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Achieving Flat Gold Surfaces for the Organization of Organic Molecules JACOB MARTIN, DR. JESSICA BICKEL, Cleveland State University — Organic electronics are interesting but suffer in competition with inorganics due to their lower conductivity. Crystallizing organic semiconductors can increase their conductivities. Organic molecules can by crystallized via self-assembly driven by the topography and chemistry of an atomic surface reconstruction. This work examines the Au(111) surface, which has a herringbone reconstruction. The first step to using such a surface for self-assembly is developing a method to create atomically smooth Au(111) surfaces. One method to smoothen surfaces is annealing, which allows the atoms to rearrange into a lower energy state. In this work, a propane torch is used to anneal the sample at 710±10C for two minutes, and then three minutes at 410±10C. This yields larger and flatter terraces compared to the unannealed material. The unannealed gold had mounds with no flat areas and a max depth of 7.6 nm. The annealed Au(111) had flat terraces, 13-30 nm in size, with step heights in the order of .235 nm, which matches the interplanar spacing for Au(111). In the future we will optimize this process to achieve large terraces by adjusting the temperatures and times used.

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