VT PATENTES
BIOMASA PARA LA BIOECONOMÍA
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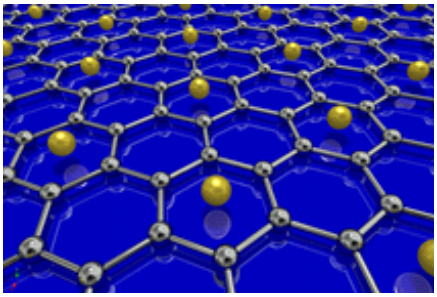
BOLETÍN BIOENERGÍA Y BIOPRODUCTOS

Grafeno a partir de biomasa



El grafeno, obtenido a partir de grafito, se aisló por primera vez en 2004 por los científicos rusos Andre Geim y Kostya Novoselov. Es el nanomaterial más revolucionario del siglo XXI y está considerado como el pilar básico de la nanoquímica del carbono. Su versatilidad deriva de su estructura en forma de láminas bidimensionales compuestas por átomos de carbono enlazados de manera hexagonal.

La importancia del grafeno radica en sus extraordinarias propiedades, permitiéndole su aplicación potencial en campos tan variados como el transporte, la biomedicina, la informática, la electrónica, la construcción, el sector energético (producción y almacenamiento de energía), etc. Entre sus características más destacadas cabe resaltar su elevada dureza, elasticidad, flexibilidad, transparencia y ligereza, además de su elevada conductividad, tanto térmica como eléctrica, así como su efecto antibacteriano y su selectiva permeabilidad.

Los procesos desarrollados en las dos últimas décadas para producir grafeno son muy numerosos, obteniéndose diferentes calidades de grafeno (grafeno altamente cristalino, grafeno poroso, etc.) y, por tanto, diferentes aplicabilidades, en función del proceso seleccionado. Al método de exfoliación micromecánica de grafito de Novoselov et al. en 2004, le siguieron la deposición química de vapor (CVD), el crecimiento epitaxial en carburo de silicio, la reducción química del óxido de grafeno e incluso la síntesis de grafeno poroso in situ a partir de madera por láser de CO2, entre otros. Sin embargo, todos ellos presentan determinados inconvenientes en términos de calidad y/o producción en masa, lo que dificulta su comercialización. Así, por ejemplo, la exfoliación micromecánica produce grafeno de alta calidad, pero no es un método adecuado de producción a gran escala; el crecimiento epitaxial permite sintetizar grafeno a escala de obleas, pero requiere un sustrato de carburo de silicio de elevado coste y temperaturas superiores a 1450 ºC; la reducción química del óxido de grafeno permite producir grafeno en masa, sin embargo, el uso de agentes químicos tóxicos y la complejidad de los procesos implicados impiden su escalabilidad, etc.

Con el fin de potenciar la innovación y la aplicación comercial del grafeno, en 2013 la Unión Europa creó el Graphene Flagship, una iniciativa todavía en vigor enmarcada en el programa de Future Emerging Technologies, con un presupuesto de 1 000 millones de euros y en la que participan más de 150 instituciones, entre centros de investigación y empresas, pertenecientes a 22 países.

Entre las estrategias utilizadas por los investigadores para reducir los costes de producción, se encuentra la utilización de biomasa (cáscara de arroz, madera, residuos agrícolas, etc.) como materia prima. Esto es posible debido a su abundancia, bajo coste y sostenibilidad. Hasta el momento, el biochar de cáscara de arroz es el precursor de biomasa más utilizado para producir grafeno, aunque los obtenidos a partir de serrín, glucosa o el quitosano también son el objeto de publicaciones recientes.

En la Tabla 1 se recogen varios ejemplos representativos de solicitudes de patente publicadas en diferentes países entre 2015 y 2021 referidas a la síntesis de grafeno a partir de biomasa. Se puede acceder a su contenido haciendo doble click sobre el número de publicación. Su análisis detallado permite dilucidar qué aplicaciones y procesos se encuentran más próximos a la comercialización y los precursores que se emplean para la producción de grafeno.

Tabla 1. Solicitudes de patente publicadas en la etapa 2015-2021

Nº Publicación	Título	Solicitante	País
CN113880078	Preparation method of biomass graphene	Aipu Food Ind Co Ltd	China
WO2021003565	Preparation of hydrous graphene oxide for use as a concrete admixture	Alter Biotica	Canada
US2019225497	Valorization of bio-oils	Alliance Sustainable Energy	EE.UU.
EP3730600	Biogas plant	Biela Pamies Javier	España
WO2017027908	Graphene synthesis	Commw Scient Ind Res Org	Australia
US2018126368	Process for the production of graphene sheets with tunable functionalities from seaweed promoted by deep eutectic solvents	Council Scient Ind Res	India
CN110898805	Preparation method and application of graphene-like structure biochar nano zero-valent iron-loaded composite material	Guangdong Inst Eco Environment & Soil Sciences	China
CN108298525	Graphene microcrystals and preparation method thereof	Guangxi Acad Sciences	China
CN109319764	Preparation method for synthetizing graphene through lignin combustion and application	Harbin Inst Technology	China
CN110129044	Graphene quantum dot preparation method taking biomass as carbon source and applications of graphene quantum dot	Harbin Inst Technology	China
CN114314794	Preparation method and application of graphene oxide based on high-salt spirulina residues	Harlittoral Industrial Univ	China
CN113896185	Preparation method and application of apricot shell-based nitrogen-doped graphene quantum dots	Hebei Normal Univ For Nationalities	China
CN112265983	Lignin graphene and preparation method thereof	Inst Chemical Ind Forest Products, CAF	China
EP3165507	Porous graphene preparation method	Jinan Shengquan Group Share-Holding Co Ltd	China
GB2601513	Graphene production method	Lig Nanowise Ltd	Reino Unido
CN108821267	Method for preparing graphene based on fungi	Lu Luhua	China
JP2021031328	Manufacturing system of graphene precursor, graphene precursor manufacturing method and graphene precursor	Okamoto Takaaki	Japón
KR20200078853	Laser-induced graphitization of cellulose nanofiber in ambient conditions	Postech Res & Business Dev Found	Corea del Sur
US2016215389	Compositions of matter and methods of producing a carbonized cloth for growth of graphene nano-petals	Purdue Research Foundation	EE.UU.
KR20210087367	Sanitary cover using biomass graphene	Remedylab Co Ltd	Corea del Sur
US2016060123	Producing graphene and nanoporous graphene	Res Institute Of Petroleum Industry	Irán
CN112251198	Preparation method of graphene PCM material	Shandong Tengchen Electric Appliance Co Ltd	China

Nº Publicación	Título	Solicitante	País
CN107342406	B and N co-doped three-dimensional graphene block and preparation method and application thereof	Shanghai Inst Ceramics, CAS	China
US2015133568	Method for preparing graphene from biomass-derived carbonaceous mesophase	Shanghai Switchdiy Digital Technology Co Ltd et al.	China
WO2020086841	Vacuum-free, hydrogen-free catalytic synthesis of graphene from solid hydrocarbons	The Univ of Tulsa	EE.UU.
US2017088428	Carbon nanosheets	Univ Alberta	Canadá
CN112723343	Method for directly preparing high-quality graphene from biomass	Univ Anhui Polytechnic	China
CN113548660	Method for preparing two-dimensional graphene-like carbon nanosheet by using nanocellulose	Univ Beihua	China
CN112607731	Device and method for preparing graphene powder	Univ Guangdong Technology	China
CN112707386	Preparation method and application of waste biomass derived graphene material	Univ Guilin Electronic Tech	China
EP3266743	Method for preparing biomass graphene by using cellulose as raw material	Univ Heilongjiang et al.	China
CN107142285	Method for producing biogas based on electrolytic coupling anaerobic fermentation of carbon electrode	Univ Jiangsu et al.	China
WO2020021361	Lignin based laser lithography process for fabricating 3d graphene electrode and method	Univ King Abdullah Sci & Tech	Arabia Saudí
US2015307356	Methods for synthesizing graphene from a lignin source	Univ Mississippi State et al.	EE.UU.
CN112875685	Graphene based on lignin in-situ generation and preparation method thereof	Univ Shaanxi Science & Tech	China
WO2021120800	Lignin-based graphene quantum dot, preparation method therefor and use thereof	Univ South China Tech	China
CN111517311	Preparation method of large-size biomass graphene and application of large-size biomass graphene in energy storage device	Univ Southwest Petroleum	China
CN113307254	Method for preparing three-dimensional porous graphene sheet by adopting low-temperature double-salt compound and application of three-dimensional porous graphene sheet	Univ Wuhan Science & Tech	China
CN110803695	Method for preparing graphene by taking large seaweeds as raw materials	Univ Zhejiang Technology	China
CN112142042	Preparation method of biomass graphene	Wuji Shiyi New Material Tech Co Ltd	China
CN110316714	Three-dimensional porous graphene structure carbon material based on rice husks, preparation method of material and application of material	Xian Jiaotong Univ Suzhou Academy	China
CN109749738	Sulfonated carbon quantum dots, preparation method thereof and application thereof serving as catalyst in preparing 5-hydroxymethyl furaldehyde	Zhejiang Tangneng Tech Co Ltd	China
CN111072014	Preparation method of graphene	Zhuhai Fudan Innovation Res Inst	China

Fuentes: Severo L. S. et al. Diamonds and Related Materials 117 (2021); Ikram R. et al. Journal of Materials research and Technology 9 (6) (2020)

PATENTES BIOENERGÍA

Biocombustibles sólidos (pellets, biochars, bio RDFs, bio SRFs, etc.)		
Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022232316 A1 20221103	Carbon Tech Holdings LLC (US)	**Biocarbon compositions with optimized fixed carbon and processes for producing the same.** In some variations, the invention provides a biocarbon composition comprising a low fixed carbon material with a fixed carbon concentration from 20 wt% to 55 wt%; a high fixed carbon material with a fixed carbon concentration from 50 wt% to 100 wt% (and higher than the fixed carbon concentration of the low fixed carbon material; from 0 to 30 wt% moisture; from 0 to 15 wt% ash; and from 0 to 20 wt% of one or more additives (such as a binder). Some variations provide a process for producing a biocarbon composition, the process comprising: pyrolyzing a first biomass-containing feedstock to generate a low fixed carbon material; separately pyrolyzing a second biomass-containing feedstock to generate a high fixed carbon material; blending the low fixed carbon material with the high fixed carbon material, thereby generating an intermediate material; optionally, blending one or more additives into the intermediate material; optionally, drying the intermediate material; and recovering a biocarbon composition containing the intermediate material or a thermally treated form thereof.
WO 2022248233 A1 20221201	Europeenne de Biomasse (FR)	**Stepwise method for continuously producing a combustible material by explosive decompression.** The invention relates to a method for continuously producing a combustible material from biomass, comprising: - continuously exposing the biomass introduced into a reactor to the water vapour at a pressure of between 15.3 and 22.9 bars for a sufficient amount of time to cause steam cracking; - continuously extracting, from the reactor, a portion of the biomass contained in the reactor. According to the invention, such a method comprises: - transferring the biomass extracted from the reactor in a conduit to separation means, wherein the vapour pressure is between 7 and 8 bars; - a step of separating a portion of the vapour extracted from the reactor to include the biomass and to exclude the biomass; - a step of reducing the pressure of the biomass separated from the vapour portion to atmospheric pressure.
EP 4074890 A1 20221019	Hydrofib (FR)	**Composition, plant matrix pellet and manufacturing method**. Process for manufacturing a pellet which comprises:- a sequence (A) of steps for forming a cellulosic matrix comprising unitary cellulose fibres, wood fibres, a water-soluble gelling agent and plant biomass pyrolysed, comprising at least:- a step of grinding paper,- a step of grinding wood fibers,- a step of mixing paper fibers and ground wood,- a step adding water-soluble gelling agent and pyrolyzed plant biomass, and- a step of mixing ground paper and wood fibers, gelling agent and pyrolyzed plant biomass; and- a step of composition of the pellet with this cellulosic matrix.
WO 2022254842 A1 20221208	Ihi Corp (JP)	**Solid fuel production apparatus, boiler system, and solid fuel production method.** A solid fuel production apparatus 110 is provided with a mixing unit 250 for mixing an additive A containing at least silica and a first biomass raw material R, and a granulation unit 260 for granulating a mixture N obtained by means of the mixing unit 250.
WO 2022223662 A1 20221027	N2AIR (FR)	**Method for regulating a pellet-fired burner and corresponding installation.** Method for regulating a wood burner that burns wood pellets, comprising the following steps: - for a batch of pellets, determining the air flowrate and fuel flowrate parameters according to the levels of combustion of the pellets in a defined pellet-fired burner, - creating at least one curve, - identifying the optimal air and fuel parameters, - recording these optimal parameters, the type of burner, the batch number, - possibly extrapolating to other pellet-fired burners, recording these extrapolated optimal parameters, - labelling each bag with information relating to these optimal parameters, - when using a bag of pellets in a domestic pellet-fired burner, reading the information using reading means, - regulating the domestic burner by acting on regulating means that regulate the supply of air and fuel to the burner.
WO 2022220246 A1 20221020	Revo Int Inc (JP)	**Organic feedstock decomposition method, and method for manufacturing liquid fuel, solid fuel, or activated carbon using same.** The present invention pertains to an organic feedstock decomposition method comprising: a feedstock supply step for supplying, to a fluidized bed decomposition device, artificial carbon particles and an organic feedstock containing biomass and/or organic polymer waste; and a decomposition step for, while introducing a carrier gas into the fluidized bed decomposition device and fluidizing the artificial carbon particles, decomposing the organic feedstock and discharging the result with the carrier gas as a non-solid-state decomposition component, whereas solid residue generated by said decomposition is discharged separate from the non-solid decomposition component.

