

## **Liquid-Liquid Equilibria of the Systems Methanol/Sunflower Oil and Biodiesel/Glycerol**

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Transesterification of the vegetable oils is the simplest chemical reaction in the industrial process used to produce biodiesel. This reaction involves an alcohol reacting, in presence of a catalyst, with the triacylglycerols contained in vegetable oils or animal fats to produce a liquid mixture of mono-esters and glycerol. The reacting mixture has to be treated to separate, biodiesel, glycerol, the unreacted methanol and other chemical compounds produced in the process. The optimization of the entire production process requires the correct understanding of the phase equilibria of the systems involved. In this work liquid-liquid equilibria were determined experimentally for the binary systems biodiesel+glycerol and biodiesel+water. The experimental data obtained are then correlated with original UNIFAC-LLE model, to evaluate the capability of prediction of the model. The experimental data were also correlated with UNIQUAC model, to calculate the binary interactions parameters of the systems under investigation. The binary interaction parameters adopted are temperature dependent and were fitted from the experimental data obtained, using MATHEMATICA® software.