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Dealloying Behavior of NiCo and NiCoCu Thin Films¹ BENJAMIN PEECHER, JENNIFER HAMPTON, Hope College — Porous metals and alloys, such as those fabricated via electrochemical dealloying, are of interest for a variety of energy applications. Here, the electrochemical dealloying process was explored for electrodeposited binary NiCo and ternary NiCoCu thin films. For four different metal ratios, films were dealloyed using linear sweep voltammetry to various potentials to gain insight into the evolution of the film over the course of the linear sweep. The structure and composition of each sample were examined before and after linear sweep voltammetry was performed. For NiCo films, dealloying resulted in almost no change in composition but did result in an increased capacitance, indicating the removal of material from the films. Dealloying also resulted in the appearance of large pores on the surface of the high Ni percentage NiCo films, while low Ni percentage NiCo films had little observable change in morphology. For NiCoCu films, Cu was almost completely removed at linear sweep potentials greater than 0.5 V versus Ag/AgCl. The linear sweep removed large Cu-rich dendrites from the films, while also causing increases in measured capacitance.

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