

Properties of soybean oil obtained by pressurized liquid extraction (PLE) in intermittent process using organic solvents: hexane and ethanol

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New processes have been used to extract vegetable oils in the search for extraction technologies that use green and sustainable solvents. Pressurized Liquid Extraction (PLE) in intermittent process is among these technologies. Physicochemical analyzes were performed to compare crude oils extracted with pressurized hexane (Hex) and ethanol (EtOH) with commercial oil (CO). Density and viscosity were evaluated at 25 and 40°C. The free fatty acid (FFA) content was evaluated using titration with NaOH. For the determination of FFA, the samples were neutralized and saponified, the saponified portion was analyzed by GC-MS. The induced oxidation of the oil was measured by the induction period (IP) exposing the oil to 120°C and air flow of 15L/h. The density did not change, regardless of the solvent. The viscosity of the oil extracted with Hex (47,764 mPa.s and 27,284 mPa.s) was similar to that of CO (49,474 mPa.s at 25°C and 28,407 mPa.s at 40 °C) and was higher than that extracted with EtOH (24,543 mPa.s. s and 14,756 mPa.s). Data at 40°C were lower than 25°C for all samples. The FFA content for the oil extracted with Hex was 2.12 ± 0.02 , with EtOH it was 2.11 ± 0.01 and for CO it was 0.32 ± 0.02 . The main FFA identified for both oils were linoleic followed by oleic and palmitic. The oil extracted with Hex presented an IP of 8.38h, and the oil extracted with EtOH 0.21h. The CO presented IP 5.66h. The result showed that the extraction methods do not interfere with the oil density. However, the oil extracted with EtOH showed lower viscosity. Oxidation of the oil extracted with EtOH was faster than that of Hex oil. If the acidity was the same for both oils, then the oil extracted with EtOH likely extracts compounds that accelerate oxidation when exposed to oxygen.