

Este Boletín de Vigilancia Tecnológica en Biomasa es fruto del trabajo conjunto de la Oficina Española de Patentes y Marcas (OEPM), del Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT) y de BIOPLAT, Plataforma Española Tecnológica y de Innovación 'BIOMASA PARA LA BIOECONOMÍA'.

Se trata de una publicación trimestral que ofrece una información precisa, esquemática y de rápida lectura sobre una selección de las últimas patentes españolas, europeas y PCT publicadas, relativas a la biomasa.

El boletín contiene una introducción sobre un aspecto de interés relacionado con el sector y, a continuación, se procede a llevar a cabo un análisis de las últimas patentes publicadas en el ámbito de la BIOENERGÍA (biocombustibles sólidos, generación eléctrica y térmica, syngas, biogás, bioalcoholes, biodiésel, bio-jet fuel y otros biocombustibles como el bio-hidrógeno, bio-oils, biopropano, etc.) y los BIOPRODUCTOS (biomateriales como biocomposites, biofibras y bioplásticos; bioproductos químicos como los biofertilizantes, biocosmético y biofarmacéuticos; bioaditivos alimentarios y bioproductos alimenticios para animales, entre otros).

A través del número de publicación de cada patente, un enlace permite consultar el documento completo e incluso se puede disponer de una traducción de la descripción de la patente mediante la herramienta Patent Translate.

En caso de desear recibir periódicamente este Boletín de Vigilancia Tecnológica, por favor cumplimente el formulario de suscripción al que puede acceder a través de este [link](#).

## INTRODUCCIÓN

La **Bioeconomía** promueve el uso eficiente de las materias primas biológicas y de los residuos orgánicos, así como de otros recursos alternativos como las biomasa acuáticas tales como las microalgas. En los próximos años, se prevé un rápido crecimiento de la bioeconomía en todo el mundo para dar respuesta a la futura escasez de recursos fósiles y a la creciente problemática medioambiental (cambio climático, contaminación, aumento de la demanda energética y la producción de residuos, etc.)

Un instrumento clave para el desarrollo de la bioeconomía son las biorrefinerías. Éstas se caracterizan por transformar de manera sostenible la biomasa en un amplio espectro de bioproductos y biocombustibles combinando eficientemente procesos biológicos, térmicos, físicos y químicos.

En la Tabla 1 se recogen algunos de los múltiples proyectos europeos en el ámbito de los bioproductos de los programas H2020 y Life+ actualmente en curso con participación de empresas españolas y fecha de finalización posterior a Junio de 2019.

**Tabla 1.** Proyectos europeos con participación de empresas españolas

<b>PROGRAMA HORIZON 2020</b>	
<b>VALUEWASTE: Unlocking new VALUE from urban bioWASTE</b>	
<b>Fecha de inicio:</b> 01/11/ 2018	<b>Fecha de finalización:</b> 31/10/2022
<b>Coordinador:</b> CETENMA (España)	
<b>Participantes:</b>	
<ul style="list-style-type: none"> <li>• Eurizon (España)</li> <li>• Savonia University of Applied Sciences (Finlandia)</li> <li>• Cespa Servicios Urbanos de Murcia (España)</li> <li>• Ayuntamiento de Murcia (España)</li> <li>• ITAINNOVA (España)</li> <li>• Unibio (Dinamarca)</li> <li>• AENOR (España)</li> <li>• NuReSys (Bélgica)</li> <li>• Ekobalans Fenix (Suecia)</li> <li>• INDEREN (España)</li> <li>• Fundación Gaiker (España)</li> <li>• Entomo Consulting (España)</li> <li>• SEAH International (Francia)</li> <li>• .....</li> </ul>	
<b>SCALIBUR: Scalable technologies for bio-urban waste recovery</b>	
<b>Fecha de inicio:</b> 01/11/ 2018	<b>Fecha de finalización:</b> 31/10/2022
<b>Coordinador:</b> ITENE (España)	
<b>Participantes:</b>	
<ul style="list-style-type: none"> <li>• AERIS (España)</li> <li>• ASA Spezialenzyme (Alemania)</li> <li>• CENER-CIEMAT (España)</li> <li>• CLUBE (Grecia)</li> <li>• Exergy (Holanda)</li> <li>• FCC (España)</li> <li>• Greenovate Europe (Bélgica)</li> <li>• KOUR (Italia)</li> <li>• LUND (Suecia)</li> <li>• Ayuntamiento de Madrid (España)</li> <li>• IRIS (España)</li> <li>• Waterschap Brabantse Delta (Holanda)</li> <li>• .....</li> </ul>	
<b>EFFECTIVE: Advanced Eco-designed Fibres and Films for large consumer products from biobased polyamides and polyesters in a circular Economy perspective</b>	
<b>Fecha de inicio:</b> 01/06/2018	<b>Fecha de finalización:</b> 31/05/2022
<b>Coordinador:</b> Aquafil (Eslovenia)	
<b>Participantes:</b>	
<ul style="list-style-type: none"> <li>• Aquafil (Italia)</li> <li>• Sudzucker (Alemania)</li> <li>• Balsan (Francia)</li> <li>• Hennes &amp; Mauritz (Suecia)</li> <li>• Bio-Mi (Croacia)</li> <li>• Fundación Circe (España)</li> <li>• Circular Change (Eslovenia)</li> <li>• .....</li> </ul>	
<b>EMBRACED: Establishing a Multi-purpose Biorefinery for the Recycling of the organic content of AHP waste in a Circular Economy Domain</b>	
<b>Fecha de inicio:</b> 01/06/2017	<b>Fecha de finalización:</b> 31/05/2022
<b>Coordinador:</b> Fater (Italia)	
<b>Participantes:</b>	
<ul style="list-style-type: none"> <li>• Fraunhofer Gesellschaft (Alemania)</li> <li>• Fundación Circe (España)</li> <li>• AEB Exploitatie (Holanda)</li> <li>• TerraCycle (Inglaterra)</li> <li>• Procter &amp; Gamble (Suiza)</li> <li>• Saponia (Croacia)</li> <li>• Fertinagro Biotech (España)</li> <li>• .....</li> </ul>	

**ECOAT: ECO sustainable multifunctional biobased COATings with enhanced performance and end of life options**

**Fecha de inicio:** 01/05/2019  
**Coordinator:** INSTM (Italia)

**Fecha de finalización:** 30/04/2022

**Participantes:**

- Fraunhofer Gesellschaft (Alemania)
- University of Westminster (Inglaterra)
- Universidad de Alicante (España)
- Kneia (España)
- TIPA (Israel)
- CELABOR (Bélgica)
- IRIS (España)
- Condensia (España)
- Bio-Mi (Croacia)
- Organik Kimya (Turquía)
- .....

**URBIOFIN: Demonstration of an integrated innovative biorefinery for the transformation of Municipal Solid Waste (MSW) into new BioBased products**

**Fecha de inicio:** 01/06/2017  
**Coordinator:** IMECAL (España)

**Fecha de finalización:** 31/12/2021

**Participantes:**

- AINIA (España)
- URBASER (España)
- Biomasa Peninsular (España)
- Universidad de Valladolid (España)
- Exergy (Inglaterra)
- Novozymes (Dinamarca)
- WR-RIKILT (Holanda)
- CIEMAT (España)
- VISUM (Irlanda)
- NaturePlast (Francia)
- IRIAF (España)
- BCM Bioeconomy Cluster Management (Alemania)
- NATRUE AISBL (Bélgica)
- CSIC (España)
- .....

**BIOMOTIVE: Advanced BIObased polyurethanes and fibres for the autoMOTIVE industry with increased environmental sustainability**

**Fecha de inicio:** 01/06/2017  
**Coordinator:** Selena Labs Spolka Z Ograniczona Odpowiedzialnoscia (Polonia)

**Fecha de finalización:** 31/05/2021

**Participantes:**

- MAIER (España)
- Metsa Fibre (Finlandia)
- Novamont (Italia)
- TITK (Alemania)
- ICSO (Polonia)
- ISC (Rumanía)
- Fundación Cartif (España)
- .....

**BioBarr: New bio-based food packaging materials with enhanced barrier properties – BioBarrier**

**Fecha de inicio:** 01/06/2017  
**Coordinator:** Tecnoalimenti (Italia)

**Fecha de finalización:** 31/05/2021

**Participantes:**

- BIO-ON (Italia)
- CHIMIGRAF (España)
- CNTA (España)
- DTU (Dinamarca)
- Icimendue (Italia)
- TTY-SAATIO (Finlandia)

**Pro-Enrich: Development of novel functional proteins and bioactive ingredients from rapeseed, olive, tomato and citrus fruit side streams for applications in food, cosmetics, pet food and adhesives**

**Fecha de inicio:** 01/05/2018

**Fecha de finalización:** 30/04/2021

**Coordinador:** Teknologisk Institut (Dinamarca)

**Participantes:**

- Bangor University (Inglaterra)
- Innorenew Coe (Eslovenia)
- GEA Group (Alemania)
- Anecoop (España)
- Vertech Group (Francia)
- Chimar (Grecia)
- Eurizon (España)
- Olivar de Segura (España)
- Natac Biotech (España)

**FUNGUSCHAIN: Valorisation of mushroom agrowastes to obtain high value products**

**Fecha de inicio:** 01/11/2016

**Fecha de finalización:** 31/10/2020

**Coordinador:** BDS (Holanda)

**Participantes:**

- Fundación AITIIP (España)
- Monaghan Mushrooms (Irlanda)
- Biozoon (Alemania)
- Condensia (España)
- ECNP (Italia)
- Neem Biotech (Inglaterra)
- Universidad de Alicante (España)
- OWS (Bélgica)
- Saponia (Croacia)
- KTH Royal Institute of Technology (Suecia)
- BIOTREND (Portugal)
- Corbion (Holanda)
- .....

**LIBBIO: Lupinus mutabilis for Increased Biomass from marginal lands and value for BIOrefineries**

**Fecha de inicio:** 01/10/2016

**Fecha de finalización:** 30/09/2020

**Coordinador:** Innovation Center Iceland (Islandia)

**Participantes:**

- Hanzehogeschool Groningen (Holanda)
- DIL (Alemania)
- CSIC (España)
- Instituto Superior de Agronomia (Portugal)
- Agricultural University of Athens (Grecia)
- University of Agricultural Sciences and Veterinary Medicine of IASI (Rumania)
- Hoehere Bundeslehr- Und Forschungsanstalt Fuer Landwirtschaft Raumberg-Gumpenstein (Austria)
- .....

**PULPACKTION: Optimised moulded pulp for renewable packaging solutions**

**Fecha de inicio:** 01/10/2016

**Fecha de finalización:** 30/09/2020

**Coordinador:** Rottneros Packaging (Suecia)

**Participantes:**

- Borregaard (Noruega)
- Genencor International (Holanda)
- Novamont (Italia)
- Tecnar (Alemania)
- Mi-Plast (Croacia)
- IRIS (España)
- ITENE (España)
- CHIMIGRAF (España)
- .....

**Smartmushroom: Smart Management of spent mushroom substrate to lead the MUSHROOM sector towards a circular economy**

**Fecha de inicio:** 01/08/2018

**Fecha de finalización:** 31/07/2020

**Coordinador:** ASOCHAMP RIOJA (España)

**Participantes:**

- NOVIS (Alemania)
- IDECAL (España)
- ECOSOIL (Serbia)

**POLYBIOSKIN: High performance functional bio-based polymers for skin-contact products in biomedical, cosmetic and sanitary industry**

**Fecha de inicio:** 01/06/2017

**Fecha de finalización:** 31/05/2020

**Coordinador:** IRIS (España)

**Participantes:**

- INSTM (Italia)
- University of Westminster (Inglaterra)
- ARMINES (Francia)
- Faculty of Technology, University of Novi Sad (Serbia)
- University Gent (Bélgica)
- Bioinicia (España)
- European Bioplastics (Alemania)
- .....

**BARBARA: Biopolymers with advanced functionalities for building and automotive parts processed through additive manufacturing**

**Fecha de inicio:** 01/05/2017

**Fecha de finalización:** 30/04/2020

**Coordinador:** Fundación AITIIP (España)

**Participantes:**

- Universidad de Alicante (España)
- KTH Royal Institute of Technology (Suecia)
- FECOAM (España)
- Celabor (Bélgica)
- Università Degli Studi di Perugia (Italia)
- TecnPackaging (España)
- Nurel (España)
- Acciona Construcción (España)
- .....

**CIRC-PACK: Towards circular economy in the plastic packaging value chain**

**Fecha de inicio:** 01/05/2017

**Fecha de finalización:** 30/04/2020

**Coordinador:** Fundación Circe (España)

**Participantes:**

- Fundación AITIIP (España)
- Novamont (Italia)
- Bumaga (Holanda)
- Saponia (Croacia)
- Grupo Sada (España)
- AENOR (España)
- Ekodenge (Turquía)
- Ecoembalajes España (España)
- Calaf Grup (España)
- Ocu Ediciones (España)
- Plastipolis (Francia)
- .....

**KARMA2020: Industrial Feather Waste Valorisation for Sustainable KeRatin based Materials**

**Fecha de inicio:** 01/01/2017

**Fecha de finalización:** 31/12/2019

**Coordinador:** Fundación Cidetec (España)

**Participantes:**

- Grupo Sada (España)
- VTT (Finlandia)
- Rise (Suecia)
- CENTEXBELL (Bélgica)
- AIMPLAS (España)
- IBWCh (Polonia)
- CNRS (Francia)
- Avantium (Holanda)
- FKUR (Alemania)
- Fertiberia (España)
- Ciaotech (Italia)
- DLABS (Israel)
- .....