Nº Publicación	Solicitante (País)	Contenido técnico
EP 4095218 A1 20221130	Subcoal Int BV (NL)	**Powdery Alternative Fuel.** The invention relates to a method to produce powdery alternative fuel by milling pellets, which pellets are produced by: (i) providing waste material comprising one or more thermoplastic material(s) of more than 40%, based on the total dry weight of the waste and one or more cellulosic material(s) of more than 30%, based on the total dry weight of the waste, wherein the waste has a particle size distribution with more than 80% larger than 5 mm and more than 95% smaller than 60 mm, having a water content of about 8 wt% or less; (ii) subjecting the waste material through a pelletiser with holes between 4-8 mm, and a length ratio of more than 10, such that the output temperature is about 85 °C or lower, (iii) subjecting the pellets through a second pelletiser with holes between 2 and 8 mm, and a length ratio of more than 14, such that the output temperature is about 110 °C or higher; (iv) to provide pellets, (v) and the pellets are cooled to a temperature of about 30 °C or lower. The powdery alternative fuel can be transported in bulk and through blowing lines.
EP 4095219 A1 20221130	TNO (NL)	**Hydrothermal treatment of biomass.** The present invention concerns an improved process for a process for the treatment of biomass, comprising (a) subjecting biomass to hydrothermal treatment in a hydrothermal reactor by immersing the biomass in a treatment liquid, wherein an effluent drained from step (b) or (c) is used as treatment liquid; (b) draining the liquid from the reactor via a liquid outlet to obtain a liquor and simultaneously or subsequently introducing another washing liquid into the reactor, wherein the washing liquid is pre-heated to a temperature 30 °C below operational temperature of step (a) or higher before being introduced into the reactor, (c) draining the reactor to obtain washed hydrothermally treated biomass and an effluent, wherein at least one of step (a) and (b) is performed at a temperature in the range of 100 - 250 °C. The invention further concerns a solid fuel and a liquor obtained by the process according to the invention, as well as a hydrothermal treatment facility to operate the process according to the invention.
WO 2022210558 A1 20221006	Toray Industries (JP) et al.	**Pellets and method for producing pellets.** The present invention provides: plant-based pellets that generate little dust, that reduce the amount of air pollutants from a boiler and improve the operational safety of a biomass boiler when used as a fuel, and that can be used to advantageously reduce management costs during transportation; and a method for producing the pellets. More specifically, the present invention provides pellets and a method for producing the pellets in which lignocellulosic biomass is used as a starting material and the average surface roughness of a side surface section of the pellets is 50-250 nm.
WO 2022223605 A1 20221027	Wurth Paul SA (LU)	**Method for providing raw material for an industrial process.** The present invention discloses a method for providing raw material for an industrial process, in particular for steel production. The method comprises the following steps: - torrefying a torrefaction material, which comprises biomass, in a reactor by thermochemically treating the torrefaction material at 200°C to 600°C, to obtain bio coal - extracting the bio coal from the reactor at a first temperature of up to 600°C, - providing bulk materials at a second temperature between 0°C and 100 °C, - mixing bio coal with bulk material, thereby cooling down the bio coal with the bulk material and obtaining a mixture of bulk material and bio coal at a third temperature, below the self-ignition temperature of the mixture, and - using the mixture to provide the raw material for the industrial process.

Syngas

Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022232936 A1 20221110	Enerkem Inc (CA)	**Optimizing carbon monoxide production from heterogeneous feedstock.** It is provided a process for increasing production of carbon monoxide (CO) and recycling carbon dioxide when treating synthesis gas using a carbon dioxide-to-carbon monoxide conversion unit, such as a Reverse Water Gas Shift (RWGS) reactor, converting excess CO2 from the produced syngas to additional CO, using an external source of green, renewable or low carbon intensity hydrogen.
EP 4086328 A1 20221109	Gidara Energy BV (NL)	**Method and apparatus for industrial production of renewable synthetic fuels.** The present invention provides a process and apparatus for converting feedstock comprising biomass and/or carbon-containing solid waste material to synthesis gas. The process comprises supplying a densified and pressurized feedstock to a gasifier comprising a fluidized bed zone and a post-gasification zone and contacting the feedstock with a gasification agent. Recovery and purification of the synthesis gas is then carried out involving the recycling of CO2 back to various stages in the process. The apparatus is configured to carry out the process and comprises transport lines to recycle the CO2. The synthesis gas can be further processed to form renewable synthetic products and/or chemicals.

Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022225407 A1 20221027	Hot Lime Labs Ltd (NZ)	**An improved updraft gasifier and methods of use.** An updraft gasifier including a reactor chamber, the chamber adapted to receive an amount of biomass fuel, one or more reaction gas input means, the base portion located below and fluidly connected to the receiving portion of the reactor chamber, a hollow feed tube extending into the receiving portion of the chamber to terminate at a feed tube terminus within the receiving portion of the chamber, one or more product gas output means located at or near the top of the receiving portion of the reactor chamber; and wherein the gasifier further includes a biomass distribution member within the receiving chamber, the biomass distribution member positioned to enable a portion of the distribution member to be moveable beneath the feed tube terminus.
EP 4098942 A1 20221207	Hustache Francois (FR)	**Method for processing organic waste by pyrolysis.** The present invention provides a process and apparatus for converting feedstock comprising biomass and/or carbon-containing solid waste material to synthesis gas. The process comprises supplying a densified and pressurized feedstock to a gasifier comprising a fluidized bed zone and a post-gasification zone and contacting the feedstock with a gasification agent. Recovery and purification of the synthesis gas is then carried out involving the recycling of CO2 back to various stages in the process. The apparatus is configured to carry out the process and comprises transport lines to recycle the CO2. The synthesis gas can be further processed to form renewable synthetic products and/or chemicals.
WO 2022229998 A1 20221103	Newpower Srl (IT)	**Modular system for the recovery and collection of polluted sludge from the seabed to be reclaimed with a simultaneous process for the generation of syngas and subsequent transformation into electricity for self-consumption of the system and extraction of hydrogen, nitrogen and heavy metals.** Modular system for the recovery and collection of polluted sludge from the seabed to be reclaimed with a simultaneous process for the generation of syngas and subsequent transformation into electricity for self-consumption of the system and extraction of hydrogen, nitrogen and heavy metals. This new system has been studied to carry out fast, efficient and effective remediation with significant savings being a modular sludge collection plant using a robotic system with a subsequent procedure for the generation of a synthesis gas, capable of accepting as input a solid organic material having variable size, format, content of humidity and calorific power value, in order to be able to manage the widest bulk and type of incoming materials at the lowest possible cost and with an environmental impact close to zero.
WO 2022208564 A1 20221006	Palazzetti Lelio SPA (IT)	**Heating apparatus.** Heating apparatus (10, 100, 200, 300), comprising both thermochemical decomposition means (M1) configured to receive a biomass (C) which functions as fuel and a first comburent (F1) and suitable to thermochemically decompose the biomass (C) and produce at least one combustible gas (S), and also a combustion chamber configured to receive a second comburent (A) and the at least one combustible gas (S) and suitable to develop heat by means of a flame fed by the at least one combustible gas (S) and which produces fumes (F).
WO 2022253366 A1 20221208	VS Banska Technicka Univerzita Ostrava (CZ)	**Method of enrichment of a gas produced by torrefaction and pyrolysis of biomass with methane and apparatus for implementing the method.** The object of the invention is a method of enrichment of a gas produced by torrefaction and pyrolysis of biomass with methane and an apparatus for implementing said method. According to the method, the biomass is first introduced into at least one torrefaction reactor, where it is subject to torrefaction at a temperature of 50 °C to 400 °C and a pressure of -50 kPa to +100 kPa, and then it is introduced into at least one pyrolysis reactor, where it is subject to pyrolysis at a temperature of 400 °C to 800 °C and a pressure of -50 kPa to +100 kPa to produce pyrolysis gas. During pyrolysis, a catalyst selected from the group consisting of nickel nanoparticles, copper nanoparticles, cobalt nanoparticles, platinum nanoparticles, palladium nanoparticles, ruthenium nanoparticles, rhodium nanoparticles, molybdenum nanoparticles, mercury nanoparticles and rhodamine 6G, or any combination thereof, is added to the biomass. Alternatively or in addition, before pyrolysis, preferably during torrefaction and/or after torrefaction outside the torrefaction reactor, a catalyst selected from the group consisting of cobalt nanoparticles, platinum nanoparticles, palladium nanoparticles, ruthenium nanoparticles, rhodium nanoparticles, molybdenum nanoparticles, mercury nanoparticles, rhodamine 6G, and a combination of nickel and cobalt nanoparticles, or any combination thereof, is added to the biomass. The addition results in a methane-enriched gas with a methane content of 10 to 60 vol. %. The present invention further relates to a use of said catalysts for enriching a gas produced by torrefaction and pyrolysis of biomass with methane, a computer program [product], a computer-readable medium and a data signal carrier.

Biogás

Nº Publicación	Solicitante (País)	Contenido técnico
EP 4101911 A1 20221214	Air Liquide (FR)	**Cryogenic purification for biogas with external pre-separation and solidification of carbon dioxide.** A combined plant for cryogenic separation and liquefaction of methane and carbon dioxide in a biogas stream, including a mixing means, a compressor, a first exchanger, a distillation column, a second exchanger, a separating means, an expanding means, and a separator vessel. Wherein, the mixing means is configured such that the recycle gas is the overhead vapour stream, and the first exchanger and the expanding means are combined.
EP 4105314 A1 20221221	Alvus SRL (IT)	**Digester with biomass extraction system.** Digester for biogas production comprising: a base associated with a supporting ground, a side wall extended between a lower portion associated with the base and an upper portion spaced from the lower portion along a height direction (X-X) perpendicular to the base, said side wall with the base defining a tank configured to receive inside it a quantity of biomass for generating biogas; a biomass extraction system configured to extract biomass from the tank, the extraction system comprising an extraction pipe configured to transport the biomass from inside the tank to outside it, pumping means associated with the extraction pipe and configured to extract the biomass from the tank via the extraction pipe; the extraction pipe extends between a first end portion arranged in proximity to the lower portion and a second end portion arranged in proximity to the upper portion along an inner surface of the side wall facing the inside of the tank.
WO 2022261790 A1 20221222	Anaergia Inc (CA)	**Hydrogen biomethane process and apparatus.** The specification describes systems and processes for producing methane gas from organic waste and ways to reduce GHG emissions from waste-to-energy facilities by biologically upgrading biogas. The system uses an anaerobic digester for receiving organic waste and producing a digester biogas, a biological upgrading reactor for receiving biogas from an anaerobic digester and increasing the methane content of the biogas; and a membrane system immersed in the upgrading reactor for diffusing an external source of hydrogen to the upgrading reactor to favor the conversion of carbon dioxide into methane by micro-organisms in the upgrading reactor. The specification also describes synergies between a hydrogen biomethanation (HBM) process and a supercritical CO2 power generation process (sCO2).
WO 2022223852 A1 20221027	Econward Tech SLU (ES)	**Production process for producing biogas by means of anaerobic co-digestion.** The invention relates to a production process for producing biogas by means of anaerobic co-digestion, comprising: (a) preparing hydrolyzed biomass from organic solid waste by means of a thermal hydrolysis treatment of waste at between 1.5 and 4.5 bar and between 120 and 160°C, generating raw biomass from which foreign matter is separated, giving rise to clean hydrolyzed biomass with at least 90 % organic matter, a volatile solids to total solids ratio of at least 0.6 and at least 5 % total solids; (b) mixing the clean hydrolyzed biomass with sludge from a wastewater treatment plant (WWTP), generating a mixture with a concentration of solids of less than 30 % which is conditioned to a concentration of less than 20 %; and (c) a step of wet anaerobic digestion in a digester at between 25°C and 40°C or between 50°C and 60°C and during an HRT of between 12 and 30 days, generating biogas and a digestate.
WO 2022238952 A1 20221117	Exe Engineering for Env SRL (IT)	**Landfill biogas extraction plant with remote management and control.** A remote control system of a plant (IMP) for managing the biogas catchment wells of a landfill (D) in an automated manner by means of central software, adapted to optimize biogas production by increasing its flow rate and maximizing the concentration of methane therein. The plant (IMP) has a plurality of extraction wells (PE), which are organized in substations (SSTAZ), and an infrastructure of controllers (PLC) for data acquisition and data sending. Each well (PE) is associated with an infrastructure of sensors (S, SQ, SG, SP), an adjustment valve (V), and an actuator (A). The sensors (S, SQ, SG, SP) are adapted to measure the volume percentage of methane %CH4, the volume percentage of oxygen %O2, the flow rate Q sucked in, and the applied negative pressure P of the well (PE). The extraction wells (PEs) of a substation (SSTAZ) are connected to a controller (PLC) of the infrastructure of data acquisition and data sending for sending the values measured from the sensors (S, SQ, SG, SP) to the remote control system through a communication network (NET). The remote management system receives the values measured from the sensors (S, SQ, SG, SP) through the controllers (PLC), processes them, and based on predetermined rules generates the actuation commands of the actuators (A) acting on the adjustment valves (V). The predetermined rules are based on a preference principle, according to which the well (PEx) to be opened more is chosen based on its contribution compared to the other wells (PEy), and on an interference principle, according to which, in the case of two interfering wells (PEi, PEi+1), the control system chooses the well from which to suck more biogas based on an average performance index (IQ) of the wells.

Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022220681 A1 20221020	Gashouders BV (NL)	**Compression of a biogas containing carbon dioxide, compressed biogas containing carbon dioxide, and use thereof.** The invention is directed to a process of preparing a compressed fuel, to a compressed fuel, and to the use of a compressed fuel comprising methane and carbon dioxide. The process of the invention comprises - providing a biogas; - removing one or more components from the biogas to obtain a purified biogas, wherein the purified biogas has a methane content of 30 mol% or more and a carbon dioxide content of 10 mol% or more, and - compressing the purified biogas to a pressure of 70 bara or more to form a compressed fuel.
WO 2022246546 A1 20221201	Iogen Corp (CA)	**Converting cellulosic biomass to fuel.** A process for converting cellulosic biomass to fuel includes loading bales of cellulosic biomass into an enclosure, at least partially filling the enclosure with an aqueous liquid, wherein the aqueous liquid is filled to a level selected to at least partially submerge the bales of cellulosic biomass once loaded into the enclosure, and subjecting the bales loaded within the enclosure to an anaerobic digestion to produce biogas. The biogas, which contains methane, is provided as a fuel, is upgraded to provide a fuel. The biogas or upgraded biogas can be used to produce a fuel, chemical, or product. A process for converting biomass to fuel includes subjecting cellulosic biomass to anaerobic digestion, and feeding at least a portion of the digestate to hydrothermal liquefaction to produce bio-oil.
WO 2022232011 A1 20221103	NCH Corp (US)	**System and method of increasing methane production in anaerobic digesters.** A spore germination composition and method to produce a bioaugmentation solution that is added to an anaerobic digester or partially aerobic digester to increase biogas production. A nutrient-germinant composition comprises L-amino acids a phosphate buffer, an industrial preservative, and an optional source of potassium. The composition and spores of one or more Bacillus species are heated to a preferred elevated temperature range of 35°C to 60°C for an incubation period of around 20 to 60 minutes to form a bioaugmentation solution that is dispensed to the digester, preferably to the hydrolysis stage of the digester. A dose of bioaugmentation solution is added to the digester around once per day in an amount to provide at least 1000 CFU per mL of the full volume capacity of the digester, which can increase methane production by around 5 to 10% over operation of the digester without the bioaugmentation solution.
EP 4070878 A1 20221012	Prodeval SAS (FR)	**Treatment of biogas purification streams.** Gas treatment method, said method comprising a step (E1) of purifying a flow of biogas coupled with at least one step (E2) of capturing carbon dioxide from a flow of gas, said flow of gas being able be the flow of biogas before purification (BS), the flow of biogas after purification (BM) or the flow of residual gas (GR1) resulting from purification.
WO 2022259064 A1 20221215	Zero3 SRL (IT)	**Improved biogas collection system.** System for collecting biogas generated from waste, said biogas collection system comprising a first collection duct and a second collection duct respectively extended along a first direction (A-A) and a second direction (B-B) parallel to each other, the first collection duct and the second collection duct being divided into a plurality of collection units each comprising a biogas inlet sleeve and a biogas feed duct; the inlet sleeves being aligned and mechanically connected to each other in series respectively along the first direction (A-A) and the second direction (B-B); a biogas collection manifold is fed through the feed ducts, each feed duct extending from the corresponding inlet sleeve to the collection manifold respectively, the collection manifold being parallel to the first (A- A) and second (B-B) direction and defining, with the first collection duct and the second collection duct, a collection structure, a first support plate and a second support plate arranged respectively on opposite sides of the collection manifold, the first collection conduit and the second collection conduit along the first (A-A) and the second direction (B-B), the first support plate and the second support plate being configured to support and stabilise the collection structure.

Bioalcoholes (bioetanol, biometanol, etc.)		
Nº Publicación	Solicitante (País)	Contenido técnico
CN 115161191 A 20221011	Chen Tingyong (CN)	**Cellulosic enzymolysis reaction device for producing cellulosic ethanol.** The invention discloses a cellulosic enzymatic hydrolysis reaction device for cellulosic ethanol production, and relates to the technical field of ethanol production, the cellulosic enzymatic hydrolysis reaction device comprises a cellulosic enzymatic hydrolysis reaction device body, the top of the cellulosic enzymatic hydrolysis reaction device body is fixedly connected with a mixing mechanism, and the right side of the cellulosic enzymatic hydrolysis reaction device body is fixedly connected with a circulating mechanism; the mixing mechanism comprises an outer frame device, a rotating device and a stirring device, and the bottom of the rotating device is fixedly connected with the bottom surface of the inner wall of the cellulosic enzymolysis reaction device body. A second motor is started to drive a center rod to rotate, a stirring rod and a fixing rod rotate along with the center rod, an elastic piece and a brush are driven to rotate at the same time, impurities attached to the inner wall of a rotating barrel are cleaned through the brush, meanwhile, the reaction is more sufficient, a reacted ethanol solution is pressed into a bottle body through vacuumizing to enter an ethanol collecting bottle, and the ethanol collecting effect is better. And the snake-shaped condensation pipe can condense the solution.
WO 2022240839 A1 20221117	Danisco US Inc (US)	**Increased ethanol production by over-expression of KGD2 in yeast.** Described are compositions and methods relating to modified yeast cells that over-express α-ketoglutarate dehydrogenase (K.GD2). Die modified yeast cells produce increased amounts of ethanol compared to otherwise identical parental yeast cells. Such yeast cells are particularly useful for large-scale ethanol production from starch substrates.
EP 4079718 A1 20221026	Janhunen Timo (FI)	**Process for the preparation of biomethanol.** A method of producing engine fuel, the base materials being biocarbon and the reactionsoccurring according to the formula wherein:1 in reaction 1 water vapour is introduced into glowing biocarbon ember, 2 in reaction 2 the gas mixture is directed through catalysts in a temperature of 400 C, 3 in reaction 3 biocarbon is combusted in oxygen-deficient conditions and4 biomethanol is formed in the reaction by means of catalysts. In reaction 3 carbon is combusted with oxygen (02) and the hydrogen formed in reactions 1 and 2 is used in reaction 4.
US 2022372449 A1 20221124	Nat Univ Simgapore (SG)	**Method of producing value-added chemicals by using clostridium and bacillus co-cultures.** The present invention relates to a composition or combination for the production of butanol and isopropanol, comprising an acetone-butanol-ethanol (ABE)-producing Clostridium strain and a genetically engineered B. subtilis strain, wherein said genetically engineered B. subtilis strain has been transformed by at least one polynucleotide molecule; the at least one polynucleotide molecule comprising a secondary alcohol dehydrogenase gene operably linked to at least one promoter. The invention also relates to methods of producing butanol and isopropanol in a co-culture, methods of producing butyrate, isopropanol and butanol in a co-culture and methods of producing esters.
WO 2022261162 A1 20221215	Novozymes AS (DK) et al.	**Controlling yeast blend ratios, and related control systems, apparatuses, and methods.** A method of producing bioethanol in a bioethanol system and a control system for a bioethanol system is disclosed, the control system comprising a controller comprising one or more processors and an interface, wherein the one or more processors are configured to obtain a grain flour flow of grain flour; determine an input scheme based on the grain flour flow; and control one or more input devices of the bioethanol system according to the input scheme. The one or more processors may further be configured to sense one or more indicators associated with a fermentation (e.g., bioethanol) system, to determine a yeast blend ratio based at least partially on the one or more indicators, generate one or more control signals based on the determined yeast blend, and convey the one or more control signals to the fermentation system. Associated systems, apparatuses, and methods are also disclosed.
WO 2022234597 A1 20221110	Praj Industries (IN)	**An enzymatic pre-treatment method for efficient saccharification of lignocellulosic materials.** The presently disclosed invention relates to an enzymatic pre-treatment method for efficient saccharification of lignocellulosic materials. The invention involves a process for releasing carbohydrates/sugars from processing the agricultural feedstock and pre-treating the processed feedstock with lignin modifying enzymes (LME) to produce the reaction mixture which is further used for releasing free carbohydrates/sugars. More particularly, it relates to the production of lignin modifying enzymes and efficient delignification of lignocellulosic materials by using lignin modifying enzymes to prepare ethanol or other bio-chemicals.

Nº Publicación	Solicitante (País)	Contenido técnico
NL 2032740 A 20220920	Univ Henan Agricultural (CN)	**Method for bioproduction of ethanol from tung tree leaves.** The invention relates to the preparation of ethanol, more particularly to a process for bioethanol from tung tree leaves, comprising the following steps: 1) Crush the tung tree leaves into powder form. with a 5 grinding machine; 2) Weigh a fixed amount of the tung tree leaf powder and pour it into an Erlenmeyer flask, then weigh a fixed amount of distilled water and pour it into the Erlenmeyer flask, and finally mix it evenly with the tung tree leaf powder; 10 3) Weigh cellulas accurately according to the ratio of cellulase and tung tree leaf powder 0.4:l, and add it to the Erlenmeyer flask; Then weigh a fixed amount of yeast and add it to the Erlenmeyer flask; and finally, shake well so that the cellulase and yeast are well mixed with the mixture.
WO 2022231184 A1 20221103	Univ Korea Res & Bus Found (KR)	**Novel protein having methane or butane oxidation activity.** The present invention relates to a protein having activity for producing methanol or butanol by oxidizing methane or butanol; a microorganism expressing same; a composition for producing methanol or butanol using same; and a method for producing methanol or butanol, wherein the protein is a self-assembled protein comprising a ferritin monomer fused with an ammonia oxidase active domain having methane oxidation activity, or a butane oxidase active domain having butane oxidation activity.
WO 2022216622 A1 20221013	Univ Leuven Kath et al. (BE)	**Yeast strain development for ethanol production.** Disclosed herein are yeast strains and derivatives thereof, as well as compositions comprising the yeast strains for use in ethanol manufacture. The disclosure also relates to processes for producing ethanol from biomass using the yeast strains and compositions. In particular, the yeast strains produce lower glycerol and higher ethanol, and have a higher temperature tolerance and higher fermentation rate than strains and products currently used in ethanol production processes.
NL 2030489 A 20221115	Univ Qilu Technology (CN)	**C6/C5 co-fermentation saccharomyces cerevisiae capable of relieving antagonism between high xylose utilization and high robustness and use thereof.** The present disclosure discloses a C6/C5 co-fermentation Saccharomyces cerevisiae capable of relieving antagonism between high xylose utilization and high robustness, and use thereof in fermentation to produce a second-generation fuel ethanol.

Biodiésel

Nº Publicación	Solicitante (País)	Contenido técnico
CN 115232675 A 20221025	Hubei Tianji New Energy Ltd By Share Ltd (CN)	**Method for producing biodiesel by re-esterifying waste oil through biological enzyme method.** The invention discloses a method for producing biodiesel by re-esterifying waste oil through a biological enzyme method. The method comprises the following steps: carrying out enzymolysis and esterification reaction through a two-stage biological enzyme method; carrying out two-stage acid catalysis re-esterification reaction; and carrying out neutralization deacidification reaction and post-treatment to obtain the biodiesel. A two-stage enzymatic reaction is adopted, a first-stage upper-layer product of the enzymatic reaction serves as a raw material to be added into a second-stage enzymatic reaction, and a first-stage lower-layer product serves as a raw material for pretreatment and returns to the pretreatment step; the reaction enzyme of the primary enzyme method adopts an enzyme-containing product after the reaction of the secondary enzyme method, which is beneficial to adjusting the balance of chemical reaction, promoting the forward proceeding of the reaction, generating crude methyl ester, improving the final biodiesel yield and reducing the addition of water for reaction; the residual sulfuric acid in the reaction product is extremely low, and the obtained biodiesel is high in quality and high in yield.
CN 115141685 A 20221004	Shijiazhuang Univ (CN)	**Novel method for preparing biodiesel through catalysis of amino acid ionic liquid.** The invention relates to a method for preparing biodiesel through catalysis of natural amino acid ionic liquid, which is characterized in that animal and vegetable oil is used as a raw material, the natural amino acid ionic liquid is used as a catalyst, and the biodiesel is prepared through transesterification. The preparation method has the following advantages: (1) the natural amino acid ionic liquid is simple in preparation process, relatively low in price, high in catalytic activity, mild in reaction condition and short in reaction time; and (2) the natural amino acid ionic liquid is stable in performance, reusable, simple in separation process, low in post-treatment cost, pollution-free, degradable, free of corrosion to equipment and environment-friendly, and is expected to become a clean process route with extremely high competitiveness. And (3) the biodiesel prepared by the method has few impurities and high purity, and the yield of the biodiesel can reach 92%.

