IEM
The Institution of Engineers, Malaysia

WEBINAR TALK ON BIOCHAR PRODUCTIONS: PRINCIPLES AND PRACTICES

ORGANISED BYAGRICULTURAL & FOOD ENGINEERING TECHNICAL DIVISION (AFETD)

DATE & TIME :
11 SEPT, 2024
(WEDNESDAY)
2.00PM TO
4.00PM

SPEAKER:
ASSOCIATE PROF DR MOHAMAD AMRAN BIN MOHD SALLEH

VENUE:
ZOOM Platform

WEBINAR AGENDA:

- INTRODUCTION TO BIOCHAR
- HISTORICAL CONTEXT AND EVOLUTION
- AGRICULTURAL BENEFITS OF BIOCHAR
- ECONOMIC CONSIDERATIONS
- PYROLYSIS PROCESS OVERVIEW
- VOLATILES AND SYNGAS PRODUCTION
- MASS AND ENERGY BALANCE ANALYSIS
- CHALLENGES IN LARGE-SCALE PRODUCTION
- INNOVATIONS IN PYROLYSIS TECHNOLOGY
- FUTURE DIRECTIONS FOR BIOCHAR STAKEHOLDERS

REGISTRATION FEES
IEM STUDENTS: FREE
IEM MEMBERS:
RM15 (ONLINE)/RM20 (OFFLINE)
NON-IEM MEMBERS: RM70

BEM APPROVED CPD/PDP HOURS: 2
REF NO: IEM24/HQ/297/T (W)

SYNOPSIS

Biochar is a carbon materials usually originated from biomass via thermal processes such as gasification and pyrolysis. Carbon residue can also be produced from other carbon based material such as municipal waste. However, by international research community standard, biochar name is strictly reserved for carbon residue produced from biomass only. The production of biochar has been around for a long time but the carbon was not necessarily called biochar and the main final product is activated carbon. Activated carbon is considerably expensive materials due to its applications in important industry and less attention was given to the production economy as long as the carbon content is satisfied.

More recently, biochar found application in other areas especially in agriculture as soil conditioner. Some evidence show the unhealthy soil can achieve certain improvement in pH level, microbial activities, and fertilizer and water retention among others. The application of biochar in soil is considered a low value due to the economy of crops productions. At the same time, the demand of the main quality of biochar which is the carbon content for soil application is not as high as for the activated carbon reflecting the selection of biomass feed. Therefore attention need to be given to the economy of the biochar production.

Pyrolysis is an endothermic process thus require certain amount of energy input. However most of the energy input is used to drive off moisture in the biomass. Most pressed biomass still contain about 70% of moisture let alone green and loose biomass which will demand more energy input. The pyrolysis process of biomass may produce volatiles and syngas which may be recycle to ease off the energy demand. The amount of syngas recovered depend on feed, process, and technology.

This talk will look at the mass and energy balance of the pyrolysis process gathered from claims in publication and also from a simple simulation. Lack of progress in biochar large scale production and some failure of gasification and pyrolysis pilot plant in the past warrant further investigation at fundamental level. Furthermore, some manufacturer claims their equipment to be self sustaining pyrolysis. Therefore this discussions will provide some guidance to biochar stakeholders moving forwards.

SPEAKERS BIODATA

Associate Prof Dr Mohamad Amran bin Mohd Salleh has more than 25 years experience in chemical engineering field primarily in teaching and R&D. His PhD focused on Defluidization in High Temperature process of polyolefin. He started biochar research in 2008 and developing three biochar pilot plants. He is also the current President of Biochar Malaysia Association which is a platform to gather biochar producers and users and thus looking to promote the use of biochar as soil improver and carbon sink helping crops production and the environment in the long term.

He has a PhD of Chemical Engineering from Birmingham University, UK and Bachelor of Chemical and Biochemical Engineering from Western University, Canada. He has published more than 100 publication which receive more that 5500 citations putting him in the world top 2% lifetime scientist based on citations received.