## PROGRAMA Life +

LIGNOBIOLIFE - Development of high value-added bioproducts from forest waste through microwave technology

**Fecha de inicio:** 03/09/2018

**Fecha de finalización:** 02/09/2022

**Coordinador:** Fundación General Universidad de Alcalá (España)

**Participantes:**

- ADASUR (España)
- DOURO (Portugal)
- DUECEIRA (España)
- EROVIA (España)
- Eco2 (España)
- INIA (España)
- Neoliquid (España)

LIFE ALGAECAN - Adding sustainability to the fruit and vegetable processing industry through solar-powered algal wastewater treatment

**Fecha de inicio:** 02/10/2017

**Fecha de finalización:** 31/12/2020

**Coordinador:** Fundación CARTIF (España)

**Participantes:**

- AlgEn (Eslovenia)
- HUERCASA (España)
- Universidad Técnica Nacional de Atenas (Grecia)
- Karlsruhe Institute of Technology (Alemania)
- Vipi (Eslovenia)

LIFE SARMIENTO - Demonstration of an innovative solution to reduce GHG emissions in vineyards while improves the soil in arid areas

**Fecha de inicio:** 01/09/2016

**Fecha de finalización:** 31/12/2020

**Coordinador:** Microgaia Biotech SL (España)

**Participantes:**

- Bodegas del Rosario (España)
- EuroVértice (España)

LIFE CLEAN UP - Validation of adsorbent materials and advanced oxidation techniques to remove emerging pollutants in treated wastewater

**Fecha de inicio:** 01/10/2017

**Fecha de finalización:** 30/09/2020

**Coordinador:** Universidad Católica San Antonio de Murcia (España)

**Participantes:**

- Consiglio Nazionale delle Ricerche (Italia)
- Asociación Empresarial de Investigación Centro Tecnológico Nacional de la Conserva (España)
- Regenerate Levante (España)
- Hidrogea (España)
- Università degli Studi di Bari Aldo Moro (Italia)
- Hidrotec Water Treatment (España)

LIFE CITRUSPACK - Revalorization strategies within the circular economy for the use of citrus waste in green packaging and cosmetics

**Fecha de inicio:** 01/07/2017

**Fecha de finalización:** 30/06/2020

**Coordinador:** Fundación AIITIP (España)

**Participantes:**

- AMC Innova Juice and Drinks (España)
- EROSKI (España)
- Plastipolis (France)
- OWS Nv (Bélgica)
- TECOS (Eslovenia)

LIFE BIOPOL - Production of Leather making BioPolymers from biomasses and industrial by products, through Life Cycle Designed processes

**Fecha de inicio:** 01/07/2016

**Fecha de finalización:** 30/09/2019

**Coordinador:** Codyeco (Italia)

**Participantes:**

- Ilsa (Italia)
- Ca' Foscari University (Italia)
- Derivados del Colágeno (España)
- Industrias Peleteras (España)

**Fuentes:** <https://www.retema.es/noticia/nuevos-bio-productos-a-partir-de-residuos-organicos-gSSxe>, Fase de datos CORDIS y Life+

# PATENTES BIOENERGÍA

Biocombustibles sólidos (pellets, biochars, bio RDFs, bio SRFs, etc.)		
Nº Publicación	Solicitante (País)	Contenido técnico
EP3141590	Bocaiuva Mecanica Ltda (BR)	<b>Industrial process using a forced-exhaust metal furnace and mechanisms developed for simultaneously producing coal, fuel gas, pyroligneous extract and tar.</b> This patent of invention is related to a process and a furnace developed for production of charcoal with recovery of gases, tar and pyroligneous extract. The unity system is composed by a metallic furnace, a loading platform, a carbonization platform and unloading platform. For continuous generation of gases, the process operates with multiple carbonization platforms and one or more furnaces for carbonization platform. The furnace is provided with air inputs in strategic side points and mechanism for relieving pressure. The carbonization system is composed by an exhauster, special pipes for conducting the gases, and devices for the recovery of condensable. The gases generated in the process are directed to a burner, a gasifier or directly in a boiler to generate thermal and / or electrical energy. The technology presents, exclusively, a gravimetric yield in fuel gas superior to 60 % and a productivity on charcoal above 800 kg / h, so that each operating cycle of the furnace takes less than 5 hours. The coal is discharged hot, after carbonization and loaded on wooden billets immediately after unloading. The process combines technical, economic, operational, and environmentally viable solutions.
EP3464523	ERS Fuel Inc (CA)	<b>System and method for forming a solid fuel element.</b> A system for forming a woody biomass component and a binder component into a solid fuel element having a predetermined density. The system includes a first compression assembly for compressing an uncompressed mixture of the woody biomass component and the binder component to provide a first compressed mixture formed into a preliminary element having a preliminary density. The system also includes a second compression assembly for compressing the preliminary element to form the solid fuel element having the predetermined density, which is greater than the preliminary density.
EP3143331	Hallowell Jeffrey R (US)	<b>Biochar carbonizer.</b> The production of biochar generates syngas, VOCs, CO and other gasses that can adsorb to biochar and reduce the quality of the final product. A controller measures the operating parameters, such as temperature, pressure and oxygen level, and automatically controls a feedstock auger motor, blower(s) and other subsystems of a continuous combined heat, power and biochar carbonizer. The carbonizer pyrolyzes feedstock. A catalytic converter combusts unburned components in by-product gases and generates additional thermal energy. Thermal energy drives an engine, such as a Sterling, steam, or ORC engine, to generate electricity or operate a mechanical device. Remaining thermal energy is transferred using another medium, such as air or water, via a heat exchanger. The feedstock is purposefully incompletely combusted, to produce biochar that consists largely of carbon. The biochar may be used to augment soil for cultivation, filtration or for other purposes. Some embodiments condense water from the exhaust to provide potable water.
DK2813479	Heijmans Wegen BV (NL)	<b>Method for manufacturing of pellets comprising municipal waste incinerator bottom ash.</b> The invention relates to a method for manufacturing pellets from municipal waste incinerator bottom ash comprising separating a fraction with a particle size in the range from 0 to 6 mm from the municipal waste incinerator bottom ash, mixing the fraction with a binder, adjustment of moisture content by adding water to form a wet mix and pelletizing the wet mix. The invention also relates to concrete products comprising pellets formed by such method.
WO2019114385	Hunan Hengkai Environmental Prot Group (CN)	<b>Method for preparing biomass fuel using urban domestic sludge.</b> A method for preparing biomass fuel using urban domestic sludge, comprising: using a coulter blending machine to stir evenly urban domestic sludge, chaff, sawdust, pumice and microbial agent to obtain a mixed material; using a multi-layer vertical mixing and turnover fermentation tower to perform biodrying on the mixed material to obtain a biodried material; and mixing the biodried material with a combustion improver, prilling and drying same to obtain biomass fuel particles. The method is simple and is low in cost, and the prepared biomass fuel has the advantages of igniting quickly, a strong burning fire power and a long burning duration.

Nº Publicación	Solicitante (País)	Contenido técnico
US10309647	Kawasaki Heavy Ind Ltd (JP)	<b>Biomass combustion burner, biomass-mixed fired boiler, and biomass fuel combustion method.</b> The present invention provides a biomass combustion burner applied to a pulverized coal-fired boiler to burn biomass fuel, a biomass-mixed fired boiler that reduces an amount of CO2 derived from fossil fuels, and a method for burning biomass fuel using the foregoing. The biomass combustion burner includes a biomass fuel jet nozzle having a fuel jet port that jets biomass fuel conveyed by primary air; a secondary air nozzle having a secondary air jet port that surrounds the fuel jet port; and a tertiary air nozzle having a tertiary air jet port that surrounds the secondary air jet port. The biomass fuel jet nozzle includes a fuel concentration adjusting section that changes a biomass fuel stream into a swirl flow to thereby make a fuel concentration higher on an outer circumferential portion side; and a degree-of-swirl adjusting plate that reduces a degree of swirl of a jetting fuel stream.
EP2998650	Pellax Spolka Zoo Spolka Komandytowa (PL)	<b>Pellet burner with a rotary combustion chamber.</b> The subject of the invention is a cover of the combustion chamber in the pellets burner, having a housing with an inlet whole for pellets and rotary combustion chamber surrounded with a cylindrical cover, connected with the housing, in addition, a space between the combustion chamber and the cover is a ring-shaped duct supplying air into the combustion chamber circumferentially placed on it. The ring-shaped duct supplying air into the combustion chamber is closed in front of the cover with its flange ring directed towards inside of the chamber and a sealing ring operating together with it, connected permanently with the outer surface of the combustion chamber. According to the invention, a rear part of the cover is permanently connected with a compensatory plate, a surface of which is perpendicular to the longitudinal axis of the cover whereas, the compensatory plate is elastically connected with the burner housing.
WO2019125208	Prakina Irina Vladimirovna (RU)	<b>Fuel element for a solid fuel domestic boiler.</b> A fuel element for a solid fuel domestic boiler is intended for heating residential buildings. The element is in the form of a piece of wood produced by the substantially parallel sawing of a tree trunk having a diameter of 6-16 cm every 6-14 cm in a direction substantially perpendicular to the axis of the trunk. The end faces 1 are substantially perpendicular to the axis of the tree trunk and are clean cut. The surface area of the element is less than the surface area of a traditional log having an elongate shape and the same volume of wood. The arrangement of such elements in a boiler furnace allows a significant reduction in the total area of all of the elements. The burning rate of the fuel is lowered, the fuel burns completely, and the heat output is increased. The furnace is charged less frequently than when using traditional firewood, and rooms are heated more economically. The element has a low cost and is easy and cheap to produce without the need for expensive equipment. The element can be produced from timber obtained from sites felled for environmental purposes.
EP3410010	Swiss Krono Tec AG (CH)	<b>Burner for combustion of fuel in the form of a wood disintegration product, in particular fine material.</b> The invention relates to a burner for the combustion of material for combustion in the form of a comminuted wood product, in particular of fine material, having (a) a material-for-combustion feed for the feed of the material for combustion, (b) a screw conveyor for conveying the material for combustion, (c) a combustion region, wherein the screw conveyor is arranged to convey the material for combustion from the material-for-combustion feed to the combustion region, (d) an air feed for feeding air to the combustion region and (e) a burner mouth for discharging combustion gases out of the combustion region. According to the invention, a tamping region is provided which is formed, in the material flow direction (M) of the material for combustion, downstream of the material-for-combustion feed and upstream of the combustion region, wherein a conveying screw of the screw conveyor and the tamping region are designed for compressing the material for combustion in the tamping region.
WO2019069860	Ube Industries (JP)	<b>Device and method for manufacturing biomass solid fuel.</b> The present invention realizes a biomass solid fuel in which self-heat generation is suppressed. This device for manufacturing a biomass solid fuel is provided with a carbonizing furnace for carbonizing a biomass molded body and obtaining a biomass solid fuel, a yield calculation unit for calculating the yield of the biomass solid fuel, and/or a temperature measurement unit for measuring the temperature of the carbonizing furnace, and a control unit for controlling a heat source of the carbonizing furnace, the control unit controlling the heat source on the basis of a correlation between self-heat generation of the biomass solid fuel and the yield and/or the temperature of the carbonizing furnace.

## Syngas

Nº Publicación	Solicitante (País)	Contenido técnico
WO2019074431	Cortus AB (SE)	<p><b>Process and apparatus for hydrotreatment of pyrolysis oil.</b> An apparatus and process are disclosed for producing hydrocarbons from biomass, the apparatus comprising: a pyrolysis reactor in which dry biomass is heated in an environment substantially free from oxygen and halogens, wherein a pyrolysis product and char is produced; a gasification reactor in which the separated char is heated in an environment containing steam so as to reduce said char to produce a synthesis gas, a gas cooler in which the produced synthesis gas is cooled to a cooled synthesis gas; a conditioning and pressure system, in which the cooled synthesis gas is refined so as to produce a purified synthesis gas; a separation device, in which hydrogen gas is separated from the purified synthesis gas. The apparatus also comprises a hydrogenation device, into which pyrolysis oil retrieved from the pyrolysis product, and at least a portion of the separated hydrogen gas recuperated from the separation device are introduced for a hydrogenation step, in which the pyrolysis oil is hydrogenated by the presence of the hydrogen gas, wherein hydrocarbons that are substantially free from oxygen are produced.</p>
WO2019107564	Eco Prana Co Ltd (JP)	<p><b>Combustion apparatus and combustion method.</b> To provide a small size combustion apparatus which reduces the amount of harmful exhaust gas such as nitrogen oxides and realizes high-temperature combustion gasification with high efficiency in multiple stages, and a combustion method therefor. [Solution] The combustion apparatus according to the present invention is formed from a cylindrical member on the base side and a tapered member on the distal end side, and comprises, on the distal end side, a fuel charge section into which a gas-liquid mixed fuel is sprayed and charged, and comprises, on the base side, a flame discharge section, the combustion apparatus being characterized by comprising: a plurality of heat exchangers as described above which are arranged in parallel at a desired distance such that the axis of a tubular body extends from the distal end side to the base side; a plurality of combustion chambers formed in front of and behind the plurality of heat exchangers; an air pipe for introducing outside air into an arbitrary combustion chamber; and a return pipe for returning carbon dioxide generated by combustion, from at least one downstream combustion chamber to an upstream combustion chamber, among the plurality of combustion chambers.</p>
WO2019099002	Gas Tech Institute (US)	<p><b>Processes and systems for reforming of methane and light hydrocarbons to liquid hydrocarbon fuels.</b> Processes for converting methane and/or other hydrocarbons to synthesis gas (i.e., a gaseous mixture comprising H<sub>2</sub> and CO) are disclosed, in which at least a portion of the hydrocarbon(s) is reacted with CO<sub>2</sub>. At least a second portion of the methane may be reacted with H<sub>2</sub>O (steam), thereby improving overall thermodynamics of the process, in terms of reducing endothermicity (<math>\Delta H</math>) and the required energy input, compared to "pure" dry reforming in which no H<sub>2</sub>O is present. Such dry reforming (reaction with CO<sub>2</sub> only) or CO<sub>2</sub>-steam reforming (reaction with both CO<sub>2</sub> and steam) processes are advantageously integrated with Fischer-Tropsch synthesis to yield liquid hydrocarbon fuels. Further integration may involve the use of a downstream finishing stage involving hydroisomerization to remove FT wax. Yet other integration options involve the use of combined CO<sub>2</sub>-steam reforming and FT synthesis stages (optionally with finishing) for producing liquid fuels from gas streams generated in a number of possible processes, including the hydrolysis of biomass.</p>
WO2019065851	Japan Blue Energy Co Ltd (JP)	<p><b>Biomass gasification device.</b> The present invention provides a biomass gasification device that optimizes the pyrolysis temperature of biomass, the reforming temperature of pyrolysis gas, and the atmosphere thereof to generate a reformed gas containing a large amount of valuable gas, that can prevent clogging and corrosion of piping caused by diphosphorus pentoxide and potassium in ash, and suppress the generation of N<sub>2</sub>O, and that can also reduce the occurrence of tar and soot. The present invention related to a biomass gasification device that is provided with a biomass pyrolyzer, a pyrolysis gas reformer, and a pyrolysis gas introduction pipe, wherein: the biomass pyrolyzer is further provided with a heat carrier inlet and outlet ports, and performs pyrolysis on the biomass by heat of the heat carrier; the pyrolysis gas reformer performs steam-reforming on pyrolysis gas generated by the pyrolysis of biomass; the pyrolysis gas reformer is further provided with an air or oxygen blow-in port; and the pyrolysis gas introduction pipe is provided on the biomass pyrolyzer-side surface below the upper surface of the heat carrier layer formed in the biomass pyrolyzer.</p>