Nº Publicación	Solicitante (País)	Contenido técnico
CN 115161120 A 20221011	Sichuan Jinshang Environmental Protection Tech Co Ltd (CN)	**System and method for producing biodiesel from waste animal and plant oil in large scale.** The invention discloses a system and a method for producing biodiesel from waste animal and plant oil on a large scale, and solves the technical problems of increase of biodiesel production cost and reduction of final profit caused by re-steaming removal of sulfur, phosphorus, chlorine and heavy metals in the prior art. The system mainly comprises a disc centrifuge, a hydrolysis tower, an enzymatic reaction system, a distillation tower and a vacuum buffer tank, wherein the vacuum buffer tank is connected with a biodiesel finished product output pipe provided with a first pump. The production method comprises the following steps: continuously washing the waste animal and vegetable oil by a disc centrifuge, feeding into a hydrolysis tower to hydrolyze fatty acid, feeding into an enzymatic reaction system to generate crude fatty acid methyl ester, and purifying the crude fatty acid methyl ester by a distillation tower to obtain a biodiesel finished product. After sulfur, phosphorus, chlorine and heavy metal are treated from the source, only one-time distillation is needed during distillation and concentration, the distillation investment can be effectively reduced, the production cost is saved, the utilization rate of raw materials is improved, and the profit rate of an enterprise can be increased by 40-50%.
WO 2022227122 A1 20221103	Tsinghua Innovation Ct Dongguan (CN)	**Method for preparing biodiesel by using dual mofs immobilized lipase.** Disclosed is a method for preparing biodiesel by using dual MOFs immobilized lipase, which comprises the following steps: preparing ZIF-8; preparing ANL/ZIF-8 by using ZIF-8; preparing a three-dimensional ordered polystyrene template; preparing M-ZIF-8 by using the three-dimensional ordered polystyrene template; preparing ANL@M-ZIF-8 by using M-ZIF-8; and mixing an oil, a short-chain alcohol, ANL/ZIF-8, and ANL@M-ZIF-8 for reaction, so as to obtain biodiesel. The present invention simultaneously uses ANL/ZIF-8 and ANL@M-ZIF-8 as dual MOFs so as to prepare biodiesel, which not only solves the problem in which the pore size of a single MOFs mesoporous structure is insufficient and inhibits the catalytic synthesis effect, but also integrates the physical and chemical properties of the mesoporous structures of two MOFs, to form a multi-layered porous adsorption structure, thereby greatly improving the yield of biodiesel.
WO 2022227123 A1 20221103	Tsinghua Innovation Ct Dongguan (CN)	**Technological method for co-production of L-ascorbic acid palmitate and biodiesel.** Disclosed in the present invention is a technological method for co-production of an L-ascorbic acid palmitate and biodiesel, comprising the following steps: performing primary enzyme-catalyzed reaction on an L-ascorbic acid and palm oil to obtain a primary enzyme-catalyzed mixture; performing layering and reduced pressure distillation treatment on the primary enzyme-catalyzed mixture to obtain a primary enzyme-catalyzed product; performing secondary enzyme-catalyzed reaction on the primary enzyme-catalyzed product to obtain a secondary enzyme-catalyzed mixture; and performing distillation treatment on the secondary enzyme-catalyzed mixture under an online dehydration condition to obtain L-ascorbic acid palmitate and biodiesel. In the present invention, the mutual dissolution of the L-ascorbic acid palmitate and the biodiesel is prompted due to the solubility of the L-ascorbic acid in a short-chain alcohol, and two-step enzyme-catalyzed reaction is adopted to perform reaction under a mild condition, so that the reaction of the L-ascorbic acid and the palm oil is catalyzed by a lipase to produce L-ascorbic acid palmitate, and the reaction of the palm oil and the short-chain alcohol is catalyzed to produce biodiesel, thus achieving the integrated co-production of multiple high value-added products.
CN 115222118 A 20221021	Univ Kumming Science & Tech (CN)	**Biodiesel induction period prediction method based on machine learning.** The invention discloses a biodiesel induction period prediction method based on machine learning, which comprises the following steps: firstly, measuring the composition and induction period of biodiesel, calculating five parameters representing the content and molecular structure, normalizing the five parameters, and taking the normalized five parameters as input values of a least square support vector machine model; meanwhile, two important parameters of the least square support vector machine model are optimized by adopting a particle swarm optimization algorithm, the operation speed and the model prediction accuracy can be improved, after training is completed, data in a training set and a test set are subjected to normalization processing and then input into the trained model to predict the biodiesel induction period, and the prediction accuracy of the biodiesel induction period is improved. The prediction performance of the model is judged by adopting four evaluation indexes, and the induction period of the biodiesel can be accurately and rapidly predicted from the aspects of the content of fatty acid methyl ester and the molecular structure; compared with other methods at the current stage, the method is more novel, smaller in error, wider in applicable biodiesel samples and higher in practical value.

Nº Publicación	Solicitante (País)	Contenido técnico
KR 20220157165 A 20221129	Univ Nat Chonnam Ind Found (KR)	**Method for preparing microorganism with improved lipid productivity into which fasciclin domain containing protein gene is introduced and method for manufacturing lipids using the same.** The present invention includes an isolated polynucleotide encoding a fasciclin domain containing protein gene derived from radiation seaweed (, I[attributes={}; value=[Pyropia yezoensis]],) It relates to Chlamydomonas reinhardtii (, I[attributes={}; value=[Chlamydomonas reinhardtii]],) with improved lipid productivity transformed with a recombinant vector and a lipid production method using the same, Midomonas Reinhard Tea is expected to be used for mass production of metabolites such as lipids and starch.
CN 115287105 A 20221104	- (CN)	**The invention discloses an environment-friendly mixed biodiesel in the technical field of environment-friendly mixed biodiesel and a preparation method thereof.** The environment-friendly mixed biodiesel contains basic biodiesel and performance-stabilizing combined additives, and the basic biodiesel is obtained from seed extraction. The performance-stabilizing combination additive includes the following components by weight: 5-20 parts of aluminum oxide magnetic nanoparticles, 1-10 parts of sorbitan oleate, 1-5 parts of dodecenyl succinic anhydride parts, 1-10 parts of alkyl nitrates, 3-8 parts of antioxidants. The present invention develops and utilizes the characteristics of high oil content and good oil quality of Samara oil tree, and realizes reducing the raw material cost of biodiesel while expanding the industrial development direction of fruit oil trees. The present invention achieves the technical effect of environmental protection and emission reduction by mixing aluminum oxide magnetic nanoparticles with sorbitan oleate and adding them into basic biodiesel to significantly improve the energy density of biodiesel, promoting the production and application of environmentally friendly biodiesel.
CN 115322838 A 20221111	- (CN)	**Method for preparing fatty acid methyl ester by utilizing waste oil and fat.** The invention discloses a method for preparing fatty acid methyl ester by utilizing waste oil and fat. The fatty acid produced by partial rancidity is contained in the waste oil and fat from the kitchen, and the fatty acid is extracted in a countercurrent extraction tower with methanol. The main component of the light liquid at the top of the tower is It is methanol, the extracted fatty acid and a small amount of oil are pressurized by a light liquid pump, and after the preheater heats up, they enter the fixed-bed esterification reactor for an esterification reaction. Then it enters the top of the bubble column esterification reactor. After the methanol vaporizes, it passes through the bubble column reactor countercurrently to carry out the secondary esterification reaction, and the generated water is taken out from the top of the column by methanol. Both the acid value of the output from the bubble column esterification reactor and the countercurrent extraction tower output are lower than 0.5 mgKOH/g, and then enter the transesterification reactor to be converted into fatty acid methyl ester through transesterification. The invention separates the fatty acid from the oil and carries out the esterification reaction catalyzed by the solid acid separately, reduces the emission of three wastes and improves the utilization efficiency of the reactor.
CN 115261146 A 20221101	- (CN)	**Method for preparing novel biodiesel by coupling lignin with animal/vegetable oil.** The invention proposes a method for preparing novel biodiesel by coupling lignin with animal/vegetable oil, uniformly mixing lignin-derived phenols, animal/vegetable oil and solvent, and catalytic reaction on the catalyst under high temperature and hydrogen atmosphere, and the obtained product That is biodiesel. The present invention provides a new strategy for producing a new type of biodiesel by combining lignin pyrolysis bio-oil and animal/vegetable oil with in-situ esterification through hydrodeoxygenation, efficiently utilizing the aromatic ring unit and methoxyl functional group of lignin, through The selective conversion of lignin and animal/vegetable oils enables the efficient production of biodiesel. Specifically, lignin-derived phenols can be efficiently converted into cyclic alcohols by hydrodeoxygenation, followed by in-situ esterification with fatty acids to produce fatty acid cyclohexyl esters, namely biodiesel; and, the phenols produced during demethoxylation Methanol can also be converted into fatty acid methyl esters, realizing the simultaneous value addition of aromatic ring units and methoxy functional groups in phenols.

Bio-jet fuels

Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022243212 A1 20221124	Axens (FR)	**Process for conversion of biological feedstocks to middle distillates with catalytic inhibitor removal.** The invention relates to an improved apparatus and methods for removing carbon dioxide during the hydroprocessing and/or hydrotreatment of biological feedstocks in the making of middle distillates. The improved apparatus and methods eliminates the need for multiple auxillary processes to support it including, for example, an amine regeneration unit, thus significantly decreasing not only the cost of constructing such a facility, but also the energy intensity and by extension the carbon footprint required to make the renewable fuel.
US 2022315508 A1 20221006	Exxonmobil Res & Eng Co (US)	**High yield jet fuel from mixed fatty acids.** Disclosed herein are processes and systems that utilize olefin cross metathesis of triglycerides to produce jet fuel such as hydrocarbons with carbons numbers from C9 to C16. Jet range hydrocarbons may include paraffins, naphthenes, and aromatics with carbon numbers from 9 to 16 (C9-C16), and isomers thereof. The process described herein is versatile and may be suitable for producing jet range hydrocarbons from many different grades and sources of triglycerides. Further, the process described herein may be selective to jet range hydrocarbons which may result in increased yield as compared to hydrocracking or other processes for producing jet range hydrocarbons from triglycerides.
US 2022333023 A1 20221020	Exxonmobil Res & Eng Co (US)	**Co-processing of renewable jet and diesel.** Systems and methods are provided for co-processing of renewable distillate fractions with mineral fractions to produce at least a jet (or kerosene) boiling range product and a diesel boiling range product. A combination of a jet boiling range product fraction and a diesel boiling range product fraction with unexpected properties can be formed by first blending i) a distillate boiling range feed fraction containing a renewable distillate component with ii) a mineral feed fraction (possibly corresponding to a whole or partial crude oil) that includes diesel boiling range compounds to form a blended composition. The blended composition can then be fractionated to form a jet boiling range product fraction and a diesel boiling range product fraction. Optionally, the resulting jet boiling range product fraction and/or diesel boiling range product fraction can be exposed to further processing, such as hydroprocessing or catalytic cracking.
WO 2022256443 A1 20221208	Reg Synthetic Fuels LLC (US)	**Process for biorenewable light paraffinic kerosene and sustainable aviation fuel.** The present disclosure relates to biofuels, and more particularly, to biomass-based kerosene and aviation turbine fuels. In an aspect, a method is disclosed for producing a light paraffinic kerosene (LPK) where the method includes hydrotreating a biorenewable feedstock to yield a heavy hydrotreater fraction comprising C14-C24 n-paraffins; hydroisomerizing and hydrocracking the heavy hydrotreater fraction with a hydroisomerization catalyst under conditions yielding a hydroisomerizer product that includes a heavy hydroisomerizer fraction and the LPK; and separating the LPK from the hydroisomerizer product. The LPK provided by the method has an existent gum value of 7 mg/100 mL or less as measured according to IP 540 air evaporation method and further includes (a) a weight ratio of isoparaffins to n- paraffins of about 2: 1 or greater, or (b) no detectable hydrocarbons with 14 or more carbon atoms as measured by gas chromatography, or (c) a weight ratio of isoparaffins to n-paraffins of about 2: 1 or greater and no detectable hydrocarbons with 14 or more carbon atoms as measured by gas chromatography.
CN 115232644 A 20221025	Univ Beihang (CN)	**Method for co-refining aviation oil from bio-oil and heavy oil.** The invention discloses a method for preparing aviation oil by co-refining bio-oil and heavy oil, and belongs to the technical field of oil refining. The method comprises the following steps: mixing biological hydrogenated oil with heavy oil hydrogenated oil, sequentially carrying out hydrocracking through a three-layer catalyst bed, and then carrying out distillation separation to obtain aviation oil, naphtha and diesel oil, wherein a catalyst of the first catalyst bed layer is a hydroisomerization catalyst; the catalyst of the second catalyst bed layer is a hydrocracking catalyst; the catalyst of the third catalyst bed layer is a hydrofining catalyst; the biological hydrogenated oil is prepared through hydrofining by taking biological oil as a raw material, and the heavy oil hydrogenated oil is prepared through hydrofining by taking heavy oil as a raw material. According to the method disclosed by the invention, co-refining of the aviation oil is realized by deoxidizing the bio-oil and blending the bio-oil with the existing heavy oil under the condition that the blending ratio of the bio-oil is 50%, co-refining is carried out by adopting the method disclosed by the invention, the service life and the efficiency of the catalyst are not influenced, the product quality can be improved, the hydrogen consumption is reduced, and the bio-oil content in the aviation oil product is close to the blending ratio.

Biohidrógeno		
Nº Publicación	Solicitante (País)	Contenido técnico
CN 115141853 A 20221004	Fudan Univ (CN)	**Hydrogen production method and device.** The invention relates to a hydrogen production method and device. The hydrogen production method comprises the following steps: adding an algae substance into a reactor isolated from an external light source; adding a sodium sulfite solution with a concentration lower than a target concentration to the reactor; and providing pulsed illumination to the algal substance treated by the sodium sulfite solution for the interval photosynthesis of the algal substance. By executing the steps, the hydrogen production method can improve the hydrogen production efficiency of the algae substance, prolong the hydrogen production time of the algae substance and reduce the production cost of biological hydrogen production, thereby promoting the biological hydrogen production technology to be put into large-scale industrial production.
CN 115155618 A 20221011	Guangdong Univ of Technology (CN)	**Preparation method and application of ZnIn2S4 photocatalyst rich in Zn vacancy.** The invention relates to a preparation method of a ZnIn2S4 photocatalyst rich in Zn vacancies and application of the ZnIn2S4 photocatalyst in hydrogen production by photo-reforming lignin. A large number of researches find that ZnIn2S4 rich in Zn vacancies can be obtained by adjusting the molar ratio of the zinc source to the indium source to the sulfur source to be 1: 2: 2, and compared with an existing reactive ion etching technology or an ultrasonic stripping strategy, the method has the advantages that energy consumption is lower, and the Zn vacancy concentration is easy to adjust; and Zn vacancy can effectively improve the conductivity of ZnIn2S4, promote the separation of photon-generated carriers, and provide more active reaction sites at the same time. Through Pt modification, Pt can be uniformly dispersed on the surface of the catalyst to obtain the photocatalyst rich in zinc vacancies, on one hand, the photocatalyst can form a stable coordination structure with the generated vacancies so as to stabilize the generated Zn vacancy defect structure, and on the other hand, a Schottky barrier can be formed by constructing a Zn vacancy and Pt Schottky heterojunction so as to stabilize the Zn vacancy defect structure. The separation and transfer of photon-generated carriers are effectively promoted, the compounding of the carriers and holes is prevented by utilizing a potential barrier, and the catalyst is endowed with stronger photocatalytic capability.
CN 115212916 A 20221021	Inst of Environment and Sustainable Development in Agriculture Chinese Academy of Agricultural Scien (CN)	**Method for producing hydrogen through in-situ catalytic pyrolysis of agricultural wastes such as straws.** The invention belongs to the technical field of molecular sieve modification, and provides a modified HZSM-5 molecular sieve, a preparation method thereof and an in-situ catalytic pyrolysis method of agricultural wastes. The specific surface area of the molecular sieve is increased through first roasting, and the mass transfer and diffusion effects of the modified HZSM-5 molecular sieve are improved; meanwhile, moisture and impurities can be removed through first roasting, the moisture and the impurities are prevented from reacting with the agricultural and forestry waste in the pyrolysis process, and the pyrolysis conversion rate is increased. The HZSM-5 molecular sieve is fully impregnated and roasted by the Fe (NO3) 3 solution through vibration impregnation, so that the impregnation efficiency is improved, the firmness degree of iron ion loading can be enhanced, the stability of the modified molecular sieve is improved, the mass transfer and diffusion effects are further ensured, and the catalytic performance is improved. Ferric ions in the impregnated HZSM-5 molecular sieve can be converted into iron oxide through second roasting, and the loading stability of the iron element is improved.
CN 115231782 A 20221025	Nantong Hongjian Water Treat Equipment Co Ltd (CN)	**High-salt organic wastewater coupling desalination hydrogen production system.** The invention relates to a high-salt organic wastewater coupling desalination hydrogen production system which comprises a pretreatment system, a biological adsorption tank, a coupling desalination hydrogen production device and a hydrolysis acidification tank which are arranged in sequence, the coupling desalination hydrogen production device comprises a hydrogen production cathode, a peripheral cathode, an anode, a hydrogen production chamber, a cation exchange membrane, an anion exchange membrane, an anion chamber, a to-be-treated water channel, an electrooxidation chamber, a sodium ion exchange membrane and a cation chamber, and the hydrogen production chamber is arranged between the hydrogen production cathode and the cation exchange membrane; an electrooxidation chamber is arranged between the anode and the cation exchange membrane, an anion chamber is arranged between the anode and the anion exchange membrane, and cation chambers are arranged between the anion exchange membrane and the sodium ion exchange membrane and between the sodium ion exchange membrane and the peripheral cathode.

