

THERMAL STABILITY OF REACTION MEDIUM OF THE TRANSESTERIFICATION OF *Jatropha curcas* L. OIL AT SUPERCRITICAL CONDITIONS

Camila da Silva^{(1)(2)*}, Vitor Augusto dos Santos Garcia⁽³⁾, José Vladimir Oliveira⁽⁴⁾
Vladimir Ferreira Cabral⁽¹⁾ and Lúcio Cardozo Filho⁽¹⁾

(1) Department of Chemical Engineering, Maringa State University (UEM)
Av. Colombo 5790 Maringa, PR, 87020-900, BRAZIL

(2) Department of Technology, Maringá State University (UEM)
Umuarama, PR, 87506-370, BRAZIL

(3) Department of Food Engineering, University of São Paulo (USP)
Av. Duque de Caxias Norte 225, Pirassununga, SP, 13635-900, BRAZIL

(4) Department of Food Engineering, Santa Catarina Federal University (UFSC)
C.P. 476, Florianópolis, SC, 88040-900, BRAZIL

The reaction for biodiesel production at supercritical conditions requires high alcohol to oil mass ratios and the adoption of high temperatures and pressures for the reaction to present satisfactory conversion levels, leading to high processing costs and causing in many cases the degradation of the fatty acid esters formed and reaction of glycerol formed with other components of the reaction medium, hence decreasing the reaction conversion. In this context, the main objective of this work is to investigate the thermal stability of ethyl esters from *Jatropha* oil and glycerol under supercritical conditions in a continuous mode. For this purpose it was assessed the effects of temperature in the range of 548 K to 598 K and water concentration of 0 wt% to 10 wt% (added to anhydrous ethanol) at 20 MPa, oil to ethanol mass ratio of 1:1 for different residence time. The thermal stability of glycerol was available in different conditions of temperature and glycerol to ethanol mass ratio. The compounds formed from decomposition of constituents of the culture broth were identified. The results demonstrate that the temperature favors the formation of degradation compounds in the ethanolysis reaction of *Jatropha* oil and the greater amount of water in the reaction medium decreases the decomposition. In experiments with glycerol and ethanol is observed decrease in the concentration of glycerol with increasing temperature and decreasing mass ratio.

Keywords: *Jatropha* oil, glycerol, supercritical method, biodiesel.

*Corresponding author: camiladasilva.eq@gmail.com