Contribution ID: **60** Type: **Oral Presenter**

Process Optimization of Microwave Assisted Co-prolysis of Coal and Oil Palm Shell Blend with Carbon Surfaces

The energy insecurity and CO2 emissions from fossil fuel utilization demands sustainable and cleaner fuel resources. Bio-fuels and chemicals from waste biomass have been recognized as the renewable energy resource. Coal has the potential to become an important source for liquid and gas fuels. Co-processing of coal with waste biomass to produced fuels is considered a step towards sustainable and clean coal utilization. In this study, Oil Palm Shell (OPS) waste biomass and coal were subjected to Microwave (MW) co-pyrolysis conditions. The effects of process parameters on the efficiency of co-pyrolysis blended fuel were tested to identify the optimal processing conditions. The results of this study suggests that co-pyrolysis blended fuel over 35-55-75wt% carbon loading with 3-Layer method at 600W and 4LPM of N2 flow rate suggests that increasing the carbon loading increases the oil yield. This suggests that experimental design space for carbon loading can be narrowed down. Therefore, 55wt% carbon loading was selected as the minimum and 75wt% carbon loading as the maximum range. The levels of MW selected power were 600-720W, where the highest is based on the maximum rated capacity of multi-mode MW oven (i.e. 800W). The response surface methodology was used to establish model yields. The co-pyrolysis oil obtained under various MW operating conditions was analyzed using GC-MS for chemical composition. The process temperature of blended fuel solids with 3-Layer method were recorded by online thermocouples and discussed.

Author: Dr MUSHTAQ, Faisal (Balochistan University of Information Technology, Engineering and Management Sciences (BUITEMS), Quetta, Pakistan.)

Co-authors: Dr MAT, Ramli (Universiti Teknologi Malaysia, Malaysia); Prof. NASIR ANI, Farid (Universiti Teknologi Malaysia, Malaysia)

Presenter: Dr MUSHTAQ, Faisal (Balochistan University of Information Technology, Engineering and Management Sciences (BUITEMS), Quetta, Pakistan.)

Session Classification: Chemical Engineering

Track Classification: Chemical & Material Engineering