Nº Publicación	Solicitante (País)	Contenido técnico
WO2019093949	Kiram AB (SE)	<b>Thermochemical conversion of biomass.</b> The present invention is directed to a process for the production of a syngas suited for further conversion to fine chemicals and/or automotive fuels from biomass by a thermochemical process conducted in a several steps procedure, said process comprising; a) Providing a stream of biomass material; b) Providing an aqueous alkaline catalyst stream comprising sodium and/or potassium compounds; c) Mixing comminuted biomass and alkaline catalyst and optional additives to form an alkaline biomass slurry or suspension; d) Treating alkaline biomass slurry or suspension in a hydrothermal treatment reactor at a temperature in the range of 200-400°C and a pressure from 10-500 bar, forming a bio- oil suspension comprising liquefied biomass and spent alkali catalyst; e) Directly or indirectly charging the bio-oil suspension from step d), after optional depressurization to a pressure in the range 10-100 bar, heat exchange and separation of gases, such as CO <sub>2</sub> , steam and aqueous spent catalyst into a gasification reactor operating in the temperature range of 600 - 1250°C thereby forming a syngas and alkali compounds; and f) Separating alkali compounds from a gasification reactor or from syngas and recycling alkali compounds directly or indirectly to be present to treat new biomass in the hydrothermal biomass treatment reactor of step d) and/or recycling aqueous alkali salts to a pulp mill chemicals recovery cycle.
WO2019076389	Latent Energie Gbr (DE)	<b>Method and device for the gasification of biomass.</b> The invention relates to a method and device for the catalytic gasification of biomass to form biochar and a combustible gas primarily containing CO, CO <sub>2</sub> , water vapour, hydrogen, methane and ammonia under the exclusion of air. The biomass is mixed in a synthesis gas reactor with a catalyst on the counter-current principle, and the biomass is guided on a walking floor grate in counter-current to a catalyst likewise supported on a walking floor grate arranged above the walking floor grate of the biomass, and the catalyst is distributed over the biomass through the walking floor grate and is brought into contact with the synthesis gas from the synthesis circuit, created from the catalytic gasification of the biomass and heated in a superheater, by recirculating at least some of the synthesis gas.
WO2019107797	Res Inst Ind Science & Tech (KR)	<b>Method for producing high-calorific synthetic natural gas and apparatus for producing same.</b> The present invention relates to a method and apparatus for producing high-calorific synthetic natural gas by using syngas (CO and H <sub>2</sub> mix gas) obtained through gasification of coal, biomass, or the like or generated from byproduct gas in the petrochemical industry or the like. According to the present invention, synthetic natural gas having a caloric value of 10,200 kcal/Nm <sup>3</sup> (± 200 kcal/Nm <sup>3</sup> ) can be effectively produced.
NL2018906	Stichting Energieonderzoek Centrum Nederland (NL)	<b>Removal of monocyclic aromatic compounds (BTX) from a gas.</b> The present invention relates to an improved process and system for purifying a gas, preferably an energy gas, containing aromatic compounds and isolating a fraction of aromatic compounds from said gas. In the process according to the invention, the gas is contacted with a washing liquid in step (a), at a temperature of 15 — 250 °C, to obtain a purified gas, which is depleted in aromatic compounds, and a spent washing liquid wherein the aromatic compounds are dissolved. The spent washing liquid is stripped in step (b) with a stripping gas comprising at least 50 vol.% steam, to obtain a stripped washing liquid which is advantageously reused in step (a) and a loaded stripping gas comprising the aromatic compounds. The aromatic compounds are separated from the loaded stripping gas in step (c) by condensation of the steam and/or the aromatic compounds comprised in the loaded stripping gas to obtain an immiscible composition and isolating the aromatic compounds therefrom. The cleared stripping gas which is advantageously reused in step (b).
EP3492558	Univ Tongji (CN)	<b>Method and system for preparing fuel gas by utilizing organic waste with high water content.</b> The present invention provides a method and system for preparing fuel gas by utilizing an organic waste with high water content. The method comprises the following steps: 1) providing an organic waste with high water content; 2) performing hydrothermal reaction by using the organic waste with high water content as a reactant to obtain a hydrothermal reaction product; 3) enabling the hydrothermal reaction product to generate steam, and separating a solid product and an oily liquid product in the hydrothermal reaction product; 4) performing gasification reaction by using the solid product, the oily liquid product and the steam as reactants to obtain a gasification reaction product; and 5) purifying the gasification reaction product to obtain clean fuel gas. The present invention further provides a system for preparing fuel gas. The method can be used for preparing clean fuel gas from the organic waste with water content of 60% or more.

Nº Publicación	Solicitante (País)	Contenido técnico
WO2019057930	Wurth Paul SA (LU)	<b>Method for producing hot synthesis gas, in particular for use in blast furnace operation.</b> The invention relates to a method for producing a synthesis gas, in particular for use as reducing gas in a blast furnace, the method comprising: providing a fuel gas, the fuel gas being a hydrocarbon containing gas; providing an industrial gas, the industrial gas being a CO <sub>2</sub> and/or H <sub>2</sub> O containing gas; mixing the fuel gas and the industrial gas to form a gas mixture; carrying out heating and reforming of the gas mixture within a heat accumulator, such as e.g. a blast furnace stove or a pebble heater, to produce a hot synthesis gas at a temperature above 700°C and below 1700°C. The invention further relates to a method for operating a blast furnace, the method comprising producing such a synthesis gas and feeding it as reducing gas into the blast furnace.

## Biogás

Nº Publicación	Solicitante (País)	Contenido técnico
US2019169517	Air Liquide Advanced Tech Llc (US)	<b>Integrated PTSA/membrane method and system for H<sub>2</sub>S and CO<sub>2</sub> removal from biogas.</b> Biogas containing H <sub>2</sub> S and CO <sub>2</sub> is upgraded by removing H <sub>2</sub> S using PTSA and CO <sub>2</sub> using two stages of gas separation membranes. The first stage permeate may optionally be used a regeneration gas stream. The second stage permeate may optionally be used a cool down gas stream. The PTSA unit includes two or more adsorbent beds each selective for water, VOCs, and H <sub>2</sub> S over CO <sub>2</sub> and for H <sub>2</sub> S over methane.
WO2019102074	Avefori OY (FI)	<b>Reactor for manufacturing biogas from organic raw material using anaerobic digestion.</b> The invention relates to a reactor for manufacturing biogas from organic raw material using anaerobic digestion, the reactor including a tubular reaction chamber with a substantially rectangular cross-section composed of a bottom, walls and a ceiling for processing raw material into end products, and agitation and transfer equipment arranged in the reaction chamber and an external support frame structure arranged on the outer surface included in the reaction chamber for stiffening and supporting the reaction chamber externally against forces generated by the raw material.
WO2019095028	ERBR Energias Renovaveis Ltda (BR)	<b>Unit for refining biogas and supplying biomethane.</b> The invention relates to an integrated set of equipment and a process for treating and refining highly contaminated biogas for the purpose of producing biomethane and to the supply thereof in small volumes of up to 10 m <sup>3</sup> /h to vehicles, such that the refining unit produces small quantities of biomethane per day to supply motor vehicles operating on the same premises as those where the biogas is produced, such as rural properties and small effluent-treatment stations. The unit for refining biogas and supplying biomethane, referred to herein as a "biomethane microstation", is an innovative technological concept wherein the microstation comprises the generation of the fuel and the distribution thereof for consumption on the same premises, using a compact biogas refining unit.
EP3473724	FCC Aqualia SA (ES)	<b>Method for obtaining methane enriched biogas and an installation for carrying out said method.</b> The invention relates to a method for obtaining methane-enriched biogas for an anaerobic digester that operates at a self-generated pressure, which is greater than the atmospheric pressure, comprising feeding the digester with organic matter for carrying out anaerobic digestion, extracting an enriched biogas stream through a valve; and which further comprises the steps of extracting and recirculating organic matter that is being treated in the digester through a recirculation pipe and a pumping device, introducing a recirculation stream which contains organic matter in an external liquid gas mixing system and injecting a hydrogen stream, and subsequently injecting a liquid stream of hydrogen-saturated organic matter and microbubbles in a gaseous phase into the digester.
RU2688356	Federalnoe Gosudarstvennoe Byudzhetnoe Obrazovatelnoe Uchrezhdenie Vysshego Obrazovaniya Altajskij G (RU)	<b>Biogas plant for processing of organic wastes into biogas and biofertilizers.</b> Proposed is a biogas plant for processing organic wastes into biogas and biofertilizers. Proposed plant comprises bioreactor, biogas outlet branch pipe, circulating pump, receiving tank for biomass and shell-and-tube heat exchanger. Bioreactor is equipped with a water jacket and a turbine mixer. Shell-and-tube heat exchanger is connected to the bioreactor by the biomass loading pipeline, and the circulation pump is connected to the bioreactor by the substrate unloading pipeline, the receiving biomass capacity by pipelines is connected through a circulation pump to the shell-and-tube heat exchanger. EFFECT: invention provides activation of methanogenic fermentation in the entire volume of the loaded substrate at constant temperature and with mixing of the entire volume of the substrate.

Nº Publicación	Solicitante (País)	Contenido técnico
WO2019099953	Hansen Jaron C et al. (US)	<b>Microbial pretreatment for conversion of biomass into biogas.</b> A system for degrading biomass with anaerobic digestion that includes a biological pretreatment with organisms that break down lignocellulosic materials before anaerobic digestion or for use as feedstock for other reactions.
WO2019099060	Hwang Herng Shinn (US)	<b>Catalytic biogas combined heat and power generator.</b> A distributed Biogas Combined Heat and Power Generator can provide automatically hot water and electricity. Since biogas is produced from human, animal, kitchen and agriculture's wastes, it is a short term recycled product from the photosynthesis of CO <sub>2</sub> , and has a net zero carbon emission. The sulfur compounds in the biogas can be removed by the following steps: converting all sulfur compounds into H <sub>2</sub> S by the hydrogen produced from the biogas over Pt group metal catalysts; adsorbing the H <sub>2</sub> S at high temperature by the regenerate Pt group metal catalyst and adsorbents. The desulfurized biogas is further converted by an ATR/CPO reformer or a steam generating reformer to produce various reformates, which can be connected to a downstream IC engine/gas turbine, and/or a steam turbine to drive electric generators for generating electricity. The hot reformat and the exhaust gases can be cooled in heat exchangers to produce hot-water/hot-air.
WO2019086649	Niederbacher Michael (IT)	<b>Plug flow fermenter of a biogas plant.</b> The invention relates to a plug flow fermenter of a biogas plant, comprising a reactor container, in the reactor interior of which a substrate that is to be fermented, preferably by dry fermentation, can be fermented in the form of a plug flow with production of biogas. The reactor container has a container inlet, via which the substrate to be fermented can be fed to the reactor interior, and a container outlet distanced from the container inlet in the plug flow direction, via which container outlet the fermented substrate can be discharged from the reactor interior. According to the invention the fermenter has a central storage space in the form of a cavity, which, as considered in the circumferential direction, is surrounded at least in regions by the reactor container, which is ring-like or ring portion-like, such that the plug flow flows, starting from the container inlet, in the form of an annular flow in the direction of the container outlet.
WO2019091521	Schoubye Peter Carl Sehestedt (DK)	<b>Process for purification of biogas without removing CO<sub>2</sub> or CH<sub>4</sub> from the gas.</b> A Process for removal of up to 99,9% of H <sub>2</sub> S and other S-compounds and up to 99% of siloxanes in biogas and other gases comprising CO <sub>2</sub> and CH <sub>4</sub> , based on selective absorption in an absorption tower of SO <sub>2</sub> or H <sub>2</sub> S in concentrated sulfuric acid comprising peroxy disulfuric acid (H <sub>2</sub> S <sub>2</sub> O <sub>8</sub> ) and peroxy sulfuric acid (H <sub>2</sub> SO <sub>5</sub> ) oxidizing H <sub>2</sub> S and SO <sub>2</sub> to H <sub>2</sub> SO <sub>4</sub> comprising the consecutive steps of : (1) compressing the gas to 3 pressure above 3 bar, typically 5-40 bar, and condensing its content of H <sub>2</sub> O typically at 30 - 40 °C (2) heating the gas to typically 200-250 °C and oxidizing its content of S-compounds selectively to SO <sub>2</sub> by a catalyst comprising oxides of V and Ti with a small excess of O <sub>2</sub> added to the gas in step (1), (3) cooling and condensing H <sub>2</sub> O at 0 -50 °C, typically at 20 - 40 °C (4) oxidizing the SO <sub>2</sub> and H <sub>2</sub> S in the biogas to H <sub>2</sub> SO <sub>4</sub> by contacting the gas at about 100 °C in an absorption tower with recirculating hot concentrated sulfuric acid comprising H <sub>2</sub> S <sub>2</sub> O <sub>8</sub> generated preferably by electrolysis of H <sub>2</sub> SO <sub>4</sub> in an electrolyzer inserted in said recirculation of concentrated sulfuric acid. The formation of the H <sub>2</sub> S <sub>2</sub> O <sub>8</sub> in the electrolyzer also ensures maintenance of high concentration of the circulating acid as H <sub>2</sub> O is consumed in the over-all process. Siloxanes in the gas are absorbed and dissolved in the concentrated sulfuric acid while CH <sub>4</sub> , CO <sub>2</sub> and O <sub>2</sub> in the gas pass unaffected through the sorption tower. In a potentially much more advantageous but not so well validated simplified version of the Process, seen in fig 1 and 3, the gas is passed directly from step (1) to step (4) for direct oxidation of H <sub>2</sub> S to H <sub>2</sub> SO <sub>4</sub> in the sorption tower. The effluent gas from the sorption tower can be passed to applications such as combustion in gas turbines or engines, or to further steps of ultra purification upstream of catalytic reduction with H <sub>2</sub> of the CO <sub>2</sub> in the gas to CH <sub>4</sub> , methanol or higher hydrocarbons. The Process consumes only biogas and electricity and produces no byproducts apart from condensed water, a stream of useful concentrated sulfuric acid equivalent to the amount of sulfur in the biogas and a stream of useful H <sub>2</sub> from the electrolysis of H <sub>2</sub> SO <sub>4</sub> . The digester should be operated with highest possible content of H <sub>2</sub> S, 1-2 % or more, in the gas passed to the process of the invention.
ES2714370	Tirsi SRL (IT)	<b>Process for the production of biogas from a solid digestate.</b> The invention relates to a process that allows the production of biogas by fermentation of a solid digestate obtained as a waste product of biogas production plants using products with a high content of cellulosic fibers as raw material, with savings of ingestate. The invention further relates to selected bacteria species of Clostridium thermocellum, and their use in the process of biogas production from cellulosic fiber-rich materials.

