

Deoiling spent bleaching clays from edible oil refining industries by supercritical CO₂

P. Subra Paternault, C. Harscoat Schiavo, M. Brun, R. Savoire

Université de Bordeaux, CNRS, Bordeaux INP, Laboratoire CBMN UMR 5248,
Avenue Geoffroy Saint Hilaire 33600 Pessac, FRANCE
p.subra-paternault@cbmn.u-bordeaux.fr

Bleaching is an adsorptive cleansing process used in the edible oil refinery to remove components that adversely impact the quality and stability of oils. Bleaching materials used in oil processing are mostly natural earths or acid-activated bentonite. At the end of the bleaching operation, spent bleaching earths (SBE) contain 20-40% of residual oil and pigments, soaps, oxidation products and trace metals. Due to the high oil content of SBE, its disposal can cause environmental hazards since it is prone to spontaneously ignite in presence of oxygen.

This work investigates the use of supercritical CO₂ to de-oil SBE as a first step of their regeneration. Two industrial SBE were treated at 45°C 23 MPa varying flow rate, temperature and bed structuration as operating variables for one SBE. Bleaching earths were characterized before and after CO₂ treatment for their flowability, particle size distribution, total lipids and neutral lipids contents. The extracted oils were characterized for their lipids class profiles and fatty acids composition. Extraction by warm hexane in Soxhlet was carried out to critically appraise the CO₂ option.