

FOSSIL FUEL RESEARCH LABORATORY

USPCAS-E recognizes the use of fossil fuels will continue to be significant for some time. Therefore, they must be transformed through the Reforming and Pyrolysis process. To achieve this end, a state-of-the-art fossil fuel lab facility has been established here. The Lab went operational on March 2017, and has been part of different collaborative projects with industries as well as other educational institutions. Recently, Fossil Fuel Lab has been working on an R&D project in collaboration with UNIDO. These projects are primarily related to energy-efficiency improvement in the industrial sector of Pakistan. The aim of this lab is to equip the students with research skills in fossil fuels industry and solve the industrial issues specifically from petroleum refineries and power plants.

LAB MISSION

Hands-on activities and background information that introduce students to fossil fuels and the processes involved in creating many of the products that are environment-friendly. Students will learn different techniques to characterise the quality of fuel and their impact on the socio-economic landscape of the country.

RESEARCH PORTFOLIO

Thermal Fluid Sciences, Reforming technologies for green fuels, Thermal catalysis, Preparation and utilization of clean coal/biomass for power generation



RESEARCH EQUIPMENT

Equipment	Description	Specification
Thermal Gravimetric Analysis (TGA)	Analyze Thermal stability of the materials by measuring weight loss with respect to temperature rise.	Temp Range: Amb-1200 °C Heating Rate: 0.1-500°C/min Environment: N ₂
Ash Fusion Determinator	Determines the Fusion Temperature of the Biomass and Coal Samples	Max Temp Limit: 1500 °C Environment: Oxidizing and Reducing
Carbon, Hydrogen, Nitrogen and Sulphur Analyzer	Elemental Analysis of Biomass and Coal Samples by % quantification of C, N, H, S.	Analysis Time: 4-6 mins Gas Required: He, O ₂ , N ₂ Temp Range: 1050 °C
Tabular Fluidized Bed Reactor	Converts gaseous fuels to Liquid fuels: Syn Gas to Ethanol	Max Pressure: 3000 psi Max Temp: 900 °C
Pulverizer	Size Reduction of Biomass and Coal Samples	Capacity: 400 g/min Pulverization: -4 mesh to -60 mesh size
Sieve Shaker	Differentiates Sample into Different Particle Size	2 inch down through 635 mesh
Grinding Machine	Grinds the Sample using Steel Balls	Working Revolution: 60r Feed Size: 0.63-1.25mm Bowl Capacity: 50g
High Performance Oven	Remove Moisture from the samples	Max Temp: 250 °C