Nº Publicación	Solicitante (País)	Contenido técnico
CN 115141852 A 20221004	Qilu Univ of Technology et al. (CN)	**Application of calcium ferrite in production of H2 through dark fermentation and preparation method of calcium ferrite.** The invention provides a preparation method of calcium ferrite and application of the calcium ferrite in production of H2 through dark fermentation, CaFe2O4 particles are added into a dark fermentation reaction system, fermentation is carried out at 35-37 DEG C, and H2 is collected. The CaFe2O4 particles are applied to the process of producing H2 through dark fermentation for the first time, the CaFe2O4 particles have good biocompatibility, and the CaFe2O4 particles can selectively improve the microbial activity, promote the growth of H2-producing bacteria, optimize the microbial community structure of the fermentation system and increase the yield of H2 in the dark fermentation system. The CaFe2O4 particles can slowly release a small amount of calcium and iron ions in water, so that the defects of low bioavailability of trace elements, inhibition of metabolites, low microbial activity and the like in the fermentation process can be overcome.
CN 115215386 A 20221021	Qilu Univ of Technology (CN)	**Method for preparing nickel cobaltate nanoparticles and promoting dark fermentation hydrogen production.** The invention provides a preparation method of nickel cobaltate nanoparticles (NiCo2O4NPs) and application of the nickel cobaltate nanoparticles in the process of producing hydrogen (H2) through medium-temperature dark fermentation. A proper amount of NiCo2O4NPs (the dosage range is 50-400mg/L) is added, so that the microbial community structure of a fermentation system can be optimized, the abundance of H2 producing bacteria is improved, and a butyric acid type fermentation way is enhanced (a gene prediction result proves the abundance), so that the H2 yield of dark fermentation is remarkably increased. The method provided by the invention provides a theoretical basis for the resource application of the glucose wastewater by taking the simulated glucose wastewater as a substrate.
CN 115109606 A 20220927	Shandong Hongsenlin New Material Tech Co Ltd (CN)	**Coupling system for preparing pure hydrogen from biomass waste and poly-generation.** The invention discloses a coupling system for preparing pure hydrogen from biomass waste and poly-generation, which is characterized in that dry-basis biomass powder is added at the inlet end of a pre-cracking gasification mechanism, the smoke outlet of the pre-cracking gasification mechanism is communicated with the inlet end of a sub-temperature heat exchanger, the first outlet end of the sub-temperature heat exchanger is communicated with a smoke exhaust mechanism, and the second outlet end of the sub-temperature heat exchanger is communicated with the smoke exhaust mechanism; the outlet end of the pre-cracking gasification mechanism is communicated with the inlet end of the carbonization hydrogen production mechanism, a smoke outlet of the carbonization hydrogen production mechanism is communicated with the inlet end of the high-temperature-resistant cyclone dust collector, and the outlet end of the high-temperature-resistant cyclone dust collector is communicated with the inlet end of the heat exchanger through the high-temperature heat exchanger. The outlet end of the heat exchanger is communicated with the inlet end of the washing tower through the induced draft fan. According to the method, hydrogen-rich high-purity non-hydrogen biogas is obtained through pre-cracking of the flame-proof rotary kiln, thermal cracking of the suspended fluidized bed furnace, deep carbonization and carbon quenching treatment, and pure hydrogen energy with the highest purity of 99.99% and the high-purity non-hydrogen biogas are obtained through pressure swing adsorption separation treatment of the adsorption tower.
CN 115181777 A 20221014	South China Univ of Technology (CN)	**Method for enhancing bagasse resource utilization based on anaerobacter thermosaccharolyticus and charcoal and application.** The invention discloses a method for enhancing bagasse resource utilization based on anaerobacter thermosaccharolyticus and biochar and application of the bagasse resource utilization based on anaerobacter thermosaccharolyticus and biochar. The method comprises the following steps: enriching anaerobic cellulose degrading flora by taking a cellulose substance as a carbon source; preparing a thermophilic anaerobacter saccharum seed solution; the method comprises the following steps: inoculating a fermentation hydrogen production culture medium with a cellulose degrading flora and a thermolytic anaerobacter sacchari seed solution, carrying out dark fermentation hydrogen production, and collecting a waste liquid after fermentation hydrogen production; the waste liquid is used as a solvent to prepare a fermentation methanogenesis culture medium, anaerobic sludge rich in methanogenesis flora is inoculated, and fermentation methanogenesis is carried out. According to the method, common waste biomass bagasse is taken as a substrate, a simple and effective two-phase anaerobic fermentation process is adopted, hydrogen production and methane production processes are regulated and controlled in stages, and the final total energy recovery reaches 15.84 MJ/kg of substrate. The method provided by the invention is particularly suitable for producing biofuel by microbial conversion of bagasse.

Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022264182 A1 20221222	Ventriglia Fausto Maria (IT)	**Integrated process for the sustainable and autonomous CO2-emission-free production of hydrogen and related system.** The present invention concerns an integrated process for producing hydrogen comprising the following steps: a) production of algal biomass by means of a photobioreactor (1) wherein microalgae are fed with water and carbon dioxide and irradiated with light radiation; b) anaerobic digestion for obtaining biomethane and nitrogen digestates by means of an anaerobic digester (2), wherein said anaerobic digestion takes place starting from said algal biomass obtained in said step a); c) steam reforming for obtaining hydrogen, carbon dioxide and heat starting from steam, oxygen and said biomethane obtained in said step b), and subsequent separation of carbon dioxide; and d) alkaline electrolysis of water for obtaining hydrogen and oxygen, by means of electrolysers (4), starting from water heated by the heat obtained in step c) and electric power, wherein the carbon dioxide in said step a) comes from step c) and the oxygen in said step c) comes from step d).
CN 115140708 A 20221004	Yangzhou Zhongqing Renewable Resources Tech Co Ltd (CN)	**Continuous green hydrogen production system and method based on biomass pyrolysis.** The invention discloses a continuous green hydrogen production system and method based on biomass pyrolysis, belongs to the field of biomass pyrolysis, and is used for solving the problems that in the hydrogen production process, biological residues cannot be rapidly replaced, a large amount of time is wasted, and the hydrogen production efficiency is influenced. Comprising a biological reaction module, a primary pyrolysis module, a secondary pyrolysis module, a gas reaction module and a hydrogen collection module, the biological reaction module carries out air isolation on renewable hydrogen production organisms in the biological reaction module, and the primary heating module heats biological hydrogen production in the biological reaction module; the method comprises the following steps: a biological reaction module is used for carrying out biological reaction on biological residues, generated gaseous substances enter the gas reaction module for secondary heating, gas generated by secondary heating reacts in the gas reaction module to generate hydrogen, and the hydrogen collection module is used for collecting the generated hydrogen. And organisms after internal reaction can be conveniently replaced, so that the hydrogen production efficiency of the organisms is improved.

Otros biocombustibles (hidrobiodiesel, etc.)

Nº Publicación	Solicitante (País)	Contenido técnico
US 2022315846 A1 20221006	Duke Tech LLC (US)	**Method for treating renewable feedstocks.** A non-petroleum or renewable feedstock containing oxygen and contaminants of metals, gums, and resins is treated by introducing the feedstock into a reactor at a flow velocity of at least 20 ft/sec. The feedstock is heated within the reactor and cooled to form a reduced-temperature reactor product. At least a portion of the reduced-temperature reactor product is feed into a hydroprocessing reactor containing a hydroprocessing catalyst to form a hydroprocessed product. The hydroprocessed product is cooled and non-condensable gases, metals and water are separated and removed to form a final product. The final product has an oxygen content that is 60% or less of that of the feedstock, and wherein the final product comprises 25 wt % or less any triglycerides, monoglycerides, diglycerides, free fatty acids, phosphatides, sterols, tocopherols, tocotrienols, or fatty alcohols, from 5 wt % to 30 wt % naphtha, and 50 wt % or more diesel.
WO 2022236422 A1 20221117	Expander Energy Inc et al. (CA)	**Process for producing synthetic hydrocarbons from biomass.** A process for preparing synthetic hydrocarbons from a biomass feedstock is provided. The process involves electrolysis of steam and/or CO2, optionally along with a refinery gas in a high temperature co-electrolyzer (HTCE) to produce oxygen and hydrogen and/or enhanced hydrogen rich syngas. The oxygen generated via the electrolysis process is used for partial oxidation of a biomass feedstock in a gasifier to generate a hydrogen lean syngas. The hydrogen lean syngas is mixed with at least a portion of the hydrogen and/or enhanced hydrogen rich syngas generated via the high temperature electrolysis/co-electrolysis to formulate a hydrogen rich syngas. The hydrogen rich syngas is then reacted in a Fischer Tropsch (FT) reactor to produce synthetic hydrocarbons and refinery gas.
US 2022403251 A1 20221222	Exxonmobil Technology & Engineering Company (US)	**Upgrading bio-waste in FCC.** A method may include: providing bio waste stream wherein the bio waste stream comprises at least one bio waste selected from the group consisting of palm oil mill effluent, soapstock, and combinations thereof; introducing the bio waste effluent stream into a fluidized catalytic cracking unit; contacting the bio waste with a catalyst in the fluidized catalytic cacking unit; and cracking at least a portion of the bio waste stream to form cracked products that comprise a cracked product stream.

Nº Publicación	Solicitante (País)	Contenido técnico
SE 2250087 A1 20221109	PREEM AB (SE)	**Catalytic cracking of tall oil pitch-origin feedstock. A process for producing a fuel component.** The process comprises providing a petroleum derived feedstock comprising vacuum gas oil (VGO) and/or unconverted oil (UCO) and providing a tall oil pitch-origin (TOP-origin) feedstock comprising fatty acids and resin acids, and/or derivatives thereof. The TOP-origin feedstock has a boiling point distribution in which at least 40 wt% of the TOP-origin feedstock has a boiling point in the range of 100-500 °C. The process further comprises combining the petroleum derived feedstock with the TOP-origin feedstock to provide a combined feedstock, catalytically cracking the combined feedstock in a catalytic cracking unit to provide a cracking product. A cracking product. Use of a tall oil pitch-origin (TOP-origin) feedstock. Use of a fluid catalytic cracking unit.
CN 115125025 A 20220930	Univ Qingdao Science & Tech (CN)	**Biofuel and preparation method thereof.** The invention discloses biological fuel oil and a preparation method thereof.The biological fuel oil comprises 60-80 wt% of a component A and 20-40 wt% of a component B. The component A comprises, by weight, 50-70 parts of blue algae extract oil, 1-5 parts of a surfactant and 1-10 parts of water; and the component B comprises the following components in parts by weight: 10-28 parts of diesel oil, 2-10 parts of oleic acid, 2-10 parts of ethanol, 1-8 parts of a modifier and 0.1-2 parts of an anti-explosion agent. The biological fuel oil can replace diesel oil and is energy-saving and environment-friendly, the preparation method is simple, the cost is relatively low, and engineering industrialization is easy to realize.
CN 115181583 A 20221014	Zhejiang Univ (CN)	**Method and system for preparing liquid fuel by coupling biomass catalytic pyrolysis and online upgrading.** The invention provides a method and a system for preparing liquid fuel by coupling biomass catalytic pyrolysis and online upgrading. The method and the system can be used for preparing liquid fuel with higher quality from biomass. On one hand, the invention provides a method for preparing liquid fuel by coupling biomass catalytic pyrolysis and online upgrading, which comprises the following steps: a catalytic pyrolysis step: performing catalytic pyrolysis on a mixed raw material of biomass and a clay catalyst to obtain biomass pyrolysis gas; an online upgrading step: mixing the modified solid acid catalyst with the biomass pyrolysis gas to react, and obtaining hydrocarbon liquid fuel after the reaction; on the other hand, the invention also provides a system for preparing liquid fuel by coupling biomass catalytic pyrolysis and online upgrading, and the system comprises a catalytic pyrolysis unit used for performing catalytic pyrolysis on a mixture containing biomass and a clay catalyst; and the on-line upgrading unit is connected with the catalytic pyrolysis unit and is used for carrying out on-line upgrading on the biomass pyrolysis gas generated by the catalytic pyrolysis unit.
CN 115322815 A 20221111	- (CN)	**A bio-based methanol gasoline and a preparation method thereof, and relates to the technical field of methanol gasoline.** The invention discloses a bio-based methanol gasoline and a preparation method thereof, and relates to the technical field of methanol gasoline. In the preparation of the bio-based methanol gasoline, the present invention pre-processes the leaves to obtain biomass powder, inoculates and ferments the biomass powder to obtain bio-oil, and performs catalytic hydrogenation on the bio-oil to obtain saturated bio-oil , mixing methanol, saturated bio-oil and gasoline to prepare bio-based methanol gasoline. The bio-based methanol gasoline prepared by the invention has excellent low pollution
CN 115386403 A 20221125	- (CN)	**A fuel, which comprises the following components: Wax, tallow and lard, fatty acid methyl ester, hydrogenated oil, stearic acid, salt, sugar, ferrocene.** The invention discloses a fuel, which comprises the following components: wax, tallow and lard, fatty acid methyl ester, hydrogenated oil, stearic acid, salt, sugar, ferrocene; the weight percentage of each component is: wax 40 ~80 parts, 10~30 parts of lard and tallow, 10~30 parts of fatty acid methyl ester, 5~20 parts of hydrogenated oil, 2.5~10 parts of stearic acid, 0.5~1 part of salt, 10 parts of sugar, 0.5 parts of ferrocene ~1 part; the mass ratio of the lard and tallow is 1:1, and the wax is one or more of beeswax, paraffin, and Fischer-Tropsch wax. The fuel is weighed, water-bathed, stirred, cast, put The pyrotechnic body is prepared by sealing and sealing, the preparation process is simple, and the cost is low. The high-efficiency combustion device of the fuel includes a metal box body, and a metal cylinder body is arranged concentrically and coaxially in the center of the metal box body. The invention is convenient to carry, quick to start a fire, and has good heating effect.
CN 115414939 A 20221202	- (CN)	**A method for synthesizing an ultra-high-loaded Ni-Fe/ZrO2 catalyst used for hydrogenation of fats and oils to prepare second-generation biodiesel.** The invention discloses a method for synthesizing an ultra-high-loaded Ni-Fe/ZrO2 catalyst used for hydrogenation of fats and oils to prepare second-generation biodiesel, comprising the following steps: firstly, zirconium nitrate, nickel nitrate, iron nitrate and deionized Water is evenly mixed in a certain proportion, which is recorded as solution A.

