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## Countercurrent supercritical fluid extraction of bioactive compounds from Rapeseed oil deodorizer distillate + modeling using the Peng-Robinson EOS

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The use of the Peng -Robinson equation with the Van der Wals mixing rules to predict the suitable supercritical extraction conditions of multiple system Rapeseed oil deodorizer distillates to do experiments was studied. This work presents the main results achieved by our research group combining chemical reaction, supercritical fluid extraction, thermodynamic phase equilibrium modeling and chemical analysis to study alternative supercritical extraction processes associated with oil-type materials. Rapeseed oil deodorizer distillates as a raw material was fractionated in a countercurrent column using supercritical carbon dioxide.to facilitate the concentration of the selected minor lipids (tocopherols and phytosterols) in the raffinate product, the raw material employed was previously saponified. Cold saponification was chosen instead of conventional saponification which is down at a temperature no lower than 60 °C to remove free fatty acids and acylglycerols. The coupling of thermodynamic modeling with experimental work has been made the analysis of extraction processes possible by low- time consumption. Recycling of phytostrols from RODD was 76% with a purity of 60% and tocopherol 85% and with a purity of 75% at 40MPa with an enrichment factor about 3 and 11.4 respectively. The results showed that there is a good agreement between calculations and experimental with average relative deviations of 2.5 prediction of concentration and the efficiency.

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