## Bioalcoholes (bioetanol, biometanol, etc.)

Nº Publicación	Solicitante (País)	Contenido técnico
US2019127765	Danisco US Inc (JP)	<b>Altered host cell pathway for improved ethanol production.</b> A recombinant yeast cell, fermentation compositions, and methods of use thereof are provided. The recombinant yeast cell includes at least one heterologous nucleic acid encoding one or more polypeptide having phosphoketolase activity; phosphotransacetylase activity; and/or acetylating acetaldehyde dehydrogenase activity, wherein the cell does not include a heterologous modified xylose reductase gene, and wherein the cell is capable of increased biochemical end product production in a fermentation process when compared to a parent yeast cell.
US2019177747	Honda Motor Co Ltd (JP)	<b>Novel microalga having aggregation ability.</b> In ethyl alcohol production using the self-fermentation of a microalga, a step of concentrating or collecting an algal body by centrifugal treatment, filtering treatment or the like is made unnecessary or simple to save labor for effort and equipment therefor is saved. The microalga belongs to Chlamydomonas sp., and is a variant strain which has an ability to produce ethyl alcohol under dark and anaerobic conditions and has acquired an ability to proliferate while aggregating. The microalga is proliferated and maintained under dark and anaerobic conditions to generate ethyl alcohol in this method for producing ethyl alcohol.
US2019136138	IFP Energies Now (FR)	<b>Process for producing BTX and alcohols by catalytic pyrolysis of biomass and fermentation of the gaseous pyrolysis effluent.</b> A process is described for producing BTX and alcohols from biomass, by a) catalytic pyrolysis of the biomass in a fluidized-bed reactor producing a gaseous pyrolysis effluent; b) separation of said gaseous pyrolysis effluent into at least one BTX fraction and a gaseous effluent containing at least carbon monoxide and carbon dioxide, c) sending all of the gaseous effluent from separation b) into fermentation producing a liquid fermentation stream containing at least one stream containing at least one oxygenated compound chosen from alcohols, diols, acid alcohols, carboxylic acids, aldehydes, ketones and esters, d) separating the fermentation stream obtained on conclusion of c) into at least the stream containing at least one oxygenated compound, an aqueous fraction, and an unreacted gaseous effluent, e) recycling at least part of unreacted gaseous effluent into the catalytic pyrolysis a).
WO2019083244	Industry Academic Cooperation Foundation Keimyung Univ (KR)	<b>Method for pretreatment and saccharification of biomass for production of biofuels or bioplastics.</b> The present invention relates to a method for pretreatment and saccharification of biomass for production of biofuels or bioplastics. According to the present invention, the incubation treatment of biomass with novel fibrinolytic mold fungus KPYBE10 before physical and chemical pretreatment can produce a saccharification liquid having the same glucose concentration despite the use of a low sulfuric acid concentration, a low temperature, a short time, and a small amount of a diastatic enzyme. In addition, physical and chemical conditions of the present invention reduce the generation of fermentation inhibiting substances, such as furfural and hydromethylfurfural, thereby providing an incidental effect that a decontamination process is unnecessary. The pretreatment method using acid hydrolysis of the present invention can drastically reduce pretreatment and saccharification costs and high-pressure steam and electricity costs, which account for 53%, more than half of the conventional second-generation bioethanol direct production costs. A low-cost saccharification liquid prepared by the above method can be used as a microorganism medium for industrial fermentation for the production of second-generation biofuels and bioplastics, and therefore the method is a novel, cheap and environmentally friendly method capable of rapidly realizing commercial-scale production.
WO2019124143	Kawasaki Heavy Ind Ltd (JP)	<b>Method for enzymatically producing bioethanol using cellulosic biomass as starting material.</b> The present invention addresses the problem of providing a method for producing bioethanol using a lignocellulosic biomass as a starting material, wherein the ethanol concentration of a fermented liquid obtained in a fermentation step can be increased and the distillation load can be reduced without requiring any special equipment in solubilizing cellulose contained in the biomass by enzymatic hydrolysis. When hemicellulose is removed from a cellulosic biomass and the resultant solid residue is mixed with an aqueous solution containing a cellulose hydrolytic enzyme in a reaction container, the concentration of ethanol is controlled to 3-6 mass% inclusive. Thus, the growth of miscellaneous microorganisms can be prevented during the hydrolysis of the cellulose and the ethanol concentration can be increased when a saccharified solution is subjected to ethanol fermentation. As a result, the distillation load is reduced. The ethanol added at the hydrolysis can be recovered in the step for distilling the alcohol fermented liquid and then reused.

Nº Publicación	Solicitante (País)	Contenido técnico
US2019161773	Reed Tavis (US)	<b>Bacteria based cellulosic ethanol fermentation process.</b> A process for the creation of ethanol from cellulosic materials using the bacteria Cellulomonas sp. and aerobic Zymomonas mobilis in the same medium under the same conditions to breakdown cellulosic materials into glucose and to ferment that glucose into ethanol and three significant byproducts, glycerol, acetic acid, and lactic acid.
US2019153482	The State of Israel Ministry of Agricult & Rural Dev Agricult Res Organizat (IL)	<b>Lactic acid bacteria for the production of ethanol from biomass material.</b> Lactic acid bacterial cultures, cell populations and articles of manufacture comprising same are disclosed for generating ethanol from lignocellulose.
WO2019060988	Ultra Clean Ecolene Inc (CA)	<b>Bio-methanol production.</b> Methods and systems for producing bio-methanol can include anaerobic digestion of a biomass feedstock to produce biogas including methane and carbon dioxide, partial oxidation of the biogas with oxygen from water electrolysis to produce syngas, synthesizing bio-methanol from the syngas and hydrogen from the water electrolysis, storing the bio-methanol, intermittently using battery based electricity to power the electrolysis during peak electricity demand, and intermittently using renewable electricity from another source during off-peak demand. Electricity can also optionally be obtained by periodically combusting a portion of the bio-methanol. The techniques provide a route for the production of bio-methanol without the engagement of fossil fuels as feedstocks and mitigating fossil fuel derived greenhouse gas emissions from processing and utilization of transportation fuels and commercial or industrial alcohols.
WO2019087031	Versalis Spa (IT)	<b>Process for the production of sugars from biomass derived from guayule plants.</b> Process for the production of sugars from biomass derived from guayule plants comprising: subjecting said biomass to a biological pretreatment in the presence of at least one lignolytic fungus obtaining a liquid phase comprising sugars and a first solid residue; subjecting said first solid residue to hydrolysis in the presence of at least one diluted inorganic acid obtaining a first hydrolysate comprising sugars and a second solid residue; subjecting said second solid residue to enzymatic hydrolysis obtaining a second hydrolysate comprising sugars and a third solid residue. The sugars thus obtained can be advantageously used as sources of carbon in fermentation processes for producing alcohols (e.g., ethanol, butanol), lipids, diols (e.g., 1,3-propanediol, 1,3-butanediol, 1,4-butanediol, 2,3-butanediol), or in chemical synthesis processes for producing other intermediates or chemical products (e.g., furfural). Said alcohols and lipids can be advantageously used in turn in the production of biofuels (e.g., biodiesel or "green diesel"), which can be used as such, or mixed with other fuels for transportation, while said diols can be used in the production of products such as bio- butadiene which can in turn be used for manufacturing rubbers (e.g., polybutadiene or copolymers thereof). Said uses are particularly important in the case of a biorefinery.
US2019161774	Xyleco Inc (US)	<b>Processing materials.</b> Biomass feedstocks (e.g., plant biomass, animal biomass, and municipal waste biomass) are processed to produce useful products, such as fuels. For example, systems are described that can convert feedstock materials to a sugar solution, which can then be fermented to produce ethanol. Biomass feedstock is saccharified in a vessel by operation of a jet mixer, the vessel also containing a liquid medium and a saccharifying agent.

## Biodiésel

Nº Publicación	Solicitante (País)	Contenido técnico
US10323197	Argent Energy UK Ltd (GB)	<b>Process for producing biodiesel and related products.</b> There is described a process for producing biodiesel and related products from mixtures. There is also described a process for producing precursors and feedstock materials for producing biodiesel and related products. The processes use esterification and trans-esterification, separation and purification. Other process steps such as acidification and distillation can also be used.
EP2362892	Exxonmobil Res & Eng Co (US)	<b>Hydroprocessing of biodiesel fuels and blends.</b> A method for producing diesel fuel from biocomponent feeds includes hydrotreating the feed followed by catalytic dewaxing with a ZSM-48 containing catalyst. The hydrotreated feed may be cascaded directly to the dewaxing step, or the hydrotreated feed can undergo intermediate separation. The diesel fuel resulting from processing of the biocomponent feed exhibits superior cetane values.

Nº Publicación	Solicitante (País)	Contenido técnico
WO2019098556	Kim Kyung Hwa (KR)	<b>Apparatus and method for production of biodiesel.</b> The present invention relates to an apparatus and a method for production of biodiesel by using oils and fats in waste cooking oils. The apparatus comprises: an oil and fat reservoir for storing oils and fats; a catalytic processing unit to which the oils and fats stored in the oil and fat reservoir are fed and in which the oils and fats are pressurized and aerated under the condition that a catalyst has been provided thereto; and an alcohol reaction unit to which the oils and fats transferred from the catalytic processing unit are fed and in which the oils and fats are pressurized and aerated under the condition that an alcohol has been provided thereto, wherein the pressurization and aeration in the catalytic processing unit and the alcohol reaction unit are conducted using a high-rate oxidation reactor.
US2019153488	Massachusetts Inst Technology (US)	<b>Integrated biological conversion of gaseous substrate into lipids.</b> A bioconversion scheme is provided that effectively converts syngas, generated from gasification of coal, natural gas or biomass, into lipids that can be used for biodiesel production.
WO2019077313	Petrobras (BR)	<b>Process for producing esters and biolubricants, catalysed by fermented solid.</b> The present invention relates to a process for producing esters comprising reaction of methyl biodiesel or free fatty acids with a polyhydroxylated alcohol, in the presence of a biocatalyst, which is a fermented solid containing lipases of <i>Rhizomucor miehei</i> produced by culturing the microorganism on agricultural waste by solid state fermentation.
CA2852350	Phillips 66 Co (US)	<b>Synthesis of diesel fuel blendstock from carbohydrates.</b> Carbohydrates as derived from plant biomass can be converted into mono- alcohols, diols, and/or bi-functional alcohols or into carboxylic acid derivatives. By catalytic transesterification of such carbohydrate derivatives, ester-type diesel-fuel blendstock components may be produced. More specifically, alkyl levulinates are catalytically trans-esterified with hydroxyl-functionalized compounds where both the alcohols and the alkyl levulinates are derived from biomass carbohydrates. Esters produced in this way show physicochemical characteristics that make them suitable for use as diesel fuel blendstock.
EP3473696	Tangshan Jinlihai Biodiesel Corporation Ltd (CN)	<b>Device and method for producing ultra-low sulfur biodiesel.</b> Provided is a device for producing ultra-low sulfur biodiesel. The device for producing ultra-low sulfur biodiesel is a two-stage processing device, comprising a two-stage purification unit, a two-stage enzyme reaction unit, a two-stage distillation unit, and a decompression rectification unit. The present invention is green and environment-friendly, effectively and completely removing sulfur-containing impurities from the raw material, eliminating the attack of a sulfur-containing group in the synthesis process on fatty acids, and providing sufficient conditions for obtaining ultra-low sulfur content methyl esters in the product section.
US10280389	Trans Biodiesel Ltd (IL)	<b>Enzymatic transesterification/esterification processes employing lipases immobilized on hydrophobic resins in the presence of water solutions.</b> Disclosed are processing systems and processes for carrying out enzymatic batchwise or continuous process for the production of fatty acid alkyl esters for use in the biofuels, food and detergent industries.
US2019144369	Univ Southern California (US)	<b>Conversion of corn oil to upgraded biodiesel and poly(lactic acid).</b> Conversion of vegetable-derived triglycerides to fatty acid methyl esters (FAMES) is a popular approach to the generation of biodiesel fuels and the basis of a growing industry. Drawbacks of the strategy are that (a) the glycerol backbone of the triglyceride is discarded as waste in this synthesis, and (2) many natural triglycerides are multiply-unsaturated or fully saturated, giving inferior performance and causing engine problems with long-term use. Here, we show that catalysis by iridium complex 1 can address both of these problems through selective reduction of triglycerides high in polyunsaturated fatty esters to FAMES with high oleate concentration. This is realized using hydrogen imbedded in the triglyceride backbone, concurrently generating lactate as a value-added C3 product. Additional methanol or glycerol as a hydrogen source enables reduction of corn and soybean oils to >80% oleate.

