

Bavarian's group Research projects: Summer 2016

Program will start: June 6, 2016 till August 12, 2016 (~15 hrs per week, minimum three days/wk)

For more information please call (818)677-7746, (Prof. L. Reiner or Prof. B. Bavarian) or Visit us in JD1130 during weekday M-F

Application of Aluminum alloys for Aircraft Applications

RESEARCH OBJECTIVES

Investigate mechanical and corrosion behavior of high strength aluminum alloys used in aircraft industry. Fellow researchers will be trained to prepare samples, use universal test equipment, microscope, and do metallographic analysis. Students will explore the effects of different heat treatment conditions on alloy performance. Materials characterization will be conducted using SEM/EDAX analysis.

Corrosion Protection of Steel pipes/ concrete Structures Using corrosion Inhibitors

RESEARCH OBJECTIVES

AIMS² students will use different corrosion inhibitors to protect steel alloys in highly corrosive environments. They will do literature research, look at material selection, and test corrosion inhibitors using potentiostatic, potentiodynamic and EIS impedance measurements. Students will be trained to use equipment, do analysis and prepare testing samples.

Rechargeable Metal-Ion Batteries for Energy Storage

RESEARCH OBJECTIVES

AIMS² students will work on rechargeable metal (Li, Mg, or Na) ion batteries for energy storage focusing on materials, modeling, simulation and electrochemistry. They will be involved in literature research initially and then selection and fabrication of electrodes, materials characterization of multiple nanocompounds using x-ray photoelectron spectroscopy (XPS), AFM and FESEM/EDAX. In several of the tasks for this proposal, the anodes and cathodes will be put through a battery of electrochemical techniques using methods such as galvanostatic (double pulse), potentiostatic, potentiodynamic (CV) and EIS impedance measurements at varying temperatures. From these tests and other physical and chemical calculations, determinations of discharge voltages, discharge and charging rates, electrode capacity, cycling life and safety can be determined. Also significant to the project is a better understanding of the underlying mechanisms and reaction paths.