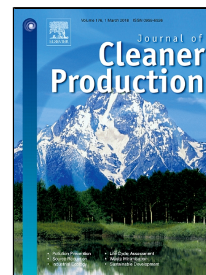


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Microwave-assisted Production of Optimized Pyrolysis Liquid Oil from Oil Palm Fiber

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Abstract

This study highlights the microwave-assisted optimization on the production of pyrolysis liquid oil (PLO) from oil palm fiber (OPF) focusing on the liquid oil yield and the concentration of total phenolic content (TPC). Final temperature (400-600 °C) and AC loading (50-100 g) showed significant effects on the PLO yield and TPC concentration, compared to the holding time (15-30 min), as verified by using response surface methodology (RSM) via central composite design (CCD) approach. The TPC concentration is highly important for biomedical applications such as antioxidant and antimicrobial agent that will be presented in the future work. At optimum condition, highest PLO yield determined was 40.66 wt % together with 26.61 ± 0.96 mg gallic acid/g of TPC concentration. The major composition (73.4%) of concentrated pyrolysis liquid oil (CPLO) consisting of phenolic compound and its derivatives has been observed via GCMS analysis. Thus, this study successfully demonstrated the potential utilization of OPF as one of the sustainable feedstocks for the production of PLO.

Keywords: Pyrolysis liquid oil, microwave pyrolysis, oil palm fiber, fast pyrolysis, phenolic content

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