Nº Publicación	Solicitante (País)	Contenido técnico
US10246644	Univ Tsinghua (CN)	<b>Method for preparing biodiesel.</b> The present invention provides a method for preparing biodiesel, comprising: adding oil and fat, short-chain alcohol, water, and liquid lipase into a single-stage or multi-stage enzyme reactor; then separating the reaction fluid into an enzyme-containing heavy phase and a light phase; recovering and reusing the enzyme in the heavy phase; using the light phase for subsequent conversion by immobilized lipase; flowing the light phase and the short-chain alcohol into single-stage or multi-stage enzyme reactor containing an immobilized lipase; performing online dehydration during the whole reaction process or part of the reaction process. In the method of the invention for preparing biodiesel, no preprocessing is required for the oil and fat feedstock in the earlier stage of catalysis process by liquid lipase, and the conversion ratio from oil and fat to biodiesel can reach more than 90%; in the later stage of catalysis process by immobilized lipase, by introducing an online dehydration during the whole process or part of the reaction process, the yield of biodiesel can exceed 98%, and the acid value of the product can be less than 0.5 mg KOH per gram of oil. The method thus has good economic and environmental benefits.

Bio-jet fuels		
Nº Publicación	Solicitante (País)	Contenido técnico
US2019136142	Advanced Biomass R&D Center (KR)	<b>Hydrocracking catalyst based on hierarchically porous beta zeolite and method of preparing the same and method of preparing bio-jet fuel from triglyceride-containing biomass using the same.</b> The present invention relates to a hydrocracking catalyst based on hierarchically porous beta-zeolite, a method of preparing the same, and a method of producing bio-jet fuel from triglyceride-containing biomass by use of the hydrocracking catalyst, and includes methods comprising preparing a hydrocracking catalyst by supporting a metallic active component on a hierarchically porous beta-zeolite support, and converting n-paraffins, produced from triglyceride-containing biomass, into bio-jet fuel by hydrocracking in the presence of the prepared hydrocracking catalyst. When the hydrocracking catalyst based on hierarchically porous beta-zeolite is used, the residence time of the reactant and the product in the zeolite crystals may be reduced due to additional mesopores formed in the zeolite, and thus bio-jet fuel may be produced in high yield from n-paraffin feedstock produced from triglyceride-containing biomass.
EP3473609	Expander Energy Inc (CA)	<b>Enhancement of Fischer-Tropsch process for hydrocarbon fuel formulation in a GTL environment.</b> An enhanced Fischer-Tropsch process for the synthesis of sulfur free, clean burning, green hydrocarbon fuels, examples of which include syndiesel and aviation fuel. Naphtha is destroyed in a hydrogen generator and recycled as feedstock to a syngas (FT) reactor in order to enhance the production of syndiesel from the reactor. A further variation integrates a second hydrogen generator capturing light hydrocarbon gas for conversion to hydrogen and carbon monoxide which supplements the Fischer-Tropsch reactor. The result is a considerable increase in the volume of syndiesel formulated. A system for effecting the process is also characterized in the specification.
US2019144891	Kiverdi Inc (US)	<b>Microorganisms for biosynthesis of limonene on gaseous substrates.</b> Engineered microorganisms are provided that convert gaseous substrates, such as producer gas, into limonene. In some embodiments, limonene is pumped out of the cell via an efflux pump. In some embodiments, limonene, produced as described herein, is converted through catalytic dimerization into jet fuel. Producer gas used in the processes described herein for production of limonene may be derived from sources that include gasification of waste feedstock and/or biomass residue, waste gas from industrial processes, or natural gas, biogas, or landfill gas.
WO2019078057	Showa Shell Sekiyu (JP)	<b>Aviation biofuel base material, aviation biofuel including same, and method for manufacturing aviation biofuel.</b> The present invention relates to a biojet fuel substrate comprising biomass-derived isoparaffin comprising hemicellulose or cellulose, a biojet fuel comprising the substrate, and a method of producing a biojet fuel.

Nº Publicación	Solicitante (País)	Contenido técnico
US10273415	Sundrop Fuel Inc (US)	<b>Flexible options for utilizing naphtha from a low temperature Fischer-Tropsch process in a plant converting biomass to syncrude or transportation fuels.</b> A bio-reforming reactor receives biomass to generate chemical grade syngas for a coupled downstream train of a low-temperature Fischer-Tropsch reactor train that uses this syngas derived from the biomass in the bio-reforming reactor. A renewable carbon content of the produced gasoline, jet fuel, and/or diesel derived from the coupled downstream train the low-temperature Fischer-Tropsch reactor train are optimized for recovery of renewable carbon content to produce fuel products with 100% biogenic carbon content and/or fuel products with 50-100% biogenic carbon content. The low-temperature Fischer-Tropsch reactor train produces syncrude, transportation fuels such as bio-gasoline or bio-diesel, or a combination thereof.
US10253336	US Navy (US)	<b>High density fuels based on longifolene.</b> A process for making high density fuels having the potential to increase the range and/or loiter time of Navy platforms. Derivation of these fuels from a sustainable source will decrease the carbon footprint of the Department of Defense (DoD) and reduce reliance on nonsustainable petroleum sources. Fuels based on longifolene have volumetric net heats of combustion up to 17% higher than conventional Navy jet fuel (JP-5). Moreover, longifolene can be generated from sustainable biomass sugars via fermentation.
US10323198	US Navy (US)	<b>High density renewable fuels from zizaenes.</b> A process for making high density fuels having the potential to increase the range and/or loiter time of Navy platforms. Derivation of these fuels from a sustainable source will decrease the carbon footprint of the Department of Defense (DoD) and reduce reliance on nonsustainable petroleum sources. Fuels based on ziza-anes have volumetric net heats of combustion up to ca. 18% higher than conventional Navy jet fuel (JP-5). Moreover, ziza-anes can be generated from sustainable biomass sugars via fermentation.
US2019161777	Woods Hole Oceanographic Inst (US)	<b>Use of marine algae for co-producing alkenones, alkenone derivatives, and co-products.</b> A method comprising a series of selective extraction techniques for the parallel production of biodiesel and isolation of several valuable co-products including an alkenone hydrocarbon mixture of the kerosene/jet fuel range (primarily C10-, C12-, and C17-hydrocarbons) and fucoxanthin, a high-valued carotenoid, from the marine alkenone-producing microalgae Isochrysis.
US10246658	Reg Synthetic Fuels Llc (US)	<b>Biorenewable kerosene, jet fuel, jet fuel blendstock, and method of manufacturing.</b> The present technology provides compositions that include at least about 98 weight percent (wt. %) n-paraffins which, among other surprising features, may be suitable for use as a diesel fuel, an aviation fuel, a jet fuel blendstock, a blendstock to reduce the cloud point of a diesel fuel, a fuel for portable heaters, and/or as a charcoal lighter fluid. The composition includes at least 98 wt. % C7-C12 n-paraffins, where at least 10 wt. % of composition includes n-decane, at least 20 wt. % of the composition includes n-dodecane, and at least 75 wt. % of the composition includes even carbon number paraffins. The composition also includes less than 0.1 wt. % oxygenates and less than 0.1 wt. % aromatics. The composition may be produced by a process that includes hydrotreating a biorenewable feedstock comprising at least one of palm kernel oil, coconut oil, babassu oil, microbial oil, or algal oil.
WO2019084518	Xyleco Inc (US)	<b>Processing biomass.</b> Techniques for processing biomass are disclosed herein. A method of preparing cellulosic ethanol having 100% biogenic carbon content as determined by ASTM 6866-18, includes treating ground corn cobs with electron beam radiation and saccharifying the irradiated ground corn cob to produce sugars. The method also includes fermenting the sugars with a microorganism. In addition, a cellulosic biomass-derived jet fuel comprising about 25% of aromatic hydrocarbons, about 2.5% of alkenes, about 41% of alkanes, and about 8.5% of oxygenated compounds (wt./wt.) is disclosed.

## Otros biocombustibles (bio-hidrógeno, bio-oils, biopropano, etc.)

Nº Publicación	Solicitante (País)	Contenido técnico
WO2019078713	Avecom N V (BE)	<b>Method and system for the enhancement of productivity of hydrogenotrophic micro-organisms.</b> The invention relates to a method and system for the enhancement of productivity of hydrogenotrophic micro-organisms. The method comprises the steps of: providing a reactor comprising a reactor vessel, at least one gas inlet and/or hydrogen production system, at least one fluid inlet, and at least one fluid outlet; charging the reactor with a hydrogenotrophic micro-organism culture; providing a gas feed to the at least one gas inlet with the gas feed comprising an amount of hydrogen gas and/or producing hydrogen gas with the hydrogen production system; providing a fluid feed to the at least one fluid inlet; growing biomass; and removing and/or taking up of hydrogen (H <sub>2</sub> ), carbon dioxide (CO <sub>2</sub> ) and/or NH <sub>3</sub> /NH <sub>4</sub> <sup>+</sup> . Preferably, the method further comprises the steps of: charging the reactor with at least one phototrophic micro-organism culture, and in-situ forming of oxygen (O <sub>2</sub> ) by the phototrophic micro-organisms.
US10260004	Beijing Huashi United Energy Tech and Development Co Ltd (CN)	<b>Method for direct liquefaction of biomass.</b> The present invention discloses a method for direct liquefaction of biomass. The method comprises the following steps: (1) mixing a biomass, a hydrogenation catalyst and a hydrogen-donor solvent to prepare a biomass slurry; (2) carrying out a first liquefaction reaction with the biomass slurry and hydrogen gas to obtain a first reaction product; (3) carrying out a second liquefaction reaction with the first reaction product and hydrogen gas to obtain a second reaction product; (4) subjecting the second reaction product to a first gas-liquid separation at a temperature of 290-460 DEG C. to produce a first liquid phase and a first gas phase; (5) subjecting the first gas phase to a second gas-liquid separation at a temperature of 30-60 DEG C. to obtain a second liquid phase, and mixing the first liquid phase with the second liquid phase to obtain a liquid phase mixture; (6) carrying out a first distillation on the liquid phase mixture to obtain a light fraction and a heavy fraction; and (7) carrying out a second distillation on the heavy fraction to separate out a distillate oil and a residue, wherein the light fraction and the distillate oil are final liquid of the liquefaction. By utilizing the method for direct liquefaction of biomass, the obtained final liquid has a high yield and a low solid content of residue.
US2019100780	Corbion Biotech Inc (US)	<b>Tailored oils produced from recombinant oleaginous microorganisms.</b> Methods and compositions for the production of oil, fuels, oleochemicals, and other compounds in recombinant microorganisms are provided, including oil-bearing microorganisms and methods of low cost cultivation of such microorganisms. Microalgal cells containing exogenous genes encoding, for example, a lipase, a sucrose transporter, a sucrose invertase, a fructokinase, a polysaccharide-degrading enzyme, a keto acyl-ACP synthase enzyme, a fatty acyl-ACP thioesterase, a fatty acyl-CoA/aldehyde reductase, a fatty acyl-CoA reductase, a fatty aldehyde reductase, a fatty acid hydroxylase, a desaturase enzyme, a fatty aldehyde decarbonylase, and/or an acyl carrier protein are useful in manufacturing transportation fuels such as renewable diesel, biodiesel, and renewable jet fuel, as well as oleochemicals such as functional fluids, surfactants, soaps and lubricants.
WO2019100145	Envirolella Inc (CA)	<b>Process for producing liquid fuel from waste hydrocarbon and/or organic material, reactor, apparatus, uses and managing system thereof.</b> There are provided processes for producing liquid fuels from a mainly organic starting material with a reduced content in water and/or with a reduced content in solids. The mainly organic starting material can be at least partially liquified and optionally further dewatered. The obtained at least partially liquid fraction can be thereafter used as feeding stream that is submitted to a pyrolysis treatment resulting in a solid gas fraction allowing the recovering of a liquid fuels after a controlled liquid solid separation treatment. There are also provided various other processes for producing liquid fuel from waste hydrocarbon and/or organic material as well as reactors, apparatuses, uses and managing systems thereof.
EP3164356	Gas Technology Inst (US)	<b>Hydropyrolysis of biomass-containing feedstocks.</b> Various techniques are disclosed for pretreating municipal solid waste (MSW) and other biomass-containing feedstocks that may be of a poorer quality and consequently more difficult, or even impossible, to convert to higher value liquid products (e.g., transportation fuels) using conventional processes. Such conventional processes may otherwise be satisfactory for the conversion of the biomass portion of the feedstock alone. The pretreatment of biomass-containing feedstocks may generally include steps carried out prior to a hydropyrolysis step and optionally further steps, in order to change one or more characteristics of the feedstock, rendering it more easily upgradable.

