

## Optimization of Reaction Parameters' Influences on Production of Bio-Oil from Fast Pyrolysis of Oil Palm Empty Fruit Bunch Biomass in a Fluidized Bed Reactor

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**Abstract :** Oil palm mills in Southern Thailand produced a large amount of biomass solid wastes. Lignocellulose biomass is the main source for production of biofuel which can be combined or used as an alternative to fossil fuels. Biomass composed of three main constituents of cellulose, hemicellulose, and lignin. Thermochemical conversion process applied to produce biofuel from biomass. Pyrolysis of biomass is the best way to thermochemical conversion of biomass into pyrolytic products (bio-oil, gas, and char). Operating parameters play an important role to optimize the product yields from fast pyrolysis of biomass. This present work concerns with the modeling of reaction kinetics parameters for fast pyrolysis of empty fruit bunch in the fluidized bed reactor. A global kinetic model used to predict the product yields from fast pyrolysis of empty fruit bunch. The reaction temperature and vapor residence time parameters are mainly affected by product yields of EFB pyrolysis. The reaction temperature and vapor residence time parameters effects on empty fruit bunch pyrolysis are considered at the reaction temperature in the range of 450-500°C and at a vapor residence time of 2 s, respectively. The optimum simulated bio-oil yield of 53 wt.% obtained at the reaction temperature and vapor residence time of 450°C and 2 s, 500°C and 1 s, respectively. The simulated data are in good agreement with the reported experimental data. These simulated data can be applied to the performance of experiment work for the fast pyrolysis of biomass.

**Keywords :** kinetics, empty fruit bunch, fast pyrolysis, modeling

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