Abstract Submitted
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Fabrication of Metallic Nanoporous Films by Selective Chemical Etching[1] SHILPA CHAVA, WEI JIANG YEH, University of Idaho — The objective of this study is to synthesize and characterize different nanoporous structures by chemical etching. The experiments were conducted on three different materials: We treated 6 carat white gold (Au/Ag alloy, 1:3 ratio by weight) with 70% HNO_3 to grow Au nanoporous, the 50/50 solder wire (Pb/Sn alloy) with 93% H_2SO_4 to create Pb porous and Imitation Italian gold leaf (Cu/Zn alloy, 82/18 by wt. %) with NaOH solution (5 gm NaOH per 100 ml distilled H_2O) for Cu porous. The free-standing porous films have been analyzed by scanning electron microscopy (SEM), energy dispersive x-ray spectroscopy (EDX), high quality x-ray mapping (XRM). We observed the composition of the porous materials at every stage of chemical dealloying and conducted tests with different process parameters to optimize the size of self-ordered porous structures. Our experiments resulted in sponge like Au nanoporous of 10-200 nm, Pb pores of 10-300 nm and Cu pores of 10-150 nm. The results showed a technically improved fabrication of different nanoporous materials with high surface area and well defined pore morphology.

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