PATENTES BIOPRODUCTOS

Biomateriales (de construcción, medicina, embalaje, etc.)		
Biocomposites y biofibras		
Nº Publicación	**Solicitante (País)**	**Contenido técnico**
WO 2022258505 A1 20221215	Basf SE (DE)	**Process of producing a lignocellulosic composite, corresponding lignocellulosic composite, and use thereof.** Described is a process of producing a multilayer lignocellulosic composite comprising one or more lignocellulosic composite layers or a single-layer lignocellulosic composite, wherein a high-frequency electrical field is applied and wherein a binder comprising for hardening the binder via esterification at least one, two or more compounds having two or more hydroxy groups and additionally one, two or more compounds having two or more carboxyl groups is provided or prepared. Furthermore described is a lignocellulosic composite, which is preparable according to that process, a construction product comprising such lignocellulosic composite, the use of such lignocellulosic composite as a building element in a construction product and a binder or binder composition for producing a lignocellulosic composite.
EP 4089149 A1 20221116	ETH Zuerich (CH)	**Bioplastics based on amyloid fibrils and biodegradable polymers.** The present invention relates to novel composite materials comprising amyloid fibrils and a biodegradable polymer. The invention further provides for environmentally friendly methods to manufacture such composite materials, to articles comprising such composite materials and the use of such composite materials. The composite materials described herein show unexpected beneficial properties, when compared to the individual constituents. These beneficial properties include improved mechanical properties (e.g. flexibility), improved biodegradation, improved antioxidant properties, and beneficial optical properties (high transparency in the visible, combined with UV-blocking).
EP 4071216 A1 20221012	Evertree (FR)	**Process for the manufacture of a lignocellulosic fibre-based composite material using formulated plant seed pellets and composite material obtained by such process.** The present invention relates to a process for the manufacture of a lignocellulosic fibre-based composite material comprising the steps of: obtaining a fibrous mix (S1) comprising a defibrated lignocellulosic material and defibrated formulated plant seed pellets; blending the fibrous mix with a resin (S2) to form a composite mixture; and curing (S3) the composite mixture, thereby forming the lignocellulosic fibre-based composite material. A preferred application of this process is the manufacture of fibreboards, such as MDF.
WO 2022264944 A1 20221222	Kaneka Corp (JP)	**Biodegradable laminate and method for manufacturing same.** This biodegradable laminate includes: a substrate layer; a first thermoplastic resin (A1) layer including a polyhydroxyalkanoate-based resin, the first thermoplastic resin (A1) layer being laminated on one surface of the substrate layer; and a second thermoplastic resin (A2) layer including a polyhydroxyalkanoate-based resin, the second thermoplastic resin (A2) layer being laminated on the other surface of the substrate layer. The weight of the first thermoplastic resin (A1) layer is 10 g/m2 or greater and 200 g/m2 or less, and the weight of the second thermoplastic resin (A2) layer is 0.1 g/m2 or greater and 5 g/m2 or less.
WO 2022254370 A1 20221208	Kings Flair Dev Ltd (CN)	**Composite plastic comprising plant fiber, and preparation method therefor and use thereof.** A preparation method for a composite plastic comprising a plant fiber, comprising: providing a first raw material containing a plant fiber and a second raw material containing a plastic; pre-treating the first raw material; heating the pretreated first raw material for carbonization treatment; and mixing the carbonized first raw material and the second raw material to form a composite material. Coffee grounds can be used as the first raw material, and the pretreatment of the coffee grounds comprises: washing the first raw material with water to remove a pollutant and a water-soluble compound; drying the washed first raw material; extracting an oily substance from the dried first raw material by using a solvent extraction method, so as to obtain the first raw material after the oily substance is extracted; and completely removing a solvent from the extracted first raw material. The prepared composite plastic containing the coffee grounds has improved mechanical properties, tensile properties, and thermal stability, and obtains wider application.
WO 2022255615 A1 20221208	Korea Res Inst Chemical Tech (KR)	**Biodegradable furan-based composite having improved mechanical properties, and method for producing same.** The present disclosure relates to: a furan-based biodegradable composite produced by polymerizing a furan-based dicarboxylic acid or derivative thereof, an aliphatic dicarboxylic acid or derivative thereof, an aliphatic diol, and a natural polymer nanofiber; and a method for producing same. The biodegradable composite according to one embodiment may have significantly improved mechanical properties due to the natural polymer nanofibers being uniformly dispersed and cross-linked.

Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022259278 A1 20221215	Milano Politecnico et al. (IT)	**Method to produce a casein-based biopolymer matrix fiber and thermal and acoustic insulating panel made with said fiber.** The invention concerns the production of a rigid or flexible thermal and acoustic insulating panel, made with one or more casein-based biopolymer matrix fibers, thermoset with a reduced percentage of thermoplastic fibers or bio-based and biodegradable binder.
WO 2022238354 A1 20221117	Nestle SA (CH)	**Vacuum lamination process of a rigid cellulose body for food packaging.** The present invention relates to a vacuum lamination process, in which a three-dimensional rigid body is provided for being laminated. The body has a wall section delimiting an open body volume and comprises a see-through hole penetrating the wall section. A laminate is provided and spanned at least over the body volume. A vacuum is applied at least via the see-through hole so that the laminate is laminated onto the body at least at the wall section to cover the see-through hole. The invention further relates to a laminated three-dimensional rigid body comprising a three-dimensional rigid body with a see-through hole penetrating its wall section and being covered by the laminate. Moreover, the invention relates to a container comprising two three-dimensional rigid bodies, of which at least one is said three-dimensional rigid body. The two three-dimensional rigid bodies are connected to each other to form a closed container volume.
EP 4101632 A1 20221214	Organicpac (FR)	**Food packaging.** Compostable, biodegradable and sealable food packaging, in particular of the tray type, comprising a base (1) of molded biomass fiber, covered with a protective barrier film against gases and liquids, characterized in that the said protective barrier film comprises at least one layer of cellulose nanofiber.
WO 2022210140 A1 20221006	Yokogawa Electric Corp (JP)	**Composition comprising cellulose nanofiber and lignin or complex of these components, and method for producing lignocellulose-derived material.** Provided are a composition comprising a cellulose nanofiber and lignin or a complex of these components and a method for producing a lignocellulose-derived material from a lignocellulose-based biomass with high efficiency, both of which are provided for the purpose of fully utilizing a lignocellulose-based biomass. The present invention relates to: a composition comprising a cellulose nanofiber having a sulfuric acid ester group and a lignin-derived substance; and a method for producing a lignocellulose-derived material.

Bioplásticos

Nº Publicación	Solicitante (País)	Contenido técnico
EP 4108776 A1 20221228	CO2Bioclean GmbH (DE)	**Production of biopolymers.** The present invention discloses a method for producing PHA polymer using bacteria, by using a two-step process. In the first step the bacteria are grown under heterotrophic conditions using an organic substance as carbon source and exponential growth conditions. In a second step the bacteria are then cultivated under autotrophic conditions under an atmosphere of H2, CO2 and O2, wherein the O2 content is less than 10 % (v/v) and the pressure is more than 1 barg and at least one carbon source is added before and/or during this step. By this the production of PHA with unique properties and at a high rate is possible.
WO 2022258698 A1 20221215	Covestro Netherlands BV (NL)	**Biodegradable and/or compostable biobased powders for additive manufacturing, and methods for the use thereof.** The present invention is directed to certain biodegradable and/or compostable biobased particulate compositions for additive manufacturing, such as those including a polyhydroxyalkanoate (PHA) powder, wherein the particulate composition and/or the PHA powder possesses (a) a free bulk density, as determined by ASTM D1895-96, of greater than 0.30 g/mL, and (b) a sinterability region of greater than 15 degrees Celsius. Also, the invention is directed to certain methods of manufacturing such biodegradable and/or compostable biobased particulate compositions useful as powdered build material for additive manufacturing processes. In addition, the present invention is directed to additive manufacturing processes utilizing the biodegradable and/or compostable biobased particulate compositions elsewhere described, along with the articles printed therefrom.

Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022215653 A1 20221013	Fuence Co Ltd (JP)	**Microparticles containing polyhydroxyalkanoic acid (PHA) and method for producing same.** The present invention provides: microparticles each of which contains 3-hydroxybutyric acid (3-HB) as a repeating unit for a polyhydroxyalkanoic acid (PHA) that is a biodegradable polymer and has a particle diameter of 0.2 μm or more and less than 10 μm; and a method for producing the microparticles. The microparticles according to the present invention are biodegradable, have excellent processability and also have biocompatibility, and therefore can be used in wide varieties of use applications including medicinal use applications.
WO 2022251591 A1 20221201	Kimberly Clark Co (US)	**A bioreactor and process for forming polyhydroxybutyrate directly from depolymerized polyhydroxybutyrate.** A bioreactor and process are disclosed for forming polyhydroxybutyrate directly from depolymerized polyhydroxybutyrate. In two bioreactor vessels, a microorganism product, such as one or more enzymes, are combined with the polyhydroxybutyrate-containing post-consumer product materials. The microorganism can naturally secrete the one or more enzymes or can be genetically modified to secrete the enzyme. The combination of enzymes is designed to facilitate a metabolic pathway that can depolymerize PHB, convert the resulting hydroxybutyrate to hydroxybutyryl-CoA, and in turn polymerize it into PHB. Namely, a solution for the recycling of polyhydroxybutyrate to hydroxybutyrate and back to polyhydroxybutyrate.
WO 2022250694 A1 20221201	Kimberly Clark Co (US)	**Optimization of a halophilic PHB depolymerase for industrial applications.** The present invention relates to a method for treatment of polyhydroxyalkanoate (PHA) containing post-consumer product, the method comprising contacting a post-consumer product with a polypeptide that can catalyze degradation of the PHA, the contact taking place at a temperature at least 40°C and in the presence of salt at a concentration of 1 M or greater. In a specific embodiment, the polypeptide is a wild-type PHA depolymerase expressed by a halophilic microorganism or a modified PHA depolymerase that includes one or more single-site mutations as compared to the wild-type PHA depolymerase. In another specific embodiment, the polypeptide comprising a modified polyhydroxybutyrate (PHB) depolymerase comprising one or more single-site mutations as compared to SEQ ID NO: 1, and the modified PHB depolymerase having a solubility of 10 mg/L or greater. The present invention also relates to a host cell transformed to express a polypeptide that catalyzes degradation of a PHA in the presence of salt at a concentration of 1 M or greater, wherein the host cell is selected from an E. coli cell or a halophilic microorganism.
WO 2022204533 A1 20220929	Phaxtec Inc (US)	**Polyhydroxyalkanoate compositions and methods of making the same. In alternative embodiments, provided are PHA compositions comprising a polyhydroxyalkanoate (PHA) polymer and a viscosity modifying agent.** The composition can also include a nucleating agent, an antioxidant, a dispersant, a viscosity modifying agent, an ultraviolet light inhibitor, an emulsifying agent and/or a stabilizer. Methods of manufacturing include forming the PHA composition into a polymer melt or an aqueous dispersion. The PHA composition can be used as a coating on paper, cardboard or paperboard substrates, or other surfaces, including on inks or adhesives.
WO 2022204420 A1 20220929	Phaxtec Inc et al. (US)	**Polyhydroxyalkanoate-producing bacteria and methods for making and using them.** In alternative embodiments, provided are methods for selecting, isolating and recombinantly engineering methane- and hydrogen-oxidizing autotrophs, including methanotrophic bacteria, for the production of biopolymer, renewable polymer or biodegradable polymer such as polyhydroxyalkanoate (PHA) such as polyhydroxybutyrate (PHB) and co-polymers, and products of manufacture and kits, and methods for using them to produce biopolymer, renewable polymer or biodegradable polymer. Provided are efficient methane-consuming methane- and hydrogen-oxidizing autotrophic microbes for PHA (for example, PHB and co-polymers) production and methods for using them, which in alternative embodiments the methanotrophs are genetically modified to improve C1 (methane or methanol)-to PHA conversion parameters.

