



Alabama Research Experiences for Undergraduates



Project Title:

Study the Effect of LTP on Nano Powders for Polymer Composite Applications

Project Reference Code:

TU-Rangari

Host Facility:

Tuskegee University

Host Facility Location:

1200 W. Montgomery Rd.

Tuskegee, AL 36088

<https://www.tuskegee.edu/>

Project Description:

Plasma, due to its ability to interact with matter at nano and meso scales it can be used as a tool to alter surface properties of various nanomaterial materials including carbon. These treatments can not only achieve desired surface properties by changing the functional group densities but also alter the crystallinity of material. The focus of this work is to study the effects of plasma treatment on in-situ synthesized carbon from various renewable sources and other food waste materials. Effect of various parameters like type of gas (SF₆, O₂, Ar and Air), plasma density, electromagnetic radiation and flux of ionized matter on the surface properties of the material will be studied. The materials characterization techniques will include spectroscopic and microscopic. The preliminary study shows that the plasma treatment effect in altering the surface interactions of nanomaterials with other materials, which would be otherwise, achieved through rigorous chemical and physical modifications. These nanoparticles will be infused into polymer to study the morphological, thermal and mechanical effect on its polymer composites.

Disciplines:

Material Engineering, Polymer Composites

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

Yes

Name(s) of Mentor(s) and contact information:

Vijay Rangari (vrangari@tuskegee.edu)

Internship Coordinator/ HR manager:

Shirley F. Brown (sbrown@mytu.tuskegee.edu)

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

Interns will not enter into an employee/employer relationship with the host facility. No commitment with regard to later employment is implied or should be inferred.