

Abstract Submitted
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Transpassive Dissolution of Copper and Rapid Formation of Brilliant Colored Copper Oxide Films NARJES FREDJ, T. DAVID BURLEIGH, Materials and Metallurgical Engineering Department, NEW MEXICO TECH TEAM — This investigation describes an electrochemical technique for growing adhesive copper oxide films on copper with attractive colors ranging from gold-brown to pearl with intermediate colors from red violet to gold green. The technique consists of anodically dissolving copper at transpassive potentials in hot sodium hydroxide, and then depositing brilliant color films of Cu_2O onto the surface of copper after the anodic potential has been turned off. The color of the copper oxide film depends on the temperature, the anodic potential, the time t_1 of polarization, and the time t_2 , which is the time of immersion after potential has been turned off. The brilliant colored films were characterized using glancing angle x-ray diffraction, and the film was found to be primarily Cu_2O . Cyclic voltammetry, chronopotentiometry, scanning electron microscopy, and x-ray photoelectron spectroscopy were also used to characterize these films.

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