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Oxygen-induced nanoscale pyramidal faceting of Rh(210) surface GOVIND ., W. CHEN, H. WANG, THEODORE E. MADEY, Department of Physics & Astronomy, Rutgers University, Piscataway, NJ 08854, USA — The adsorption of oxygen and nanometer-scale faceting induced by oxygen have been studied on atomically-rough fcc Rh(210) using LEED and AES. The Rh(210) surface remains planar at room temperature after being exposed to oxygen. Upon annealing at temperatures above 600K, Rh(210) covered by ∼1ML of oxygen undergoes reconstruction to form 3-sided nanoscale pyramids characterized by two {731} facets and a (2x1)-reconstructed (110) facet. The surface remains faceted for T up to 850K. Oxygen can be completely removed from the faceted surface via CO oxidation at 400K or reaction with H_2 at room temperature, while preserving the faceted structure. The clean faceted surface remains stable below 600K and irreversibly relaxes to the planar surface at higher temperatures. The clean faceted Rh(210) surface is a potential substrate to study surface reactions whose rates are sensitive to atomic structure and/or nanoscale (facet) size. The results are compared with measurements of oxygen-induced faceting of Ir(210). Work supported by DOE, Office of basic Energy Science

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