Nº Publicación	Solicitante (País)	Contenido técnico
US10323259	Indian Oil Corp Ltd (IN)	<b>Formulation and process for biohydrogen production.</b> The present invention relates to a process for enhancing hydrogen production in an anaerobic fermentative hydrogen production process. The present invention also provides a production media, more specifically, a sugar production media for use in an anaerobic fermentative hydrogen production process to enhance hydrogen production. The present invention also provides a novel strain <i>Clostridium</i> sp., MTCC 25082 for use in an anaerobic fermentative hydrogen production process for enhancing hydrogen production.
EP2636641	Technical Inst of Physics And Chemistry of the CAS (CN)	<b>Preparation of a semiconductor photocatalyst for the photocatalytic reforming of biomass derivatives for hydrogen generation.</b> Disclosed are a semiconductor photocatalyst for the photocatalytic reforming of biomass derivatives for hydrogen generation, and preparation and use thereof. The semiconductor photocatalyst has the atomic composition ratio of M-N-A <sub>x</sub> ; wherein M-N are IIB group elements to VIA group elements, or IIIA group elements to VA group elements, A being one element or more than two elements selected from the group consisting of cobalt, nickel, iron, copper, chromium, palladium, platinum, ruthenium, rhodium, iridium and silver; and 0.02% ≤ x ≤ 1.0%. The method of in-situ preparation of the highly effective semiconductor photocatalyst and catalytically reforming biomass derivatives for hydrogen generation by driving photoreaction with visible light via quantum dots is simple, fast, highly effective, inexpensive and practical. The in situ reaction can occur in sunlight without the need of harsh conditions such as calcination.
WO2019084657	The Saskatchewan Res Council (CA)	<b>Process for the production of hydrocarbon biofuels.</b> A method of deoxygenating a feedstock, comprising at least one oxygenated organic compound, to form a hydrocarbon product, comprising the steps of: contacting the feedstock with a catalyst under conditions to promote deoxygenation of the at least one oxygenated compound, wherein the catalyst comprises a mixed metal oxide of the empirical formula: (M <sub>2</sub> ) <sub>y</sub> (M <sub>1</sub> ) <sub>1-y</sub> O-ZnO-(Al <sub>2</sub> O <sub>3</sub> ) <sub>x</sub> is disclosed. The invention is useful in the production of renewable fuels, such as renewable diesel, and jet fuel.
EP3186359	Univ Strasbourg (FR)	<b>Method for producing hydrogen by means of dark fermentation from biomass from the wine-producing industry, without using a microbial consortium.</b> The invention relates to a method for producing hydrogen by means of dark fermentation from biomass from the wine-producing industry, without adding a microbial consortium and without thermal pre-treatment.
WO2019067366	Valero Services Inc (US)	<b>Production of renewable fuels and intermediates.</b> The present disclosure relates to methods for the production of transportation fuels from renewable plant- and animal-based resources. The methods disclosed herein present an environmentally-friendly process for using or recycling plant- and animal-based fats and oils. The renewable feed stocks can be used to produce a variety of hydrocarbon fuels, including renewable gasoline. The disclosure also relates to fuel products and fuel blend stocks produced from renewable hydrocarbon starting materials.

# PATENTES BIOPRODUCTOS

Biomateriales (de construcción, medicina, embalaje, etc.)		
Biocomposites y biofibras		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2019093898	Bambooder Biobased Fiber BV (NL)	<b>Method and device for producing a ribbon and a thread of bamboo fiber.</b> The present invention relates to a method of producing a ribbon comprising bamboo fibers, the method comprising: positioning the fibers on a conveyor and conveying the fibers in a transport direction, interconnecting the fibers by: covering the fibers with thread and/or particles of a sticky material with at least one web forming device which is positioned above and/or below the conveyor and which ejects thread and/or particles, wherein the formed thread and/or particles attaches to the fibers and forms a web which interconnects the fibers in order to form the ribbon, and/or stitching the fibres together with at least one stitching device which is configured to stitch the individual fibers together in order to form the ribbon.
WO2019078775	Cellutech AB (SE)	<b>Biocomposite material comprising CNF and an anionic gelling polysaccharide.</b> A composite material comprising 65-99wt% cellulose nanofibers and 0.5-30 wt% of an anionic gelling polysaccharide, as calculated by dry weight of the composite material, a method for preparing such composite material, and different applications and uses of the composite material.
WO2019092250	Creapaper GmbH (DE)	<b>Method and device for treating grass fibres.</b> The invention relates to a method for treating grass fibres, comprising the steps of: providing natural grass fibres from fresh grass, mechanically crushing the grass fibres in order to release proteins from the grass into the water contained in the grass, and mechanically removing the grass fibres from said protein-containing water.
EP3478492	Galle Rudy et al. (BE)	<b>A composite board made from recycled and recyclable materials.</b> The present invention is directed to a composite board at least partially made of a nonwoven composite material, said nonwoven composite material comprising: - unravelled natural fibers and/or glass fibers, - plastic fibers, and - between 10 and 75% weight of liquid based thermoharder. Further, the present invention is also directed to the use of such composite board in all applications wherein Particle Board (PB), Medium and High Density Fibreboard (MDF & HDF), Oriented Strand Board (OSB), Laminated Veneer Lumber (LVL), Plywood (PLW) and related materials are used, and in wall panels, separation panels, insulation panels, laminates, flooring, in particular laminate flooring, tiles, furniture, and related applications. In addition, the present invention is directed to a process for manufacturing a composite board comprising mixing unravelled natural fibers and/or glass fibers with plastic fibers thereby forming a fiber layer, and thermoforming said fiber layer into a nonwoven composite material layer, wherein said thermoforming comprising impregnating the fiber layer under vacuum conditions with liquid thermoharder and heating.
EP3461870	Holt Lloyd International Ltd (GB)	<b>Automotive engine cooling system stop-leak formulation.</b> The present invention relates to an automotive engine cooling system stop-leak formulation for repairing leaks in an engine cooling system, is compatible with common coolant antifreeze types and is capable of maintaining the repair after draining and re-filling the coolant. The automotive engine cooling system stop-leak formulation comprising a polymeric resin and a particulate package, wherein the particulate package comprises a first natural fibre having a first fibre length and a greater amount of a second natural fibre having a second fibre length.
EP3137679	Kemira Oyj (FI)	<b>Method for producing a suspension of microfibrillated cellulose, microfibrillated cellulose and its use.</b> The invention relates a method for producing a suspension of microfibrillated cellulose. The method comprises at least the steps of obtaining an aqueous suspension of natural cellulose fibres, adding an additive consisting of at least one natural polymer to the suspension of natural cellulose fibres, and feeding the obtained mixture comprising natural cellulose fibres and the additive into a homogenizer or a fluidizer. The invention relates also to a microfibrillated cellulose obtained by the method and its use.

Nº Publicación	Solicitante (País)	Contenido técnico
WO2019068003	Panelshake Corp (US)	<b>Natural fiber composite construction materials.</b> Natural fiber composite construction materials including boards, siding, railroad ties, standing seam roofing panels, roofing panels that support solar-electric modules, and roofing panels that support vegetation are provided. In various embodiments, composite construction materials comprise about 50-60% kenaf fiber.
EP3495427	Sasol Wax GmbH et al. (DE)	<b>Wood plastic composite composition comprising a wax, method for producing a wood plastic composite therefrom and the use of waxes as lubricants for the production of wood plastic composites.</b> The invention relates to wood plastic composite compositions comprising a wax, wherein the composition has superior properties in the processing thereof. The wax is characterized by its dynamic viscosity at 120° C, congealing point, content of molecules in which the carbon chain is linear and content of oxidized hydrocarbons.
WO2019092278	Stichting Wageningen Res et al. (NL)	<b>Lignin-Based Bio-Asphalt.</b> The present invention relates to a composition comprising bitumen; optionally vegetable oil or derivative thereof; and a lignin preparation, wherein the lignin preparation is characterized by a lignin purity of 60-100 wt.% with respect to the weight of the lignin preparation; and a lignin average molecular weight of 1000-5000 g/mol. The composition may be an asphalt binder composition or asphalt composition. Accordingly, the present invention also relates to a paving or roofing comprising the composition of the invention. Further, the present invention relates to a method of preparing an asphalt composition, comprising mixing bitumen with filler material, adding lignin preparation and vegetable oil to the mixture obtained, preferably wherein the lignin preparation and the vegetable oil are added simultaneously.
EP3368615	Valspar Sourcing Inc (US)	<b>Composition and methods for wood concrete board.</b> A wood fiber composite with improved adhesion is made using the method described herein. The uncoated substrate is coated with a pretreatment, followed by coating of a sealer and a topcoat over the pretreatment. Preheating the substrate prior to pretreatment appears to increase adhesion.

### Bioplásticos

Nº Publicación	Solicitante (País)	Contenido técnico
WO2019074876	Board of Supervisors of Louisiana State Univ and Agricultural and Mechanical College (US)	<b>Algae-based bioplastics and methods of making.</b> Provided for are methods of producing triacylglycerol-accumulated microalgae, methods for making bioplastics from triacylglycerol-accumulated microalgae, methods for making alga-mixed plastics, and products including these bioplastics. Methods of triacylglycerol accumulation using centrifugation are also provided. Products such as plastic beads and other consumer products can be made from the bioplastics described herein.
US2019194388	Coca Cola Co (US)	<b>Bio-based polyethylene terephthalate packaging and method of making thereof.</b> This invention relates to a method of making a bio-based PET packaging and particularly to a method of producing a bio-based PET from at least one bio-based material comprising: a) forming at least one PET component from at least one bio-based material, wherein the at least one PET component is selected from a monoethylene glycol ("MEG"), a terephthalic acid ("TA"), and combinations thereof; b) processing said bio-based PET component into a bio-based PET.
WO2017168398	Dandelion Res Ltd (CN)	<b>Polylactic acid moulding process.</b> Novel polylactic acid biopolymer systems and methods of producing products with polylactic acid biopolymers are disclosed. Products produced according to the systems and methods disclosed herein have enhanced deflection temperature and improved mechanical performance when compared to conventional injection moulding processes. Systems and methods for compounding polylactic acid biopolymer and creating an object using a polylactic acid biopolymer by extrusion and injection moulding process are described.
EP3467176	Fuence Co Ltd (JP)	<b>Nanofiber structure constituted of polyhydroxyalkanoic acid, and non-woven fabric.</b> The biodegradability of a nanofiber film (a nanofiber structure) produced in example 1 by microorganisms or the like when the nanofiber film is allowed to leave in soil is examined. Fig. 4 (a) shows a photograph of the nanofiber film immediately after the nanofiber film is placed in soil. Fig. 4(b) shows a photograph of the nanofiber film (a) that is allowed to leave as it for 12 days. As is obvious from the comparison between these photographs, a polyhydroxyalkanoic acid nanofiber film can be degraded in soil remarkably rapidly. Therefore, PHA can be produced from a plant-derived resource occurring in nature, can be degraded by microorganisms in soil to return to nature, and can be used as a resource material which can overcome the disadvantages of the conventional PP non-woven fabrics (e.g., the generation of CO <sub>2</sub> upon incineration) and which can be used permanently, thereby enabling the production of a novel non-woven fabric.

Nº Publicación	Solicitante (País)	Contenido técnico
WO2019119157	Genecis Bioindustries Inc (CA)	<b>Method for producing polyhydroxyalkanoates (PHA) from organic waste.</b> A method and apparatus are provided for producing polyhydroxyalkanoate (PHA) from organic waste, comprising homogenizing organic waste with a homogenizer to obtain a feedstock that has 1 : 1 to 3 : 1 (w/w) water to organic waste ratio, inoculating the feedstock with acidogenic fermentative bacteria in a VFA fermentation tank to obtain an inoculated feedstock, which is incubated for 5 to 10 days to obtain a fermentation broth. The fermentation broth, which comprises volatile fatty acids (VFAs) and undigested organic waste, is filtered using a filter system having a pore size ranging from 0.2 µm to 500,000 NMWC to remove the acidogenic fermentative bacteria and undigested organic waste, to produce a clarified broth comprising concentrated VFAs. The clarified broth and an inoculum of high-PHA producing bacteria are incubated in a PHA fermentation tank to produce intracellular PHA granules in said bacteria, and PHA polymers are extracted.
US10283233	IBM (US)	<b>Bio-based conformal coating for sulfur sequestration using polyhydroxyalkanoates.</b> Embodiments described herein provide methods of processing an electronic component, comprising mixing a bio-based polymer having sulfur-reactive substituents with a sulfurization catalyst and a solvent to form a coating material; applying the coating material to an electronic component; and removing the solvent to form a sulfur-reactive polymer coating that is resistant to sulfur penetration. The bio-based polymer may be made by bacterial fermentation of unsaturated fatty acids.
WO2019071052	Lanzatech Inc (US)	<b>Production of polyhydroxybutyrate in wood-ljungdahl microorganisms.</b> The invention provides microorganisms and methods for the production of polyhydroxybutyrate (PHB) from gaseous substrates. In particular, the invention provides a non-naturally occurring Wood-Ljungdahl microorganism comprising (a) an enzyme that converts acetyl-CoA to acetoacetyl-CoA, (b) an enzyme that converts acetoacetyl-CoA to 3-hydroxybutyryl-CoA, and (c) an enzyme that converts 3-hydroxybutyryl-CoA to polyhydroxybutyrate, and methods related thereto.
EP3491063	PTT Public Company Ltd (TH)	<b>A bioplastic composition comprising biomass as a component and a production process.</b> This invention discloses a bioplastic composition comprising biomass as a component comprising a plastic compound resin comprising polybutylene succinate (PBS), polylactic acid (PLA), and additives selected from biomass from the coffee roasting processes, i.e. silver skin of coffee (SSC); and/or at least one fluoropolymer or fluoropolymer derivative as a friction reducing agent. This invention also relates to a process of pretreating the silver skin coffee for using as an additive for bioplastic resin to produce various products or using as a natural color masterbatch together with other plastics via extrusion, injection molding, compression and thermoforming processes in the industrial level.
EP3481909	Repsol SA (ES)	<b>Compositions of polyhydroxyalkanoates and polar polymers.</b> The present invention is directed to a polymer composition comprising a medium chain length polyhydroxyalkanoate (mcl-PHA) and a polar polymer (e.g. co-polymers of ethylene and vinyl acetate). The invention further includes adhesives based on the composition and manufacturing methods thereof.
EP3448649	SPC Sunflower Plastic Compound GmbH (DE)	<b>Process for producing a bioplastics product.</b> A process for producing a biomaterial product based on sunflower seed hulls/sunflower seed husks comprising providing or producing a sunflower plastic compound (SPC) compounded material (SPC PBS, SPC PBSA), wherein the material is obtained by compounding a sunflower seed hull material/sunflower seed husk material with a biodegradable plastic, for example polybutylene succinate (PBS), polybutylene succinate-adipate (PBSA), or the like. The SPC compounded material is preferably used for producing an injection molded product, for example biodegradable containers, packagings, films or the like, in particular coffee capsules, tea capsules, urns, cups, plant pots, flowerpots, or the like.
US10323144	US Agriculture et al. (US)	<b>Biodegradable cardstock composition.</b> L-Polylactic acid and D-Polylactic acid biodegradable biopolymers are combined with torrefied biomass and a plasticizer to create a biodegradable cardstock composition. The biodegradable cardstock composition provides an alternative to conventional plastic cardstocks, which are manufactured using petroleum-based materials such polyvinyl chloride (PVC) or polystyrene (PS). The biodegradable cardstock described herein can be incorporated into a variety of end products such as key cards, driver licenses, security badges, calling cards, and other plastic cards, including those that have a magnetic strip containing stored data such as credit and debit cards.

