Perbandingan Yield dan Komposisi Bio-oil Hasil Slow Co-pyrolysis Polipropilena-Trigliserida dengan Polipropilena-Bonggol Jagung = Comparison between Bio-oil's Yield and Composition of from Co-pyrolysis Polypropylene-Triglyceride and Polypropylene-Corn Cobs

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Abstrak

Minyak kelapa sawit memiliki potensi yang tinggi untuk dikembangkan menjadi bio-oil oleh karena kandungan trigliserida. Indonesia merupakan negara produsen kelapa sawit terbesar di dunia. Selama ini minyak kelapa sawit belum dimanfaatkan secara maksimal khususnya sebagai bahan baku industri. Padahal minyak kelapa sawit dapat dimanfaatkan sebagai energi terbarukan melalui proses slow co-pyrolysis. Dalam penelitian ini, trigliserida yang digunakan dari minyak goreng kelapa sawit. Selain itu, limbah plastik juga berlimpah di Indonesia, terutama plastik polipropilena. Tujuan penelitian ini adalah untuk mengetahui pengaruh laju oenambahan plastik polipropilena terhadap yield dan kualitas bio-oil hasil slow co-pyrolysis minyak kelapa sawit. Penelitian ini dilakukan dalam reactor tabung berpengaduk pada suhu 550oC, heating rate 5oC/menit, kecepatan pengaduk 65 RPM dengan laju alir gas nitrogen 550 mL/min. Variasi yang dilakukan berupa penambahan jumlah % massa plastik polipropilena yang akan mempengaruhi yield dan komposisi dari bio-oil yang dihasilkan. Bio-oil dikarakterisasi dengan menggunakan GC-MS, dan FTIR. Efek sinergetik pada pirolisis PP-trigliserida tidak terjadi, sedangkan pada pirolisis PP-bonggol jagung terjadi saat komposisi PP 50% dan 75%. Bio-oil optimum dihasilkan pada komposisi PP 75% baik pada pirolisis PP-trigliserida dan PP-bonggol jagung.
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Palm oil has high potential to be developed into bio-oil because of the content of triglycerides. Indonesia is the largest palm oil producer in the world. So far, palm oil has not been fully utilized, especially as an industrial raw material. Even though palm oil can be used as renewable energy through the slow co-pyrolysis process. In this study, the the triglyceride is from palm oil cooking oil. In addition, plastic waste is also abundant in Indonesia, especially polypropylene plastic. The purpose of this study was to determine the effect of the rate of addition of polypropylene plastic on the yield and quality of bio-oil produced by slow co-pyrolysis of palm oil. This research was conducted in a stirred tube reactor at a temperature of 550oC, heating rate of 5oC / minute, stirrer speed of 65 RPM with a nitrogen gas flow rate of 550 mL / min. The variation is in the form of increasing the mass% of polypropylene plastic which will affect the yield and composition of the bio-oil produced. Bio-oil is characterized by using GC-MS, and FTIR. The synergetic effect on PP-triglyceride pyrolysis did not occur, whereas in the pyrolysis of PP-corn hump occurred when the composition of PP was 50% and 75%. Optimum Bio-oil was produced in the composition of PP 75% both in PP-triglyceride pyrolysis and PP-corncobs.<i/>