



Alabama Research Experiences for Undergraduates (ALREU)

Project Title:

Plasma-catalysis effects on LCF Perovskite Ion Transport Membrane processing of CH₄

Project Reference Code:

UA-Uddi

Hosting Institution:

University of Alabama-Tuscaloosa

Hosting Institution Location:

Tuscaloosa, AL

Project Description:

Plasma-Catalysis: study the Plasma-Catalysis (PC) effect of non-equilibrium low temperature plasma on ceria nano-catalysts to produce different chemicals (syngas- CO+H₂) using CO₂, CH₄, air as feedstock, at 1 atm pressure, in the temperature range 400-900 C, through experiments. The effect of plasma on the surface reactions is to be studied.

Method: Assemble a home built reactor to test ceria nano-powder with RF discharge will be used. Various types of optical/ laser diagnostics of the plasma-surface interaction will be done. Optical diagnostics includes plasma emission spectroscopy, plasma imaging with high speed ICCD camera, PLIF- Planar Laser Induced Fluorescence etc. The exhaust gases will be analyzed for temporal species composition using a Quadrupole Mass Spectrometer (QMS).

Disciplines:

Chemistry, Math, Engineering

U.S. citizenship required to participate in this project**Name(s) of Mentor(s) and contact information:**

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

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