Announcing the Final Examination of Robert Draper for the degree of Master of Science

Time & Location: October 18, 2013 at 2:00 PM in Surface Engineering and Nanotechnology Lab 152
Title: Novel Nanostructures And Processes For Enhanced Catalysis Of Composite Solid Propellants

The purpose of this study is to examine the burning behavior of composite solid propellants (CSP) in the presence of nanoscale, heterogenous catalysts. The study targets the decomposition of ammonium perchlorate (AP) as a key component in the burning profile of these propellants, and seeks to identify parameters of AP decomposition reactions that can be affected by catalytic additives.

The decomposition behavior of AP was studied in the presence of metal oxide nanoparticles in varying configurations, surface conditions, dopants, morphology, and synthesis parameters with the AP crystals. The catalytic nanoparticles were found to alter the burning profile, enhance the decomposition rate of the ammonium perchlorate, and promote an accelerated burning rate of CSP propellants containing the additives. Furthermore, different configurations were shown to have varying degrees of effectiveness in promoting the decomposition behavior.

Major: Materials Science

Educational Career:
Bachelor's of Mechanical Engineering, BS, 2012, University of Central Florida

Committee in Charge:
Sudipta Seal, Chair, Materials Science
Helge Heinrich, Physics
Lei Zhai, NSTC

Approved for distribution by Sudipta Seal, Committee Chair, on October 6, 2013.

The public is welcome to attend.