Corrosion of Steel by Lead Bismuth Eutectic: Quarterly Report August September October 2002

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We gave a presentation and research review to Bill Magwood on August 20. The presentation was given by Dan Koury and Allen Johnson.

We continued with sputter depth profiling of 316 and 316L steel samples that have been exposed to LBE. We also calibrated the sputter depth profiling using a sample of SiO2 on Si, and the SEM. This is a valuable independent determination of the thickness of oxide layers.

We carried out major maintenance to keep the XPS machine running.

In August, we attended an international LBE meeting, held at UNLV. We met worldwide collaborators, and gave a tour of the material science facilities. Dale Perry attended, as did Ning Li of Los Alamos.

Physics graduate student Brian Hosterman became familiar with laser Raman spectroscopy, and for the first time examined the Raman spectrum of a standard of iron oxide. Hosterman discovered he needed to improve the suppression of stray light in the Raman spectrometer.

Dan Koury continued to work on writing his masters thesis. Drafts of the thesis have been circulated to members of his graduate committee (Farley, Johnson, Perry, physics prof Andrew Cornelius). Koury has received feedback from the committee members and has modified the thesis accordingly.

In the laboratory, progress continues using the XPS machine. Experiments have been performed on steel samples using Argon ions to mill away the surface of the sample, thereby making measurements as a function of depth. This "ion beam milling" proceeds slowly through the oxide layer that covers the steel sample. We are making measurements of samples with apparently quite thick oxide layers. We cannot mill any faster without causing damage to the vacuum pumps of the XPS instrument.

In October there was one presentation at a professional conference, and one internal talk.


Dan Koury gave a presentation on Oct 31 to his instructor and classmates in Physics 796 (Graduate Seminar). The talk was based on his thesis research, and is the first oral presentation of his thesis work.