## Bioproductos químicos (biofertilizantes, biocosméticos, biofarmacéuticos...)

### Biofertilizantes y biocosméticos

Nº Publicación	Solicitante (País)	Contenido técnico
EP3454822	Bio-on SpA (IT)	<b>Composition comprising a polyester of biological origin and a biocompatible inorganic compound, and use thereof in the cosmetic field.</b> Composition comprising at least one polyhydroxy-alkanoate (PHA) and at least one calcium phosphate, said at least one calcium phosphate being in the form of aggregates having an average size ranging from 0.1 µm to 10 µm, preferably from 0.2 µm to 5 µm, and preparation processes thereof. Said composition can be used in particular in formulations for cosmetic use, wherein it can act not only as a biodegradable polymeric component which lasts for a long time on the surface of the keratins of skin and hair even after prolonged rinses, but also as an innovative carrier and dispenser of specific active ingredients, whose bioactivity is prolonged after each application.
EP3474954	Biotechmarine et al. (FR)	<b>Method for obtaining a diglycoside-enriched armeria maritima extract, and use thereof in cosmetics.</b> Disclosed are a method for preparing a hydroalcoholic extract obtained from a biomass of the shoots of a plant from the family of Plumbaginaceae, a butanol extract of <i>Armeria maritima</i> , a method for the preparation thereof, the use thereof, and compositions containing same.
CA2964711	Chevron USA Inc (US) et al.	<b>Synthesis of diester-based lubricants from enzymatically-directed epoxides.</b> The present invention is generally directed to methods of making diester-based lubricant compositions, wherein formation of diester species proceeds via esterification of epoxide intermediates, and wherein the epoxide intermediates are generated via an enzymatically-driven mechanism. In some embodiments, the methods for making such diester-based lubricants utilize a biomass precursor and/or low value (e.g., Fischer-Tropsch (FT) olefins and/or alcohols) so as to produce high value diester-based lubricants. In some embodiments, such diester-based lubricants are derived from FT olefins and fatty acids. The fatty acids can be from a bio-based source (i.e., biomass, renewable source) or can be derived from FT alcohols via oxidation.
WO2019118986	Cool Planet Energy Systems Inc (US)	<b>Biochars and biochar extracts having soluble signaling compounds and method for capturing material extracted from biochar.</b> A method for capturing material extracted from biochar is provided comprising the steps of: (i) providing a biochar; (ii) contacting the biochar with an extraction media, where the extraction media causes the removal of residual compounds from the pores and surface of the biochar, creating a resulting extract comprised of the extraction media and removed compounds; and (iii) collecting the resulting extract. The method also can include other steps of extraction and purification. The method further comprises the step of applying the resulting extract to seeds, plants, soil, other agricultural products, or for use in other applications. A biochar having high levels of soluble signaling compounds is also provided, where the biochar is derived from a biomass source that together with predefined pyrolysis parameters produces resulting biochar having increased levels of soluble signaling compounds that are known to increase seed germination rates and early plant growth.
EP2674411	Fertinagro Biotech SL (ES)	<b>Method for obtaining a biological fertilizer from apatite minerals by means of microorganisms and biological fertilizer thus obtained.</b> The present invention relates to a method for obtaining a biological fertilizer, as well as to the biological fertilizer obtained by means of said method. The method allows obtaining a biological fertilizer with phosphorus from the apatite mineral by means of using a mixture of degradable mineral raw materials, a protein concentrate, posidonia, fresh manure, magnesium sulfate and ferrous sulfate as degradable mineral raw materials which are a source of nitrogen, energy and minerals for the phosphate-solubilizing organisms, as well as the phosphate-solubilizing organisms themselves as a seed inoculant, with a high efficiency, on aluminum-calcium phosphate, preferably on the aluminum-calcium rock.
WO2019123468	Fine Organics Ind Ltd (IN)	<b>Applications of an ester additive from bioderived raw materials.</b> An ester additive prepared from diol and dicarboxylic acid or fatty acid wherein the diol and dicarboxylic acid or fatty acid are bioderived and the ester is used as a slip and/or antiblocking agent and/or lubricant in moulded synthetic articles from polyvinylchloride, styrenics, thermoplastic elastomers, polyolefins and engineering plastics; in cosmetic compositions; in nutraceutical compositions and as food emulsifiers.

Nº Publicación	Solicitante (País)	Contenido técnico
EP3237349	Rockwool Int A/S (DK)	<b>Improved biobinder.</b> Described is an aqueous binder composition for mineral fibres comprising a component (i) in the form of one or more compounds selected from - compounds of the formula, and any salts thereof: in which R1 corresponds to H, alkyl, monohydroxyalkyl, dihydroxyalkyl, polyhydroxyalkyl, alkylene, alkoxy, amine; - compounds of the formula, and any salts thereof: in which R2 corresponds to H, alkyl, monohydroxyalkyl, dihydroxyalkyl, polyhydroxyalkyl, alkylene, alkoxy, amine; a component (ii) in the form of one or more compounds selected from the group of ammonia, amines or any salts thereof; a component (iii) in the form of one or more carbohydrates; a component (iv) in the form of one or more compounds selected from sulfamic acid, derivatives of sulfamic acid or any salt thereof.
EP2510150	Stichting Wageningen Res (NL)	<b>Novel method for processing lignocellulose containing material.</b> The invention is related to a method for processing biomass derived from plants or animals, comprising the steps of: a. pre treating said material with an aqueous solution of acid or base; b. subsequently passing saturated or super heated steam through said material. With such a process it is possible to disintegrate or make more accessible for subsequent treatments the lignocellulose from lignocellulose containing materials, like wood or other plant material, chitin from exoskeletons from Crustacea like crabs and shrimps, and proteins such as keratin from pig hair or chicken feather for production of chemicals, e.g. as sugars from carbohydrates for fermentation processes such as the production of (bio-) ethanol or as keratine hydrolysates for applications in paper or cosmetics.
EP3368087	Tech Innovation Momentum Fund Israel Limited Partnership (IL)	<b>Composite bioadhesive sealant.</b> A kit and a bioadhesive, comprising gelatin, alginate, montmorillonite and a coupling agent, which is characterized by rapid curing, optimal viscosity, high burst strength, flexibility, biocompatibility and biodegradability, is disclosed.
EP3461901	Technische Univ Muenchen (DE)	<b>A process for the cell-free enzymatic production of 10-hydroxystearic acid (10-HSA) from bio-based oils for lubricant formulation.</b> The present invention relates to an enzymatic process for the modification of free fatty acids (FFAs) derived from renewable feedstocks of bio-based oils. Specifically, the invention describes the hydrolysis of any bio-based oil, such as high oleic sunflower oil (HOSO), to FFAs, containing high amounts of oleic acid (OA), which is further hydrated to 10-hydroxystearic acid (10-HSA).

### Biofarmaceúticos

Nº Publicación	Solicitante (País)	Contenido técnico
WO2019123015	Aker Biomarine Antarctic AS (NO)	<b>Lysophosphatidylcholine compositions.</b> The present invention provides marine lysophosphatidylcholine compositions for use in pharmaceuticals, nutraceuticals and functional foods, as well as methods for making marine lysophosphatidylcholine compositions.
US2019117723	Bionap Srl (IT)	<b>Compositions based on plant extracts for inhibition of the 5-alpha reductase.</b> The present invention refers to nutraceutical, cosmetic or pharmaceutical compositions based on a combination of vegetal extracts from flowers or fruits of <i>Opuntia ficus</i> and <i>Oryza sativa</i> (Black rice) for inhibition of the 5-alpha reductase. In particular, the preparations according to the invention are useful in prevention or treatment of benign prostatic hypertrophy or hyperplasia, of androgenic alopecia and acne.
WO2019125127	Centro de Retina Medica y Quirurgica SC (MX)	<b>Oral administration formulation of blueberry extract as a coadjuvant for preserving the health of human precorneal film.</b> The invention relates to a nutraceutical formulation of blueberry extract, fish oil (omega-3 and omega-6), recombinant human lactoferrin, vitamin A and vitamin E, for human oral consumption. The invention belongs to the field of ophthalmology and has been developed as a coadjuvant for preserving the health of the precorneal film and of the eye surface. This formulation contains an extract of natural origin ( <i>Vaccinium myrtillus</i> L) with antioxidant and anti-inflammatory properties; it also uses eicosapentaenoic acid (EPA), omega-6, and docosahexaenoic acid (DHA), omega-3, obtained from fish oil and which, together with lactoferrin, vitamin A and vitamin E, improves tear quality, since these compounds have anti-microbial and anti-inflammatory effects. This formulation has been designed as a coadjuvant for preserving the health of the precorneal film. No formulation for oral administration of a blueberry extract together with lactoferrin, in combination with vitamin A, vitamin E and fish oil (eicosapentaenoic acid and docosahexaenoic acid) is found in the prior art, nor is the use of this formulation as an adjuvant for preserving the health of the precorneal film and/or the eye surface.

Nº Publicación	Solicitante (País)	Contenido técnico
ES2717454	Expanscience Lab (FR)	<b>Utilización de por lo menos un co-producto de la industria del refinado de aceites vegetales para obtener un insaponificable total purificado de aceite vegetal.</b> The invention relates to the use of at least one coproduct of the vegetable-oil refining industry for obtaining a purified total unsaponifiable vegetable oil product which is free of the impurities initially found in said coproduct, and which is advantageously free of sapid and odorant compounds and/or of chemical compounds resulting from the breakdown and decomposition of vegetable oils. The invention also relates to a method for obtaining a purified total unsaponifiable vegetable oil product from at least one coproduct from the vegetal-oil refining industry. The invention also relates to a purified total unsaponifiable vegetable oil product that can be obtained by said method, and to compositions containing such an unsaponifiable product. The invention further relates to such unsaponifiable products or such compositions for the use thereof as a drug, medical device, dermatological agent, cosmetic agent, or nutraceutical agent for humans or animals.
WO2018068016	Found Biosystems Llc (US)	<b>Micro-and nano-quantity sleep enhancing nutrient composition and method of enhancing central nervous system protein clearance using same.</b> The present invention relates to a dietary supplement, composition, nutraceutical, and/or system for inducing or treating biological responses or conditions (namely sleep or sleep disorders) which utilize ultra-low dosage amounts of vitamins, minerals, amino acids, co-enzymes, stimulants, and/or similar ingredients in a highly bio-active delivery system which bypasses first pass metabolism. In particular, the present invention relates to a nutraceutical composition/formulation which substantially bypasses first pass metabolism and such as, but not limited to, activation of the glymphatic system to facilitate clearance of neuronal metabolites from the CSF and interstitial fluids in the brain.
US2019151770	Green Extraction Tech (US)	<b>Process for fractionation and extraction of herbal plant material to isolate extractives for pharmaceuticals and nutraceuticals.</b> A process for fractionating a plant material to provide isolated extractives, the process includes pretreating the plant material to provide a fluidized plant material, subjecting the pretreated fluidized plant material to high frequency pulses and shear forces without denaturing bioactive aspects of one or more components of the plant material to provide a first liquid fraction having extractives to be isolated and a first fractionated plant material, separating the first liquid fraction having extractives from the first fractionated plant material, and isolating extractives from the first liquid fraction.
US2019175680	Nanosmart Fruit Llc (US)	<b>Compositions comprising nanoparticles derived from whole fruit.</b> Nanoparticles may be derived from whole fruit. The nanoparticles may have a particles size less than about 1000 nanometers. The compositions may be used in nutraceutical products, dietary supplements, added to food or drinks, and combinations thereof.
WO2019090359	Nitto Denko Corp et al. (JP)	<b>Fusogenic compounds for delivery of biologically active molecules.</b> This invention includes fusogenic compounds, and compositions and methods of use thereof. The fusogenic compounds can be used for making nanoparticle compositions for use in biopharmaceuticals and therapeutics. More particularly, this invention relates to compounds, compositions and methods for providing nanoparticles to incorporate or encapsulate active agents, to deliver and distribute the active agents to cells, tissues, organs, and subjects.
WO2019068824	Plant Advanced Tech Pat (FR)	<b>Root extracts from plants of the morus genus and uses of same.</b> The present invention concerns a root extract from plants of the Morus genus (in particular Morus alba, Morus nigra) that is rich in prenylated polyphenols chosen from: moracenin A, moracenin B, kuwanon C, wittiorumin F and mulberrofuran T, a method for preparing such an extract and a cosmetic composition and a pharmaceutical or nutraceutical composition, said compositions comprising, as the active ingredient, at least one root extract from plants of the Morus genus according to the invention.
US2019151350	Suzhou Yi Hua Biomedical Tech Co Ltd et al. (CN)	<b>Depolymerized holothurian glycosaminoglycan composition and preparation method and application thereof.</b> The present invention discloses a depolymerized holothurian glycosaminoglycan composition and a preparation method and application thereof. The composition comprises one or more of depolymerized holothurian glycosaminoglycans with weight-average molecular weight between 2000 Da and 12000 Da. The preparation method of the depolymerized holothurian glycosaminoglycan composition comprises the steps of extracting and purifying holothurian glycosaminoglycan, depolymerizing the holothurian glycosaminoglycan and the like. Anti-tumor studies show that the depolymerized holothurian glycosaminoglycan composition can remarkably inhibit tube formation of human umbilical vein endothelial cells in vitro and inhibit metastasis of melanomas and breast cancer in vivo. With its excellent anti-cancer properties, depolymerized holothurian glycosaminoglycan composition can be used as pharmaceuticals, nutraceuticals and other health products.

