The geometric and electronic structure of dodecanethiol ($C_{12}H_{25}SH$) SAMs on Au(111), Ag(111), Cu(111), and Pt(111) substrates has been studied using low energy electron diffraction and angle-resolved ultra-violet photoelectron spectroscopy. The SAMs were grown both in solution and by vapor deposition in UHV. The electronic structure of the fully saturated SAM is similar on all of these substrates, with peaks observed at binding energies of 6.5, 10, 14, and 20 eV. The geometric structure of the molecular films at intermediate coverages is different for each substrate. Growth on Au proceeds through a well-ordered lying-down phase followed by a disordered phase and a well-ordered $\sqrt{3}$ standing-up phase at saturation. Initial growth on Pt(111) shows first a p(2x2) symmetry followed by a $\sqrt{3}$ symmetry, which indicates that there is dissociative adsorption on Pt. This is followed by a disordered phase at saturation. Films on Ag and Cu show a great deal of disorder at all stages of growth.

Carl Ventrice
Texas State Univ.

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