Lead Author: Steven Goltra

Major: Chemical Engineering

College: Engineering

Co-author(s): Eyosias Mesgina, Alexander Jalbuena

Faculty Mentor(s): Dr. Vilupanur Ravi

Presentation Type: Poster Presentation

Project Title: High Temperature Oxidation of Aluminized Steels

Synopsis: The purpose of this research is to examine the effectiveness of aluminide diffusional coatings against high temperature oxidation in metallic alloys.

Abstract: The oxidation of metallic alloys at high temperatures is encountered in many industrial processes. One of the approaches to defend against high temperature oxidation is by using protective coatings, e.g., aluminide diffusional coatings. In this project, the initial and later stages of oxidation in plain carbon steels were studied in a broad temperature and time interval range. The coatings were applied using a halide activated pack cementation process and uncoated samples were also studied to provide a comparison baseline. The characterization tools utilized were spectral reflectometry and X-ray diffraction (surface characterization) and cross-sectional analysis using optical and scanning electron microscopy coupled with energy dispersive spectroscopy. These methods were used to determine the composition of the oxide film as well as to understand the oxide growth and microstructural changes due to the interdiffusion of the coating element(s) into the substrate. Results of this characterization will be presented and discussed.