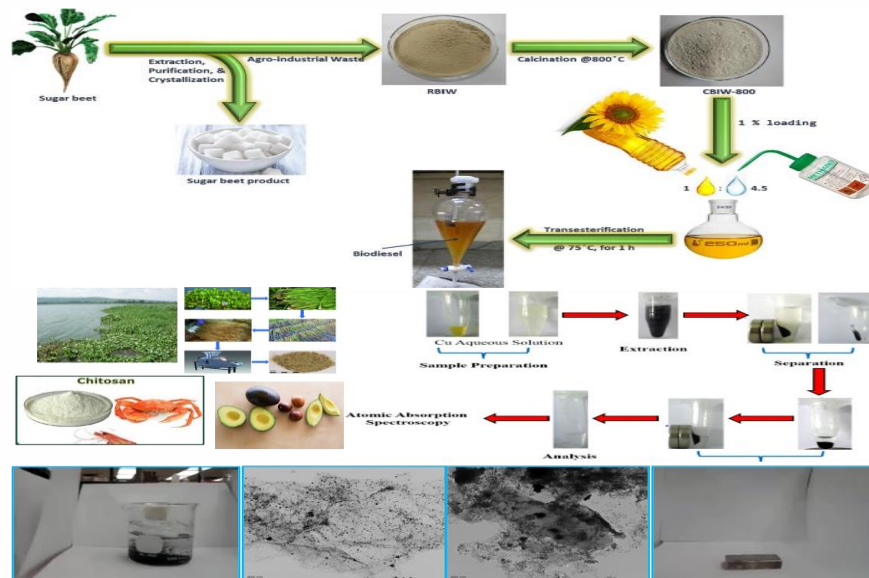


# DEPARTMENT OF CHEMICAL AND BIOCHEMICAL ENGINEERING

## Applied Catalysis and Sustainability

### Research Topics:

- ❖ Carbon Management (CCUS): Carbon capture, utilization, and storage.
- ❖ Nano-structured materials.
- ❖ Carbon based materials including Graphene, Carbon Nanotubes, etc.
- ❖ Micro reactors.
- ❖ Heterogeneous catalysis.
- ❖ Synthesis and Characterization of Nanoparticles for Applications in Catalysis.
- ❖ Transition metal catalysis including Palladium based catalyst systems.
- ❖ Cross-coupling reactions for batch and continuous operations.
- ❖ Metal nanoparticles supported on novel carbon-based platforms such as Graphene.
- ❖ Synthesis of Graphene based Palladium/magnetite catalyst under batch/flow reaction conditions.
- ❖ Flow reactor technology for Suzuki cross – coupling reaction used in pharmaceutical industry.
- ❖ Separable magnetic catalyst.
- ❖ Metal oxides nanoparticles on different supports for wastewater treatment.
- ❖ Biomass conversion and Biodiesel.
- ❖ Microwave-assisted synthesis.



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Funding:

Missouri University of Science and Technology



### Keywords:

Sustainability, Nanotechnology, Graphene, Heterogeneous catalysis, Magnetic Nanoparticles, Microwave-assisted Synthesis, Micro Reactor Technology, Chemical Reaction Engineering, Chemical Kinetics, Flow Chemistry, Metal Oxides, Cross-coupling Reactions.

### Significant achievements:

- ❖ Distinguished Research Award, BUE, EGYPT, 2020.
- ❖ Early Research Career Award (RAW2), BUE, EGYPT, 2019.
- ❖ High Impact Research Award (RAW3), BUE, EGYPT, 2018.
- ❖ Distinguished Scholar, Egypt, 2013.