Nº Publicación	Solicitante (País)	Contenido técnico
WO2019101042	Zhejiang Doer Biologics Corp (CN)	<b>Multi-domain active protein for treating metabolic diseases.</b> The present invention belongs to the field of biopharmaceuticals, and in particular relates to a multi-domain active protein for treating metabolic diseases. The multi-domain active protein has a structural formula as shown in Formula I: A-La-F-Lb-B; the multi-domain active protein of the present invention has a long half-life and supports a once-a-week administration frequency compared with the prior art; the GLP-1R agonist activity of the multi-domain active protein is increased up to over 200 times; the multi-domain active protein has good stability in vitro and in vivo, and has low immunogenicity. As the introduction of a non-natural amino acid is not required and chemical synthesis and crosslinking steps are not involved, the multi-domain active protein can be prepared by means of a recombinant method; therefore, the preparation process is greatly simplified.

Bioaditivos alimentarios		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2019088834	Cooperatie Avebe U A (NL)	<b>Potato protein based fibrous structures and food items comprising the same.</b> The invention relates to the manufacture of food and food ingredients, more in particular to plant -based fibrous structures for use in vegan products such as meat analogs. Provided is a method for the manufacture of an edible protein- based fibrous structure, comprising contacting an aqueous solution of a non- denatured potato protein with a carboxy methyl cellulose (CMC) having a Mw of at least 150,000 Dalton (Da) to yield a fiber forming solution, which fiber forming solution has a total dry matter (TDM) content in the range of 0.5 to 15%, and wherein said contacting is performed in the pH range of 2 to 5 and while mixing thereby inducing the formation of a potato protein-based edible fibrous structure.
WO2019089656	Corn Products Dev Inc (US)	<b>Starch blends and uses thereof.</b> A starch blend includes 40-85% (w/w) of an unmodified amylose-containing starch and 15-60% (w/w) of a non-chemically inhibited starch. The starch blend, upon cooking in water has a high viscosity after one or more, two or more, three or more, four or more, or five or more freeze-thaw cycles. Such starch blend is useful in a variety of food and beverage compositions, particularly frozen sauces and gravies.
WO2019107619	Jein Co Ltd (KR)	<b>Method for manufacturing jelly with Dendropanax morbifera extract added thereto.</b> The present invention relates to a method for manufacturing jelly with a Dendropanax morbifera extract added thereto, and provides a manufacturing method comprising a step for preparing a Dendropanax morbifera extract and a step for manufacturing jelly with a Dendropanax morbifera extract added thereto. The jelly manufacturing method of the present invention uses a Dendropanax morbifera extract and agar as main raw materials, so that the manufactured jelly shows functionality through functional ingredients of Dendropanax morbifera to induce consumers to buy products, and thus can be favorably used.
WO2019068590	Nestec SL (CH)	<b>Natural creamer with high tolerance to acidity and minerals in beverage.</b> Natural Creamers for providing whitening and indulgent texture/mouthfeel of beverage and food products are provided. The creamers have long-term stability, high whitening capacity and a pleasant mouthfeel when added to beverage and food, while being free from artificial additives the creamers comprising plant oil and plant proteins, and being further characterized in that the creamers comprise baking soda and citrus fruit juice concentrate, wherein the citrus fruit juice concentrate comprises acid component comprising citric acid and malic acid.
WO2019081525	Nutrileads BV (NL)	<b>Method of producing a pectic polysaccharide isolate enriched in rhamnogalacturonan-1.</b> The invention provides a method of producing a hydrolysed pectic polysaccharide isolate that is enriched in rhamnogalacturonan-1, said method comprising the steps of: <ul style="list-style-type: none"> <li>• providing a pectin-rich substrate that has been obtained from plant material without the use of organic solvent, said pectin-rich substrate containing at least 3% by weight of dry matter of pectic polysaccharides;</li> <li>• subjecting the pectin-rich substrate to enzymatic treatment to partially hydrolyse the pectic polysaccharides, said treatment enzymatic treatment comprising the use of one or more pectinases selected from pectin lyase (EC 4.2.2.10), pectate lyase (EC 4.2.2.2), rhamnogalacturonan galacturonohydrolase (EC 3.2.1.173), endo-polygalacturonase (EC 3.2.1.15), exopolygalacturonase (EC 3.2.1.67 and EC 3.2.1.82);</li> <li>• subjecting the partially hydrolysed pectic polysaccharides to ultrafiltration using an ultrafiltration membrane having a molecular weight cut-off in the range of 5 to 100 kDa; and</li> <li>• recovering the ultrafiltration retentate. The present invention further relates to the hydrolysed pectic polysaccharide isolate obtained by the present method and to a process of preparing a product selected from a nutritional formulation, a food product, a dietary supplement, a beverage or a pharmaceutical product, said process comprising addition of the aforementioned hydrolysed pectic polysaccharide isolate.</li> </ul>

Nº Publicación	Solicitante (País)	Contenido técnico
WO2019119664	Primelong Life Science Co Ltd (CN)	<b>Comprehensive antioxidant health care food product and preparation method therefor.</b> A comprehensive antioxidant health care food product, consisting essentially of the following ingredients in percent by mass: 10% to 60% of a grape seed extract, 0.05% to 30% of a Polygonum cuspidatum extract, 0.05% to 30% of a radix curcumae longae extract, 0.05% to 30% of a green tea extract, 0.05% to 30% of aloe vera gel lyophilized powder 200:1, and 0.05% to 30% of a citrus bioflavonoid, the grape seed extract having a polyphenol content of equal to or greater than 85%, the radix curcumae longae extract having a curcumin content of equal to or greater than 90%, the Polygonum cuspidatum extract having a resveratrol content of equal to or greater than 45%, and the green tea extract having a tea polyphenol content of equal to or greater than 90%. The preparation method for the health care food product comprises weighing the raw materials in percent by mass, passing same through a 70-90 mesh screen for screening, mixing same, adding assistant materials and mixing, granulation and drying.
WO2019114967	Symrise AG (DE)	<b>Protein-polyuronide conjugates and use thereof as emulsifiers.</b> The invention relates to protein-polyuronide conjugates, wherein at least one polyuronide is bonded to a protein by means of a covalent bond and the protein is of plant origin. The invention further relates to creaming-stable edible emulsions, beverage syrups, and ready-to-drink beverages, to the use of protein-polyuronide conjugates to produce foods and cosmetic or medical products, to the use of protein-polyuronide conjugates as emulsifiers, to a method for producing protein-polyuronide conjugates, and to the protein-polyuronide conjugates produced by means of the method.
WO2019121696	Unilever NV (NL)	<b>Plant-protein-based structurant.</b> The present invention relates to a solid, particulate plant-protein-based structurant composition comprising, based on total dry matter, a) 50-95 wt.% plant derived protein, b) 5-10 wt.% xanthan gum, c) 1-30 wt.% glucono delta lactone-derived acidulant. The invention further relates to a food product comprising said structurant composition. The invention further relates to a method for the preparation of said structurant composition and to a process for preparing a food product using said structurant composition.
WO2019071364	Univ Antofagasta (CL)	<b>Method for the outdoor cultivation of the micro algae muriellopsis sp. to produce biomass with a high lutein content and a low metal content, which has good antioxidant properties and is useful in preparing food for animal or human consumption.</b> The present invention relates to the field of biotechnology. In particular, the invention concerns a method for producing antioxidants from algae. Preferably, the invention relates to the production of biomass with a high lutein content and a low metal content from the micro algae Muriellopsis sp., with Spanish Bank of Algae access number BEA_IDA_0063B, dated 2 October 2017, and to the use thereof in the preparation of food for animal or human consumption.
WO2019094745	Wrigley W M JUN CO (US)	<b>Organogel compositions and their use as a controlled delivery system in confectionery products.</b> The present disclosure is directed to edible organogel compositions that comprise an organogelator and a flavor component, and processes for preparing the organogel compositions. The organogelator is ethyl cellulose or a combination of ethyl cellulose and an edible wax, preferably candelilla wax, rice bran wax, carnauba wax, paraffin, beeswax, polyethylene wax or combinations thereof. The ethyl cellulose preferably has an average ethoxyl content of from 45,0% to 47,0% by weight of the ethyl cellulose or from 48,0% to 49,5% by weight of the ethyl cellulose. The organogel compositions may be included as the flavor component in confectionery products, such as chewing gums.

## Bioproductos alimenticios para animales

Nº Publicación	Solicitante (País)	Contenido técnico
US2019159478	Archer Daniels Midland Co (US)	<b>Processes for producing animal feed from peanut feedstocks.</b> A method of producing animal food pellets wherein solid and liquid ingredients of the food are premixed and the resulting mash is extruded in a ring die pellet extruder without steam conditioning and the extruded pellets are cooled and/or dried as may be required. The premixed ingredients will have cohesive properties so that additional pelleting binding agents are not required to form a densified pellet. The resulting product will be a nourishing food that substitutes grain and other ingredients in the diet of animals.
WO2019083057	BM Bio Co Ltd (KR)	<b>Functional pet feed composition using microalgae having anti-obesity and anti-diabetic functions.</b> The present invention provides a pet feed composition containing: microalgae powder that is dried using a fluid bed dryer; or fucoxanthin extracted therefrom.

Nº Publicación	Solicitante (País)	Contenido técnico
WO2019121930	DSM IP Assets BV et al. (NL)	<b>Animal feed compositions and uses thereof.</b> The present invention relates to animal feed compositions comprising polypeptides having muramidase activity and polypeptides having xylanase activity and uses thereof.
WO2019112562	Hills Pet Nutrition Inc (US)	<b>Pet food composition and method of making pet food composition comprising enhanced levels of resistant starch.</b> Disclosed herein is a pet food composition and methods of making a pet food composition using an extrusion process, wherein the resultant pet food composition comprises an enhanced level of resistant starch. The pet food compositions disclosed herein may increase the proportions of beneficial gastrointestinal bacteria, such as Lactobacillus and Bifidobacterium, while decreasing deleterious bacteria such as Megamonas. The improved microbial environment resulting from the pet food compositions disclosed herein having an enhanced level of resistant starch may lead to both improved gastrointestinal and psychobiotic health for the animal consuming the pet food composition.
US2019183143	Jujo Paper Co Ltd (JP)	<b>Feed pellets for ruminants.</b> According to the present invention, feed pellets for ruminants containing a kraft pulp derived from a lignocellulosic material are provided, wherein the kraft pulp has a Canadian standard freeness of less than 400 ml.
WO2019098605	Lee Jung Bong (KR)	<b>Livestock feed.</b> The present invention relates to livestock feed and, more particularly, to feed supplemented with nutritional components such as vitamins to improve the health, such as immunity, of livestock and improve meat quality. Accordingly, the present invention provides livestock feed for the growth of pigs, cattle, chickens, and ducks, comprising tocopherol, germanium mineral, Acanthopanax plant extract, sea buckthorn (botanical name; Hippophae rhamnoides) fruit extract, sulfur, Hovenia dulcis peduncle extract, Angelica, Salvia miltiorrhiza extract, Platycodon extract, Prunus armeniaca, and zeolite as nutrition-enriched additives, and further comprising a soothing agent containing licorice in order to alleviate the pungency of the Salvia miltiorrhiza extract, the Platycodon extract, Angelica, and the sea buckthorn fruit extract.
WO2019115675	Mars Inc (US)	<b>Pet food product comprising denatured zein protein.</b> A process for the preparation of a food product, particularly a pet food product, comprising zein protein and particularly also comprising animal protein, said process comprising the steps of: (i) providing a composition comprising zein protein; (ii) treating the composition from step (i) to denature said zein protein to provide a composition comprising denatured zein protein; and (iii) mixing said composition comprising denatured zein protein with other ingredients of said food product, particularly animal protein.
US2019134132	Nestec SA (CH)	<b>Nutrition blend for health benefits in animals.</b> A method of minimizing fat accumulation in a growing animal without limiting caloric intake or preventing or treating obesity in an animal, the method comprising orally administering a ketogenic diet and a nutrient blend to the animal. The nutrient blend can include at least four nutrients selected from the group consisting of walnut, maitake mushroom extract, EGCG, turmeric root powder, lycopene, taurine, EPA, and DHA to the animal.
US10294442	Novamont Spa (IT)	<b>Process for the fractionation of seeds from oleaginous plants.</b> The invention relates to a process for the fractionation of seeds of oleaginous plants of to the Asteraceae family, comprising at least one mechanical pressing operation of the seeds and an extraction with polar organic solvent of the first residue obtained. Said process allows to separate oil, active substances and a solid residue which is particularly suitable to be used in animal feed. The present invention also relates to said solid residue and to its use for the production of animal feed, as well as to the extracted active substances and to their use as cosmetic and/or pharmaceutical ingredient.
WO2019075028	Syngenta Participations AG (CH)	<b>Improved animal feed compositions and methods of use.</b> The invention provides an animal feed composition comprising microbial $\alpha$ -amylase, for example, an animal feed composition comprising transgenic plant material comprising a microbial $\alpha$ -amylase (e.g., a thermostable microbial $\alpha$ -amylase). The invention further provides methods of increasing animal performance and/or the efficiency of feed utilization by an animal (e.g., for milk or meat production), comprising feeding to the animal an animal feed composition of the present invention.

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