

o.m8.p13 Adsorption of oxygen on copper films on a Pt(111) surface: structure and composition. J.S. Tsay, T. Mangen, R.-J. Linden and K. Wandelt. *Institut für Physikalische und Theoretische Chemie der Universität Bonn, Wegelerstraße 12, D-53115 Bonn, Germany.*
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The structure and composition of oxygen exposed Cu films on Pt(111) have been studied by low-energy electron diffraction (LEED), Auger electron spectroscopy (AES), and ultraviolet photoelectron spectroscopy (UPS). From the LEED observations it is concluded that the copper growth is epitaxial and rotationally commensurate to the Pt(111) substrate for copper coverages larger than 1.2 ML. After exposing the 1.2 ML Cu/Pt(111) system to 12 L O₂ at 320 K, no new feature was observed in the LEED patterns. After subsequent annealing the system at temperatures between 600 and 700 K, a 2x2 structure of a copper oxide was observed. From the AES and UPS measurements, co-existence of a copper oxide and a Cu-Pt alloy were observed. At higher temperatures, most of the copper adatoms diffuse into the Pt(111) substrate to form an alloy while the oxygen desorbs. For oxygen adsorption on copper films, the concentration of adsorbed oxygen in an oxygen-saturated copper film is higher for a not completed copper layer because of more edge sites at the copper islands and larger Cu-Cu distances due to pseudomorphic growth. A high adsorption rate was observed at the beginning caused by the bond of oxygen onto the film. From sputter profiling measurements of three differently prepared O/Cu/Pt(111) films one can see that the oxygen distribution is not the same and in neither case homogeneous. For a film prepared by alternate steps of copper deposition and oxygen adsorption, the amount of oxygen at both interfaces film/vacuum and film/Pt is higher than within the film.