

Tungsten oxide thin films were prepared by vacuum evaporation on surfaces of Pd(111), Cu(111), Cu(110) and Cu(100) single crystals and studied by RHEED, XPS and AFM methods. The tungsten oxide deposition was done at temperatures from 300 °C to 400 °C in UHV or in oxygen atmosphere. The best deposition conditions – substrate temperature of 400 °C and oxygen atmosphere – were found resulting in growth of epitaxial and only partially reduced thin films. Thin films grown on the Pd(111) and Cu(111) surfaces consisted of two phases: a nearly atomically flat phase with (100) epitaxial plane and a phase formed by three dimensional particles with (111) epitaxial plane. Thin film deposited on Cu(100) also consisted of two phases: a flat film with (100) epitaxial plane and self-organised 1D structures parallel to Cu[010] and Cu[001] directions. Thin film prepared on the Cu(110) surface contained solely 1D structures parallel to Cu[1-10] surface direction. Capability of the partially reduced thin films for oxidation was studied. We applied oxidation using RF oxygen plasma, O₂ exposure at elevated temperature and exposure to atmosphere. Thermal stability of the WO₃/Cu(110) system was also investigated by heating up to 620 °C.