

A review of pyrolysis of oil palm empty fruit bunches (EFB) to produce bio-energy productions

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ABSTRACT

Pyrolysis is a thermochemical conversion technology of biomass feedstock to produce bio-energy and chemicals in the absence of oxygen. Biomass pyrolysis can be classified into three main categories, which are slow, fast and flash pyrolysis, depending on heating rate and residence time. The bio-products of this process consist of bio-char, biooil and bio-syngas. The yield of these products is affected by operating conditions of the process, such as temperature, heating rate, reaction time, pressure, gas flow rate, feed rate, particle size and feedstock composition. Oil palm empty fruit bunches (EFB) were studied in this review as a biomass feedstock of the pyrolysis process, because it is abundance in Malaysia. Malaysia is considered the second largest producer of palm oil in the world. EFB has been used as a potential alternative of bio-energy sources to reduce negative environmental impact of global warming, due to its environment-friendly nature. This study reviews the summary of new studies on pyrolysis process of EFB to produce bio-energy and chemicals. The paper also presents the detail of a composition of EFB, the process design and classification, operating condition that affects the process, the reactors, and various products and its applications.

KEYWORDS

Biomass; Empty Fruit Bunch (EFB); Pyrolysis; Bio-products; Reactor

ACKNOWLEDGEMENT

The author gratitude goes to the Research and Innovation Department, Universiti Malaysia Pahang, Malaysia, for their financial support through the Master Research Scholarships (MRS), and Postgraduate Research Grants Scheme (PGRS).