



San Fernando Valley Chapter Presents:

CSUN Student Night

Ms. Maya Saad, California State University Northridge

“Polymer Protective Barriers for Improved Implantable Glucose Sensor Life”

There is a lot of promise and demand for the enhancement of glucose sensors given that so many people are affected by diabetes and require continuous monitoring of glucose levels for life supporting reasons. This research project involved testing the impedance of various polymer materials which met the biocompatible, non-biodegradable standards required for the device to function within the human body's aggressive environment. Utilizing Gamry Framework's Electrochemical Impedance Spectroscopy software allowed us to determine the impedance characteristics of selected polymers. This selection included 5% and 10% concentration of Poly (2-hydroxyethyl methacrylate), 6% concentration Polyurethane, Polystyrene Sulfuric Acid and Nafion. The Gamry Framework allowed us to obtain Bode, Nyquist, and Phase angle plots which gave us access to the open circuit potential, solution resistance, frequency, and corresponding impedance values. The electrochemical impedance focused research gave us insight into the polymers' durability, adhesion and likelihood of protecting a glucose sensor if implanted in the human body.

Mr. Travis Van Leeuwen, Mr. Kevin Miranda, California State University Northridge

“Rechargeable Metal-Ion Batteries for Energy Storage”

Batteries are one of the most efficient forms of electrical energy storage, with a roughly 90% rate of return, and have emerged as the most popular form of storage for consumers and industries. As a result, low cost and high safety are primary concerns for any new battery technology that hopes to penetrate the market. The experiments in this project focused on rechargeable metal-ion batteries consisting of inexpensive materials with an output of 2.6 V. Battery test cells were assembled using copper and magnesium metal plates for electrodes. Magnesium sulfate, aluminum sulfate, acetic acid, and distilled water were used as electrolytes. A cellulose cotton material was used as a matrix to contain the electrolyte and antifreeze inhibitor. The aluminum sulfate electrolyte met the 2.6V requirement with and without the inhibitor applied, and the acetic acid electrolyte met the 2.6V requirement only when the inhibitor was applied. Storing electrical energy in temporary and long-term formats is becoming increasingly important as new technologies rely more heavily on such storage devices for power and fuel.

WHERE:	CSUN University Student Union, Santa Susana Room 18111 Nordhoff St Northridge, CA 91330 (Parking: G3 or G4 Parking Lots – Off Zelzah Ave., \$6) http://www.csun.edu/csun-maps http://usu.csun.edu/about/hoursmaps.php
TIME:	6:00pm – Executive Board Meeting 6:30pm to 8:30 – Presentation
WHEN:	Thursday, 14 November 2013
COST:	Free. Sandwiches and Drinks will be provided
RSVP / Questions:	Ken Davis Ken.Davis@EngineersCouncil.org

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