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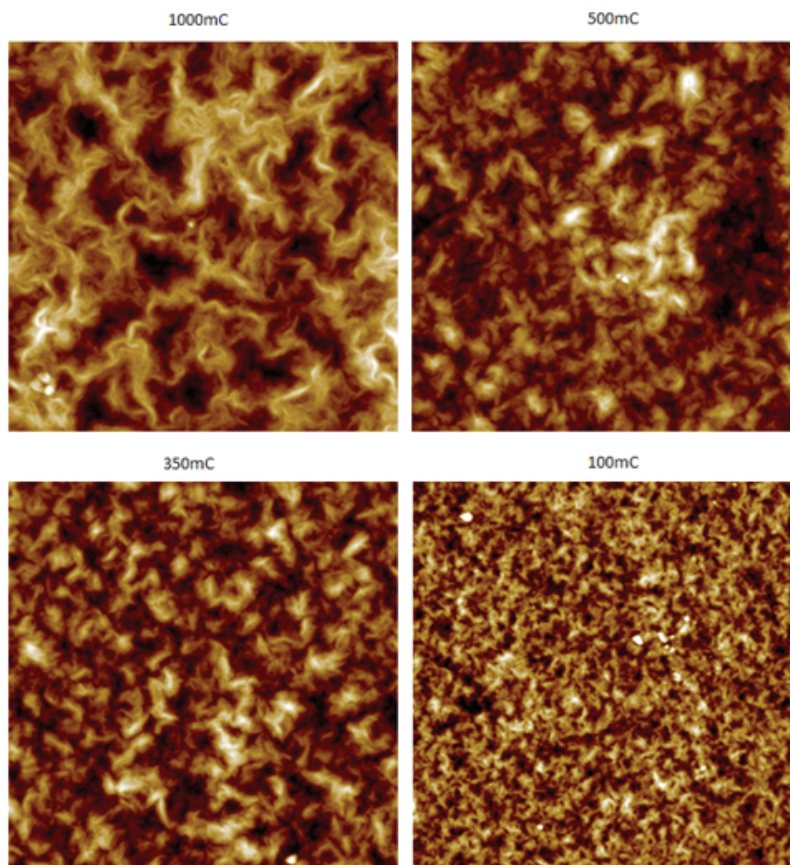
Area and Capacitance Characterization of Nickel, Cobalt, and Nickel-Cobalt Electrodeposited Thin Films

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Many catalysts in energy production, specifically hydrogen and methanol fuel cells, use platinum as an effective catalyst. Platinum used in these fuel cells is uneconomical causing any energy production mechanisms that use platinum to be cost ineffective. There have been many studies with different combinations of platinum with different metals such as nickel, copper, iron, and cobalt to lessen the amount of platinum needed. However, these studies have relied on platinum being in the thin film electrodes. Through the use of electrodeposition, nickel, cobalt, and nickel-cobalt thin films were created with controlled potential electrolysis without the need of platinum. Characterization of these thin film electrodes were done with cyclic voltammetry and atomic force microscopy. With these methods, the electrochemical area, capacitance, and roughness factor of each thin film electrode were able to be determined. Correlation of these data and the significance of these measurements help to determine the effectiveness that these thin film electrodes could have as catalysts or in other energy applications.

Nickel-Cobalt Samples



All images at 10 μ m scan size