

Accepted Manuscript

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Authors: J.-L. Zheng, P. Tolvanen, B. Taouk, K. Eränen, S. Leveneur, T. Salmi



PII: S0263-8762(17)30710-4
DOI: <https://doi.org/10.1016/j.cherd.2017.12.037>
Reference: CHERD 2962

To appear in:

Received date: 23-5-2017
Revised date: 28-11-2017
Accepted date: 19-12-2017

Please cite this article as: Zheng, J.-L., Tolvanen, P., Taouk, B., Eränen, K., Leveneur, S., Salmi, T., Synthesis of carbonated vegetable oils: investigation of microwave effect in a pressurized continuous-flow recycle batch reactor. *Chemical Engineering Research and Design* <https://doi.org/10.1016/j.cherd.2017.12.037>

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Synthesis of carbonated vegetable oils: investigation of microwave effect in a pressurized continuous-flow recycle batch reactor

J.-L. Zheng ^{a, *}, P. Tolvanen ^b, B. Taouk ^a, K. Eränen ^b, S. Leveneur ^{a, b*}, T. Salmi ^b

^a Normandie University, INSA Rouen, UNIROUEN, Laboratoire de Sécurité des Procédés Chimiques LSPC, EA4704, FR-76000 Rouen, France ; Email: junliu.zheng@insa-rouen.fr; sebastien.leveneur@abo.fi

^b Åbo Akademi University, Johan Gadolin Process Chemistry Centre, Laboratory of Industrial Chemistry and Reaction Engineering FI-20500 Åbo/Turku, Finland; Email: sebastien.leveneur@abo.fi

Highlights

- A microwave-assisted continuous-flow recycle batch reactor for gas-liquid reactions
- Investigation of microwave effect on the carbonation of cottonseed oil methyl ester
- Kinetic modeling for comparison between conventional and microwave heating
- A minor decrease in reaction activation energy under microwave

Abstract:

With the depletion of fossil resources, it is essential for the chemical industry to find alternative raw materials for polymers. Polyurethanes can be synthesized from vegetable oils and CO₂ via an environmentally friendly, non-isocyanate pathway. Carbonation of epoxidized vegetable oil is a key step allowing the feasibility of this method. Because it requires a high temperature, high pressure and long reaction time to achieve complete conversion, microwave technology (MW) is an interesting approach for the intensification of the carbonation process. However, MW-irradiated batch reactor has multiple issues

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