



Alabama Research Experiences for Undergraduates (ALREU)

Project Title:

Evaluating Low Temperature Plasma for the Production Agricultural Fertilizer

Project Reference Code:

AAMU-Cebert

Hosting Institution:

Alabama A&M University

Hosting Institution Location:

Huntsville, AL

Project Description:

More than a century since the Haber-Bosch process was commercialized, it is still the primary means by which current agricultural fertilizer is produced, where nearly 2% of the world energy is used for the procedure. Increasing use of these traditional fertilizer protocols to sustain the growing human population is also problematic to the environment in the form of eutrophication to hypoxia. Modernization of the century old Haber-Bosch process for the production of fertilizer is crucial. Therefore, the application of plasma, the 4th state of matter to create a modern environmentally acceptable process for agricultural fertilizer will be explored by subjecting various inert, organic, granular limestone and phosphate rock to low temperature plasma (LTP).

Objectives:

The approach for this project will consist of generating LTP using mixed variations of gases (Nitrogen, Hydrogen, Oxygen etc.) in combination with other reactive materials plus the aforementioned base-fertilizer products. Treated products will be examined for essential components including Nitrogen, Phosphorous, Potassium and required elements for crop growth. The effectiveness of these products for crop production compare to traditional Haber-Bosch produced fertilizer will be analyzed.

Disciplines: Agricultural Production

U.S. citizenship required to participate in this project.

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The name and contact information of personnel at the hosting institution is provided for further assistance with questions regarding the hosting institution or the project.

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