Presentation code:
E21

Preliminary Study on Supercritical Fluid Extraction Of Microalgae *Nannochloropsis Salina*

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Abstract. Supercritical Fluid Extraction (SFE) is an emerging extraction method because it is clean, selective and efficient compared to the chemical extraction methods that use toxic solvent. Microalgae Nannochloropsis salina was selected as the feedstock in this study due to its high content of Polyunsaturated Fatty Acids (PUFA). The use of carbon dioxide (CO_2) as a solvent in SFE makes the process as one of the green extraction technologies. This study aims to observe the effect of co-solvent (5% ethanol) and different types of microalgae holder (cotton and steam bun cloth) on the yield of lipid. The holder is required during the process due to the fine particle of microalgae that has potential to clog the instrument. The study was conducted for 4 hours at 60°C, 30 MPa and flow rate of 4 ml/min. The obtained lipid was then transesterified and analyzed for fatty acid methyl ester (FAME) profile. The results showed that high yield of lipid (16 wt.%) obtained when co-solvent was added during the SFE. The microalgae holder used in this study also affected the yield of lipid. The used of cotton cloth as microalgae holder for SFE with co-solvent gave high lipid yield compared to steam bun cloth. It was found that the yield of lipid from SFE was double the amount of lipid obtained using Soxhlet extraction. This preliminary findings can be further researched by optimizing the co-solvent concentration with suitable microalgae holder for high lipid yields.

Keywords: microalgae, biomass, extraction, lipid