Nº Publicación	Solicitante (País)	Contenido técnico
EP 4092067 A1 20221123	TotalEnergies OneTech et al. (FR)	**Process for preparing tailor-made lactide copolymers and lactide copolymers thereby obtained.** The invention relates to a process for the preparation of a lactide copolymer comprising the step of copolymerizing a lactide monomer and/or polylactic acid in the presence of at least one catalyst and optionally at least one initiator with at least one second compound, wherein said second compound comprisesa1) at least one beta-lactone of formula (I), stereoisomers, racemics or mixtures thereof;wherein each of Ra and Rb is independently hydrogen or is selected from the group comprising, C2-18alkyl, C2-18alkenyl, C2-18alkynyl, C6-12aryl, C6-12arylC1-18alkyl, heteroC1-18alkyl, heteroC2-18alkenyl, -(CH2h1-Z1-Rg, -(CH2)s2-C(=O)ORh, and -(CH2)s3-N(Ri)2, wherein each group can be unsubstituted or substituted with one or more substituents each independently selected from the group comprising halogen, C1-18alkyloxy, and -N(Rj)2, and wherein each Rj is independently selected from the group comprising hydrogen, C1-18alkyl, C2-18alkenyl, C2-18alkynyl, C6-12aryl, and C6-12arylC1-18alkyl;wherein s1, s2 and s3 are each independently an integer selected from 0 to 18;wherein Z1 is selected from the group consisting of N, S, P and O;wherein Rg and Rh are each independently selected from the group comprising C1-18alkyl, C2-18alkenyl, C2-18alkynyl, C6-12aryl, and C6-12arylC1-18alkyl;wherein each Ri is independently selected from the group comprising hydrogen, C1-18alkyl, C2-18alkenyl, C2-18alkynyl, C6-12aryl, and C6-12arylC1-18alkyl; andand/ora2) at least one diolide of formula (II), stereoisomers, racemics or mixtures thereof wherein each of Rc, Rd, Re and Rf is independently hydrogen or is selected from the group comprising C1-18alkyl, C2-18alkenyl, C2-18alkynyl, C6-12aryl, C6-12arylC1-18alkyl, heteroC1-18alkyl, heteroC2-18alkenyl -(CH2)t1-Z2-Rk, -(CH2)t2-C(=O)ORl, and -(CH2)t3-N(Rm)2, wherein each group can be unsubstituted or substituted with one or more substituents each independently selected from the group comprising halogen, C1-18alkyloxy, and -N(Rn)2, and wherein each Rn is independently selected from the group comprising hydrogen, C1-18alkyl, C2-18alkenyl, C2-18alkynyl, C6-12aryl, and C6-12arylC1-18alkyl; andwherein t1, t2 and t3 are each independently an integer selected from 0 to 18;wherein Z2 is selected from the group consisting of N, S, P and O;wherein Rk and Rl are each independently selected from the group comprising C1-18alkyl, C2-18alkenyl, C2-18alkynyl, C6-12aryl, and C6-12arylC1-18alkyl; andwherein each Rm is independently selected from the group comprising hydrogen, C1-18alkyl, C2-18alkenyl, C2-18alkynyl, C6-12aryl, and C6-12arylC1-18alkyl.
WO 2022223861 A1 20221027	Univ Cádiz et al. (ES)	**Supercritical impregnation of pharmacologically active products in polylactic acid (PLA) filaments suitable for use in 3D printing.** The present invention relates to the supercritical impregnation of pharmacologically active products in PLA filaments suitable for use in 3D printing. The invention comprises the production of PLA impregnated with a natural extract of Mangifera indica L with pharmacologically active properties using supercritical technology for use as pharmacologically active implants in biomedicine. The anti-inflammatory and antioxidant properties of the impregnated PLA filament are assessed, and it is observed that it keeps its bioactivity after 3D printing. The printed samples exhibit lower bioactivity values, which is attributed to the fact that the extract in the printed polymer is released more slowly than in the samples prior to 3D printing since the porosity of the polymer varies. If the biomedical use of the product is considered, this result is highly positive since it allows the pharmacologically active effect of the extract to be extended for a longer period of time in the case of the samples printed with the impregnated filament.
WO 2022214922 A1 20221013	W.H.in SRL (IT)	**Process for producing polyhydroxyalkanoates for food packages.** The present invention relates to a process for producing a polyhydroxyalkanoate (PHA) -based material for food packages, wherein PHA are produced starting from a low-cost plant biomass subjected to fermentation with a bacterium capable of producing high amounts of PHA.

Bioproductos químicos (biofertilizantes, biocosméticos, biofarmaceúticos...)

Biofertilizantes, bioadhesivos, etc.

Nº Publicación	Solicitante (País)	Contenido técnico
EP 4101885 A1 20221214	Henkel AG & Co KGaA (DE)	**Dimensionally stable adhesive composition containing enzymatically modified starch.** The invention relates to a dimensionally stable adhesive composition comprising enzymatically modified starch and to the use of the adhesive composition as a glue stick.

Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022255049 A1 20221208	Nitto Denko Corp (JP)	**Pressure-sensitive adhesive composition and pressure-sensitive adhesive tape.** A pressure-sensitive adhesive composition comprising: a combination of a ß-1,3-glucan derivative obtained by introducing acyl groups into ß-1,3-glucan, the ß-1,3-glucan derivative having a degree of acyl substitution of 2.6 or higher but less than 3.0, and a compound having both a (meth)acryloyl group and a functional group reactive with a hydroxyl group and/or a product of reaction between the ß-1,3-glucan derivative and a compound having both a (meth)acryloyl group and a functional group reactive with a hydroxyl group; and a photoradical generator.
WO 2022211700 A1 20221006	Organoclick AB (SE)	**Adhesive composition comprising lupine protein and lignin.** The present invention relates generally to an aqueous adhesive composition comprising lignin and a source of lupine protein. The invention further relates to a method for gluing together two or more surfaces of a material using said aqueous adhesive composition, use of said aqueous adhesive composition and a material treated with said aqueous adhesive composition.
WO 2022235189 A1 20221110	Organoclick AB (SE)	**Biobased binder compositions for airlaid nonwoven materials.** The present invention relates to biobased binder compositions which are environmentally benign, renewable, compostable and/or biodegradable. The biobased compositions comprise chitosan, an acid and a plasticizer. By treating an airlaid nonwoven material with a biobased binder according to the present invention, it is possible to provide an airlaid nonwoven material exhibiting higher elongation, i.e., elongation at break, and strength compared to an airlaid nonwoven material treated with previously available biobased binders.
EP 4086295 A1 20221109	Prefere Resins Holding GmbH (DE)	**Resins from aldehydes and organic aldehyde-reactive compounds.** This invention relates to a resin made from an aldehyde component which comprises 5-hydroxymethyl furfural ("HMF"), and a reactive aromatic compound which comprises lignin, characterised in that the HMF is a mixture comprising monomeric 5-hydroxymethyl furfural, and oligomers of HMF wherein the mass fraction of oligomers in the HMF is not more than 1 %, based on the sum of masses of the HMF monomer and the masses of the HMF oligomers present in the said mixture, and methods of use of these resins as binders and adhesives for inorganic and organic materials including wood, engineered wood, paper, cardboard, stone, concrete, plaster, thermoplastic and duroplastic polymers, metals, textiles, fibres including also carbon fibres, nonwovens, felts, leather, ceramics, and glass.
EP 4095118 A1 20221130	Rigenera SRL (IT)	**Biological fertilizer product and corresponding production method.** The biological fertilizer product comprises composted organic material that comes only from the bovine supply chain, at least one lactobacillus and a fungi-based biocontrol agent; the biological fertilizer product is obtained through a controlled atmosphere method, with regular movement of the decomposing organic material.
WO 2022261349 A1 20221215	Solugen Inc (US)	**Bio-based cleaner additive.** A detergent additive comprising (i) a biochelant; (ii) a ring-opener; and (iii) a solvent. A method of treating a contaminated surface comprising contacting a detergent and a detergent additive with the contaminated surface wherein the detergent additive comprises (i) a biochelant; (ii) a ring-opener; and (iii) a solvent.
WO 2022200974 A1 20220929	Stora Enso OYJ (FI)	**Biobased adhesive mixture and the use of said adhesive mixture.** The present invention relates to adhesive mixtures. In particular, the invention concerns the use of lignin in biobased hot-melt (non-pressure sensitive) and pressure sensitive adhesives, as well as novel adhesive mixtures suitable for use as such adhesives. The adhesive mixture comprises 25-85 wt-% lignin, 10-75 wt-% plasticizer, 0-50 wt-% tackifier and 0-40 wt-% waxes, by solid weight. The combined amount of lignin, plasticizer, tackifier and waxes is at least 90 wt-%, by solid weight, of the adhesive mixture.
WO 2022254445 A1 20221208	Technion Res & Dev Foundation et al. (IL)	**Dry muco-adhesive compositions and use thereof.** A composition and method for the administration of therapeutic and/or diagnostic agents is provided. Specifically, a dry hybrid system, composed of bio adhesive polymer that harbors drug-loaded lipid nanoparticles, and use thereof for the administration of active agents e.g., anti-cancer agents or biological agents, is provided.
WO 2022219226 A1 20221020	UPM Kymmene Corp (FI)	**A binder composition free of phenol compound.** The invention relates to a method for producing a binder composition, without using a compound selected from the class of phenols. The method comprises: (i) heating an aqueous composition comprising lignin in the presence of a catalyst; (ii) mixing a crosslinking agent with the aqueous composition from (i) and heating the same at a temperature of 60 – 95 °C for pre-polymerizing lignin and crosslinking agent; (iii) mixing tannin with the aqueous composition from (ii) for polymerizing tannin with the pre-polymerized lignin and crosslinking agent until a binder composition with a predetermined viscosity value is formed; wherein the molar ratio of crosslinking agent to lignin and tannin is 0.5 - 1.7.

Biocosméticos, Biofarmaceúticos		
Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022253513 A1 20221208	Beiersdorf AG (DE)	**Thermostable, polyacrylate-free cosmetic preparation.** The invention relates to a cosmetic preparation containing a) hydroxypropyl methyl cellulose, b) xanthan gum, and c) hydrogenated rape seed oil which is free from glycerol tripalmitate, and the preparation is free from substances on the basis of polyacrylates, carbomers and polyvinylpyrrolidones.
ES 2925293 A1 20221014	Cellbitec SL (ES)	**Nutraceutical formulation indicated to reduce the risk of suffering diseases related to chronic inflammation and oxidative stress.** The present invention describes a natural composition obtained from a mixture of Ocimum basilicum seed oil and juice extracted from the fruit of Argania spinosa to be used in food supplements, nutraceutical, cosmetic and pharmaceutical formulations whose objective is to contribute to the reduction of the chronic inflammation and oxidative stress. The functional characteristics of the two constituent elements of the formulation present a clear additive anti-inflammatory and antioxidant activity that are of interest for the elaboration of nutraceutical products capable of acting on pathophysiological processes related to the aforementioned actions in order to obtain an improvement in the development of different pathological states such as chronic degenerative diseases, inflammatory and atopic dermatological diseases.
ES 2925125 A1 20221013	Cellbitec SL (ES)	**Food and functional use of ocimum basilicum seed oil.** The present invention describes the use of Ocimum basilicum seed oil as a functional food, as well as its use as a component of food products, nutritional supplements, nutraceutical formulations, cosmetics and animal feed whose objective is to contribute to the increase of at least one fatty acid Ω-3 fatty acid in the consumer. Ocimum basilicum seed oil has an excellent lipid profile to be used as a functional food capable of helping to regulate pathological situations related to an alteration in circulating lipid levels. In addition, this disclosure highlights the use of said oil as food due to its absence of toxicity, favorable metabolic incorporation and high nutritional capacity.
EP 4108094 A1 20221228	Kaffee Bueno APS (DK)	**Coffee melanoidin nanoparticles and nanofibers.** The invention relates to a process for preparing a melanoidin product, the process comprising:a) an extraction step in which coffee grounds are treated with an extraction agent with a pH value greater than 7 to extract a melanoidin-containing solute in a fluid phase of the extraction agent;b) a first separation step in which the fluid phase is separated from the coffee grounds;c) a precipitation step in which the fluid phase is contacted (i) with an acid to obtain an acidic mixture with a pH value lower than 4 or (ii) with an organic phase separation agent and with an acid to obtain a mixture with a pH value in the range of from 4 to 8, thereby forming precipitates containing melanoidin; andd) a second separation step in which the formed precipitates are separated from the acidic mixture. The invention further relates to melanoidin nanoparticles and melanoidin nanofibers obtained from coffee grounds.
WO 2022254116 A1 20221208	Laboratoires M&L (FR)	**Cosmetic use of an oily extract from solid residue of immortelle as a skin brightening agent.** The present invention relates to the cosmetic use of an oily extract from solid residue of immortelle as a brightening agent for the complexion. The invention also relates to a cosmetic composition comprising, in a physiologically acceptable medium, an oily extract of immortelle draff and hexylresorcinol, as well as to the uses of this composition.
WO 2022238727 A1 20221117	Momand Hossay (GB)	**Methods for preparing white heirloom tomato-based compositions for skin lightening via enhanced glutathione, and associated compositions thereof.** A method for preparing white heirloom tomato-based composition for skin lightening via enhance glutathione production, the method including the steps of, sampling and decontaminating a tomato fruit sample via vigorous washing; freeze-drying and homogenising the tomato fruit sample to produce tomato fruit powder; preparing tomato fruit powder stock solution using the tomato fruit powder; and, dissolving and mixing the tomato fruit powder stock solution (100mg/ml) in distilled water.
EP 4108225 A1 20221228	Nanomnia Srl (IT)	**Method for producing micro/nano capsules containing extracts of microalgae and/or cyanobacteria for cosmetic use.** Method for producing cosmetic micro/nano capsules containing at least one antioxidant compound preferably extracted from microalgae and/or cyanobacteria, characterized in that it comprises the following steps:a) solubilising the antioxidant compound in an organic solvent;b) mixing the solution obtained in step a) with an aqueous solution of lysozyme to obtain an antioxidant complex formed by the antioxidant compound and by the lysozyme;c) evaporating at least a part of the organic solvent present in the solution obtained in step b);d) mixing the solution obtained in step c) with an aqueous solution of hyaluronic acid;e) homogenising the solution obtained in step d) to produce a homogeneous suspension of the antioxidant complex;f) adding to the homogeneous suspension obtained in step e) an aqueous solution of a cross-linking compound and performing the homogenisation of the aqueous solution of a cross-linking compound in the homogeneous suspension obtained in step e) to produce the micro/nano capsules containing the antioxidant compound.

Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022208385 A1 20221006	SVAS Biosana SpA (IT)	**Formulation for topical use, based on dry vegetable extracts of known titer, for the treatment of lipodistrofie and its production method**. A formulation in the form of cream or gel or liquid with a lipolytic, antioxidant an elasticizing effect comprises, among the components dry extracts with a known titer with a percentage capable of exerting a reducing effect on adipocytes, leading to the re-differentiation thereof, a firming effect on the skin and a restoration of microcirculatory activity. The base composition comprises : Butyrospermum Parkii Butter (or Shea butter) (1% w/w), kola nut dry extract (D.E.) (0.6% w/w), Butcher's Broom dry extract (0.5% w/w), Fucus dry extract (0.5% w/w) and at least one of the dry extracts indicated below selected from the group comprising : D.E. Horse chestnut, D.E. Arnica, D.E. Malva, D.E. Witch hazel. Hesperidin or a derivative thereof, and L- Carnitine or a derivative thereof, is associated with the aforementioned extracts, with a percentage by weight with respect to the total weight of the formulation not less than 0.05 - 1.0% and 0.01-2.0%, respectively. The method of preparing such a formulation is also described.
WO 2022253966 A1 20221208	Univ Copenhagen (DK)	**Peptides derived from ruminococcus torques.** The present invention relates to polypeptides derived from Ruminococcus torques, and polypeptide fragments and variants thereof useful for treatment and/or prevention of metabolic disorders, muscle disorders and injuries, and bone disorders, and host cells comprising said polypeptides, polypeptide fragments or variants thereof for use as a probiotic or as a Live Biopharmaceutical Product (LBP).
WO 2022222895 A1 20221027	Yunnan Inst Tropical Crops (CN)	**Natural rubber whey fermentation product extract, preparation method therefor and use thereof.** The present application relates to a natural rubber whey fermentation product extract, a preparation method therefor and a use thereof, and relates in particular to a natural rubber whey fermentation product extract, a preparation method therefor, a use thereof in the preparation of a cosmetic composition, and a corresponding cosmetic composition. The content of the natural rubber whey fermentation product extract or a concentrate thereof in the cosmetic composition is 0.01%-100%. The natural rubber whey fermentation product extract of the present application is obtained by fermentation by using natural rubber whey and rice as fermentation substrates by passing through yeast and lactic acid bacteria, and contains ergothioneine, glutathione, β-glucan, amino acids, quercetin, fruit acid, glycerin, vitamins, minerals, and other active ingredients.

Bioaditivos alimentarios

Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022233885 A2 20221110	Cambridge Glycoscience Ltd (GB)	**Soluble and insoluble saccharide compositions and related methods.** Compositions comprising soluble oligosaccharides and insoluble saccharides are provided. Methods for the formation of the compositions, food products, baked goods, or sweeteners, including the production of the saccharide particles, the saccharide particles with various ratios and properties of the saccharides, and the uses of the same are also provided.
WO 2022261116 A1 20221215	Corn Products Dev Inc (US)	**Gelling citrus fibers and methods of manufacture.** The technology disclosed in this specification pertains to pectin containing cellulosic materials. The cellulosic material is modified so that it can form strong gels when dispersed in aqueous solution. Also disclosed are methods for modifying the cellulosic materials, including, at least in some embodiments, methods to monitor changes in the infrared spectrum of the cellulosic material that happen during a modification reaction to control the reaction and obtain end products capable of making gels having the desired gel strength.
WO 2022258609 A1 20221215	Givaudan SA (CH)	**Flavour delivery system.** A flavour delivery system is provided. Methods for making the flavour delivery product and the consumables containing the food delivery product are also disclosed. The consumable may be a plant-based meat analogue that closely mimics the flavour, aroma and mouthfeel of animal-based protein products over the entire chewing experience.
WO 2022210557 A1 20221006	J Oil Mills Inc (JP)	**Starch composition for food.** A starch composition for a food, said starch composition comprising a starch as component (a) and an emulsifier as component (b), wherein: at least a part of component (a) and at least a part of component (b) form an amylose-lipid complex; the peak molecular weight of component (a) is from 2.7×105 to 2.3×106 inclusive; component (b) is at least one selected from the group consisting of a monoglycerol fatty acid ester and a sucrose fatty acid ester having an HLB of 4-16 inclusive; the free enthalpy, per dry mass of the composition, of the differential amylose-lipid complex is 0.1-20 J/g inclusive; the degree of swelling in cold water at 25°C of the starch composition for a food is 5.0-40 inclusive; and the soluble fraction at 25°C is more than 0 mass% and not more than 20 mass%.

Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022261450 A1 20221215	Kraft Foods Group Brands LLC (US)	**Plant-based cream cheese product and method of making a plant-based cream cheese product.** A plant-based cheese product, particularly cream cheese type products, is provided herein. The plant-based cheese products are in the form of an emulsion comprising a plant-based protein, a stabilizer, a starch-based thickening agent, and a fat component. The plant-based cheese has a spreadable texture and opaque appearance at both refrigerated and elevated temperatures.
WO 2022248352 A1 20221201	Nestle SA (CH)	**Stable thickeners and nutritional products to promote safe swallowing for individuals with dysphagia and methods of making and using same.** The present disclosure is related to a stable nutritional product, a thickener formulated for dilution into the nutritional composition, a use of the nutritional product, a method for making the nutritional product, a method for enhancing physical stability, especially with regards to rheological and in particular "cohesive" properties of the nutritional product, and a related system. The physical stability, especially with regards to rheological and in particular cohesive properties of a nutritional product consumed in liquid form and containing a beta-glucan can be enhanced by reducing and/or preventing growth of microorganisms in the nutritional product, and/or deactivating enzymes in the nutritional product, and/or preventing hydrolysis of the beta-glucan in the nutritional product.
WO 2022235850 A1 20221110	Rajakaruna Uppala (US)	**Food additive as a flavor enhancer or texture modifier, and method of making the same.** A method of manufacturing food additives uses banana stem inner core (banana pseudostem) as a flavor enhancer, texture modifier, and/or process improvement additive. Such banana-pseudostem food additives can be used in food product recipes as taste modifiers, carriers of tasting agents, flavor enhancers, flavor retainers, flavor accepters, or flavoring agents. Also, such banana-pseudostem food additives can be used as texture modifiers, food product softeners, water retainers, volume modifiers, and color modifiers.
WO 2022218689 A1 20221020	Unilever IP Holdings BV (NL) et al.	**Iron-fortified savoury concentrate.** The present invention relates to a savoury concentrate comprising a fortificant system comprising a source of iron and a biopolymer matrix, and taste-imparting components. The invention further relates to a process for manufacturing the concentrate. The invention also relates use of a biopolymer in a fortificant system comprising a source of iron as a colour stabiliser in a savoury concentrate comprising the fortificant system.
WO 2022256862 A1 20221215	Univ Adelaide (US)	**Food composition.** A food additive composition comprising flour or meal made from seeds of a plant of the genus Plantago, wherein the ω−3 to ω−6 fatty acid molar ratio of the seeds is at least 2.0:1.
WO 2022232763 A1 20221103	Vertosa Inc (US)	**Emulsions and derivatives for infusing hydrophobic active agents into an edible product.** Provided are edible products infused with an emulsion containing one or more active agents. An edible product infused with an emulsion composition, wherein the product comprises a base and an emulsion composition wherein the emulsion composition comprises one or more active agents, an emulsifier, a carrier oil, and water; wherein the emulsifier is Quillaja extract or gum acacia; wherein the carrier oil is at least 1 time of the cannabinoid and the emulsifier is at least 0.05 times the total amount of the carrier oil and the one or more active agent; and wherein the product has a main active agent and the product has a time to peak drug concentration (Tmax) of the active agent and metabolites of the active agent of less than 120 minutes.

Bioproductos alimenticios para animales

Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022221481 A1 20221020	Academia Sinica et al. (US)	**Botanical supplement and method for preventing diseases, promoting growth and survival of an animal by using the same.** Provided is an animal feed composition including a plant-based feed additive. Also provided is a method for promoting overall health condition of an animal, including increase of feed efficiency and decrease of feed converting rate, increase of probiotics and decrease of pathogens in gut microbiota of pigs, anti-inflammation, affecting primary metabolism, promoting growth and survival rate, and preventing or treating diseases caused by pathogenic bacteria, porcine reproductive and respiratory syndrome virus (PRRSV).
WO 2022246015 A1 20221124	Blue Buffalo Entpr Inc (US)	**Pet food composition.** Described is a pet food composition that combines a fermentate that contains a non- viable, non-pathogenic bacteria and a prebiotic that contains an oligosaccharide component to achieve a gut health benefit in a companion animal.

Nº Publicación	Solicitante (País)	Contenido técnico
WO 2022261303 A1 20221215	Cargill Inc (US)	**Method of preparing a cooked chunk pet food product.** A cooked chunk pet food product is prepared by grinding animal muscle meat and animal organ meat and mixing the animal muscle meat and the animal organ meat in a ratio of muscle meat to organ meat of from about 1:1 to about 10:1 wt% in a mixer for from about 5 to 20 minutes to form a mixed meat component, mixing with additional ingredients to prepare a pet food base formulation that is disposed in a casing and cooked to provide a sliceable pet food log. The pet food log is then diced and/or shredded provide a chunk pet food product having an average piece size of from about 0.25 to about 0.75 inches in the largest dimension. Products made by the process are also described.
EP 4070666 A1 20221012	CIIMAR (PT) et al.	**Enzyme-rich extract and use thereof in pre-treatment of plant feedstuff-based diets.** The present disclosure relates to an enzyme-rich extract obtained through solid-state fermentation (SSF) of Brewer's Spent Grain (BSG) to be used as a feed additive in animal diets, preferably fish diets. The present patent application also discloses a pre-treatment process of plant feedstuff-based (PF) diets in order to increase the nutrient bioavailability of said diets, thus increasing their nutritional value.
WO 2022238979 A1 20221117	Denova Inc et al. (CA)	**Single cell protein products containing methanol-fed methylotrophs and uses thereof.** Provided herein are methylotrophic single cell protein products as a source of protein for use in a variety of methods. Also provided are animal feeds comprising the methylotrophic single cell protein products and methods of making and using the methylotrophic single cell protein products.
WO 2022251947 A1 20221208	Sixring Inc (CA)	**Compositions for use in fish silage.** A method to perform fish silage wherein a low fuming acid composition is used, said method comprises the steps of: providing fish waste; providing a container adapted to receive said fish waste; providing a modified aqueous acid composition comprising: an acid selected from the group consisting of: hydrochloric acid and sulfuric acid, and combinations thereof; and at least one acid-modifying compound; such that the modified acid composition has a pH ranging from 0 to 5, mixing the fish waste with the modified aqueous acid composition together in said container; allowing the modified aqueous acidic composition to be in contact with the fish waste for a period of time sufficient to convert the fish waste into animal feed, wherein the pH of the composition comprising the modified aqueous acid and the fish waste ranges from 2 to 4 preferably from 2 to 4, more preferably from 2.5 to 3.5; optionally, adding an amine-containing compound to the silage composition so as to increase the pH of the composition prior to being used as animal feed.
WO 2022243984 A1 20221124	The Cawthron Inst Trust Board (NZ)	**Animal feed additive and methods for its preparation.** Animal feed additives comprising the dried biomass of Asparagopsis containing enhanced levels of bromoform are des cribed. Methods of culturing Asparagopsis and proces sing the harvested biomas s that are particularly suited to the preparation of the animal feed additive are also des cribed.
WO 2022226276 A1 20221027	THF Publications Inc (US)	**Pet chew article containing luffa.** A pet chew article comprising luffa fibers and a polymer composition. The pet chew article may be formed by supplying luffa fibers, supplying a polymer composition combining the luffa fibers with the polymer composition and forming the 5 pet chew article from the luffa fibers and the polymer composition.
WO 2022215719 A1 20221013	Tokuyama Corp et al. (JP)	**Methane gas reducing agent.** The methane gas produced during ruminant digestion is reduced by feeding the ruminant a feed containing unfermented coffee grounds.
WO 2022235563 A1 20221110	Triton Algae Innovations Inc (US)	**Color-fast edible compositions and methods of producing same.** Provided herein are color-fast edible compositions and methods of making the same. In some cases, the color-fast edible compositions comprise a comprising an exogenous protein component and a biomass comprising cells of a pigmented algae. The pigmented algal cells may be physically associated with the exogenous protein component such that the pigmented algal cells confer a pigmentation to the edible compositions and are substantially dissociable from the exogenous protein component. Further provided herein are food products (e.g., meat substitutes, fish or shellfish substitutes) comprising the color-fast edible compositions of the disclosure.

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