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Characterization of Nickel-Zinc Electrodeposition[1]

KEVIN TKACZ[2], JENNIFER HAMPTON, Hope College — Nanoporous nickel serves as an interesting catalytic material due to its large surface area and therefore high reactivity. The purpose of this project is to develop a method for producing thin films of nanoporous nickel. This is done by the electrodeposition of a nickel-zinc alloy followed by the selective removal of zinc. A series of primarily sulfate baths were used for deposition in an attempt to produce samples ideal for selective removal of zinc. Deposition variables examined include metal concentration in the solution, ratio of metals in solution, deposition potential and solution pH. Depositions were characterized with scanning electron microscopy (SEM) and energy dispersive x-ray spectroscopy (EDS). Linear sweep voltammetry was also used to characterize the dealloying process. It was determined that increasing the nickel concentration in solution also increased the concentration in the deposit. Uniform depositions with low nickel concentration were successfully made although attempts to increase the nickel concentration adversely affected the deposition quality.

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