

Abstract Submitted  
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**Microstructures of Bi-alloy Metal Films by Dealloying**<sup>1</sup> W.J. YEH, SHILPA CHAVA, JULIA TILLES, University of Idaho — The objective of this study is to synthesize and characterize different microstructures that are fabricated by dealloying from bi-alloys. With selected chemical etching one element with high etching rate is dissolved and the remaining component may form porous structures. This process is also called as dealloying. The experiments were conducted on three different materials. 6 carat white gold (Au/Ag alloy, 1:3 ratio by weight) leaves that were purchased commercially were etched with 70% HNO<sub>3</sub> to remove silver. The remaining gold materials congregated to form well connected network structure that was free standing. This Au nanoporous samples had void sizes from a few nanometers to a few hundred nanometers. The second material we studied was the 50/50 solder wire (Pb/Sn alloy). The solder wire was pressed to a thin sheet. The Pb/Sn sheet was etched with 93% H<sub>2</sub>SO<sub>4</sub>. After Sn was dissolved Pb porous structure was formed. In this porous structure, Pb formed crystal-like nanostructures. The third one was Imitation Italian gold leaf (Cu/Zn alloy, 82/18 by wt. %). The leaf was immersed into NaOH solution. By etching out Zn, a free-standing nanoporous Cu film has been formed.

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