

Quality enhancement of bio-oil produced from corncob pyrolysis

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Abstract

India is the one of the major producers of corn with an average productivity of 2.4 tons per hectare. Large number of corncobs are available as biomass residues for renewable energy production. In this study, corn cob was characterized through FTIR and TGA analysis, followed by fast pyrolysis in a fixed bed pyrolysis reactor at 550 °C to get bio-oil and char. Yield was estimated and different characterization techniques were used to check the quality of bio-oil, which is a viscous dark brown liquid and an alternative potential energy source. After experimental test of bio-oil, bio-oil was a viscous dark brown liquid having pH of 2.72, water content 12%, viscosity 2.61 mm²/s and density 0.8851 gm/cm³. Bio-oil quality have always been a major issue in the past because of the presence of moisture and phenolic compounds and makes it difficult to use directly in motor engines. The phenolic components were eliminated from the bio-oil using NaOH (10 wt.%) and diethyl ether. After the removal of the solvent under reduced pressure, the bio-oil was found to possess better organic compounds having lower phenolic compounds and pH value. The characterization of Bio-oil has been done by using GC- MS, FTIR, Pour Point, Density, pH as compared to original one. Therefore, through the use separation procedure the bio-oil property can be improved.

Biography

Aakash Malik is an undergraduate student in the Chemical Engineering program at the University of Petroleum and Energy Studies, India and will be graduating in June 2020 with a Bachelor of Technology in Chemical Engineering Specialization in Refining and Petrochemicals. Aakash has a strong interest in the field of biomass-based energy solutions and drug solubility enhancement.



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