

## Title (en)

METHOD FOR REFINING OF SOAPSTOCK BY ACIDULATION AND SOLVENT EXTRACTION

## Title (de)

VERFAHREN ZUR RAFFINATION VON SEIFENGRUNDSTOFF DURCH ANSÄUERUNG UND LÖSUNGSMITTELEXTRAKTION

## Title (fr)

PROCÉDÉ D'AFFINAGE DE PÂTE DE NEUTRALISATION PAR ACIDULATION ET EXTRACTION DE SOLVANT

## Publication

**EP 4036197 A1 20220803 (EN)**

## Application

**EP 22153446 A 20220126**

## Priority

EP 22153446 A 20220126

## Abstract (en)

The invention refers to the vegetable oil processing and energy sector, in particular the obtaining of raw material for the production of biodiesel from the oil refining process waste, called soapstock (SS), that is formed after the washing of the crude oil with an aqueous alkali solution. The invention is to be used for the industrial production of advanced biodiesel from the SS, which is generally considered a waste to be deposited and which cannot be used for the production of food. A high-yield high-quality acid oil, that can be used to produce modern biodiesel, is obtained via the developed two-stage process that includes the acidulation of the SS to pH 2-3 with subsequent high-temperature treatment in an ultrasound environment and the extraction of raw materials for the synthesis of advanced biodiesel from the resulting mixture using an ultrasound environment without prior separation of the aqueous phase.

## IPC 8 full level

**C11B 13/02** (2006.01); **C11C 1/08** (2006.01)

## CPC (source: EP)

**C11B 13/02** (2013.01); **C11C 1/025** (2013.01); **C11C 1/08** (2013.01); **C11C 1/103** (2013.01)

## Citation (applicant)

- US 3965085 A 19760622 - HOLMBOM BJARNE, et al
- EP 1809755 A1 20070725 - COGNIS IP MAN GMBH [DE]
- EP 1809755 B1 20090708 - COGNIS IP MAN GMBH [DE]
- US 2001049452 A1 20011206 - REANEY MARTIN J [US]
- MICHAEL J. HAAS: "Improving the economics of biodiesel production through the use of low value lipids as feedstocks: vegetable oil soapstock", FUEL PROCESSING TECHNOLOGY, vol. 86, 2005, pages 1087 - 1096
- M. M. OSTAFIN ET AL.: "Recovering of the long-chain fatty acids from soapstock", PRZEMYSŁ CHEMICZNY, 2018
- Z.M.WANG.J.S. LEEJ.Y. PARKZ.H.YUAN: "Novel biodiesel production from soybean soapstock", KOREAN J. CHEM. ENG., vol. 24, 2007, pages 1027 - 1030, Retrieved from the Internet <URL:https://doi.org/10.1007/s11814-007-0115-6>
- C. ECHIMR.VERHEW. DE GREYC. STEVENS: "Production of biodiesel from sidestream refining products", ENERGY ENVIRON. SCI., vol. 2, 2009, pages 1131 - 1141, Retrieved from the Internet <URL:https://doi.org/10.1039/B905925C>
- C. NAKYUNGJ.S. LEEJ. KWAKJ. LEEI.H. KIM: "Production of Biodiesel from Acid Oil via a Two-Step Enzymatic Transesterification", J. OLEO SCI., vol. 65, 2016, pages 913 - 921
- B. H. GOHH. C. ONGC. T. CHONGW. CHENK. Y. LEONGS. X. TANX. J. LEE: "Ultrasonic assisted oil extraction and biodiesel synthesis of Spent Coffee Ground", FUEL, vol. 261, 2020, pages 116121, Retrieved from the Internet <URL:https://doi.org/10.1016/i.fuel.2019.116121>
- Y.I. PROKOFEV. N. POYARKOVAA. R. BYKOVA. S. SHESTAKOVV. A. KUZNETSOVO.G. ANDROSOVA: "Influence of the isolation method of the soapstock fatty component on its characteristics", RES. AGR. ENG., vol. 61, 2015, pages 111 - 115
- H. NAWAZM. A. SHADN. REHMANH. ANDALEEBN. ULLAH: "Effect of solvent polarity on extraction yield and antioxidant properties of phytochemicals from bean (Phaseolus vulgaris) seeds. Braz", J. PHARM. SCI., vol. 56, 2020, Retrieved from the Internet <URL:https://doi.org/10.1590/s2175-97902019000417129>
- M. CRUZE. COSTAM. F. ALMEIDAM. DA CONCEICAO ALVIM-FERRAZJ. M. DIAS: "Recovery of by-products from the olive oil production and the vegetable oil refining for biodiesel production", DETRITUS, vol. 4, 2018
- I. EFTHYIOPOULOSP. HELLIERN. LADOMMATOSA. KAYB. MILLS-LAMPTEY: "Integrated strategies for water removal and lipid extraction from coffee industry residues", SUSTAINABLE ENERGY TECHNOLOGIES AND ASSESSMENTS, vol. 29, 2018, pages 26 - 35, Retrieved from the Internet <URL:https://doi.org/10.1016/i.seta.2018.06.016>
- A1 JUHAIMI FOZCAN MMGHAFOOR KBABIKER EEHUSAIN S: "Comparison of cold-pressing and soxhlet extraction systems for bioactive compounds, antioxidant properties, polyphenols, fatty acids and tocopherols in eight nut oils", J FOOD SCI TECHNOL, vol. 55, 2018, pages 3163 - 3173, XP036547849, DOI: 10.1007/s13197-018-3244-5

## Citation (search report)

- [A] CN 113717796 A 20211130 - UNIV NANJING FORESTRY
- [A] US 3428660 A 19690218 - MORREN JOHN E
- [A] US 2003186818 A1 20031002 - REANEY MARTIN J T [CA]
- [I] SHAO P ET AL: "Process optimisation for the production of biodiesel from rapeseed soapstock by a novel method of short path distillation", BIOSYSTEMS ENGINEERING, ELSEVIER, AMSTERDAM, NL, vol. 102, no. 3, 1 March 2009 (2009-03-01), pages 285 - 290, XP025952054, ISSN: 1537-5110, [retrieved on 20090106], DOI: 10.1016/J.BIOSYSTEMSENG.2008.11.014

## Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

## Designated extension state (EPC)

BA ME

## DOCDB simple family (publication)

**EP 4036197 A1 20220803**

## DOCDB simple family (application)

**EP 22153446 A 20220126**