

Biofuel from Rice Husk Pyrolysis: Effect of Temperature to Pyrolysis Oil and Its Kinetic Study

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Abstract

rice husk is counted as an agricultural waste that results in environmental problems during its handling. In this work, rice husk was used as raw material for producing liquid biofuel (pyrolysis oil) via pyrolysis. The pyrolysis reaction was carried out at temperatures of 450, 500, and 550°C for 1 hour. The pyrolysis oil was collected and weighted for every 10 minutes. The results showed that the increase in pyrolysis temperature caused the yield of pyrolysis oil to increase. The properties in the term of heating value also increased while viscosity and density of pyrolysis oil decreased. These properties were almost similar to diesel oil with a slightly lower heating value. The proposed model using the single reaction model and two stages model were fit to represent the mechanism of rice husk pyrolysis reaction in this study. However, the results of two stages model gave a lower error than those of the single reaction model. Furthermore, the rate of pyrolysis reaction at various temperatures could be determined using the kinetic data obtained from the developed model. This information would be useful for designing the pyrolysis reactor especially for producing biofuel (pyrolysis oil) from the rice husk.

Keywords

Rice husk ; Pyrolysis ; Pyrolysis oil ; Temperature ; Kinetics

Main Subjects


Catalysts, Kinetics, Reactor ; Energy, Heat Transfer ; Green Chemistry, Sustainable Chemistry|


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