THE EFFECTS ON THERMAL BEHAVIOR, MICROSTRUCTURE AND POLYMORPHISM OF THE INTERESTERIFIED FATS FROM SOYBEAN OIL AND FULLY HYDROGENATED SOYBEAN OIL AFTER REMOVAL OF DIACYLGLYCEROLS

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Chemical interesterification is currently the main alternative for the production of plastic fats containing no trans fatty acids. During this process there is the formation of diacylglycerols, which are considered molecular agents that could affect lipid crystallization. The objective of this study was to evaluate the influence of those diglycerides on thermal behavior, microstructure, and polymorphism of interesterification of soybean oil/fully hydrogenated soybean oil blend. The original and interesterified blends without diacylglycerols were examined for triacylglycerol classes, differential scanning calorimetry (DSC), isothermal crystallization by Nuclear Magnetic Resonance Spectrometer (NMR), and X-ray diffraction. There was a reduction on the content of diglycerides from 7.6 to 2.6% during the process of removal. The values for the crystallization enthalpy of the interesterified fats before and after partial removal of diglycerides were 58.6 and 64.7 J/g, respectively. The increasing of this parameter shows evidence of the formation of a more stable crystalline polymorphic form. This evidence was confirmed by the X-ray diffraction. The NMR analysis represented an increase in solid fat content after removing the diglycerides. It was concluded that the removal of diglycerides provides the formation of more stable crystalline structures and must be taken into consideration during the industrial processing of food.