

# VT BIOMASA PARA LA BIOECONOMÍA

# 43

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## PATENTES

Vigilancia Tecnológica  
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OBJETIVOS DE DESARROLLO SOSTENIBLE



## BOLETÍN BIOENERGÍA Y BIOPRODUCTOS

### Surfactantes de origen biológico: Patentes

Los surfactantes son moléculas anfifílicas que reducen la tensión interfacial. Debido a esta propiedad, sus moléculas se ubican en la interfase de fluidos como son los sistemas aceite-agua y aire-agua. La presencia de surfactantes en un medio acuoso aumenta la solubilidad en agua y la disponibilidad de compuestos orgánicos, siendo ésta una de sus principales propiedades para su aplicación en el área de la biotecnología ambiental para la eliminación y biodegradación de hidrocarburos contaminantes en aguas y suelos. Asimismo, se utilizan como agentes humectantes, espumantes, estabilizadores de emulsiones, dispersantes, detergentes y germicidas, entre otros, en la industria alimentaria, cosmética, farmacéutica y en la agricultura.

Los surfactantes se producen por vía química o por vía biológica. Los de síntesis química están siendo remplazados por los de origen biológico (biosurfactantes) debido a su menor toxicidad y mayor biodegradabilidad, siendo más respetuosos con el medioambiente. Además, son igualmente o incluso más eficaces que los surfactantes convencionales en multitud de aplicaciones, siendo más estables en condiciones extremas de pH, temperatura y salinidad. Asimismo, debido a sus propiedades anti-bacterianas, anti-VIH e incluso anti-cancerígenas, muchos podrían ser utilizados en aplicaciones biomédicas. No obstante, los costes de producción limitan todavía su utilización.

Los biosurfactantes son moléculas complejas producidas y secretadas por diferentes tipos de microorganismos y están constituidos por estructuras diversas como péptidos, glicolípidos (ramnolípidos y soforolípidos, por ejemplo), glicopéptidos, flavolípidos, fosfolípidos y ácidos grasos.

En este apartado se va a abordar cuál es la situación actual de las patentes en el área de los surfactantes de origen biológico. Para ello, se hará uso de la herramienta Global Patent Index con acceso a las bases de datos de la EPO (Oficina Europea de Patentes).

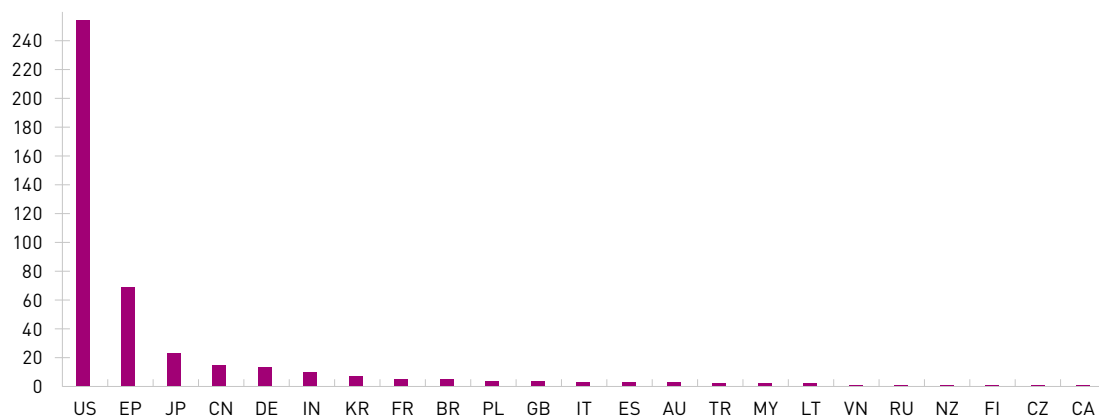
En la etapa comprendida entre enero de 2017 y septiembre de 2021, se identificaron más de cuatrocientas nuevas solicitudes internacionales de patente o solicitudes de patente europea relativas a surfactantes de origen biológico. En la Tabla 1 se recogen numerosos ejemplos de dichos documentos, pudiendo accederse a los textos completos de espacenet haciendo doble click sobre los números de publicación.

**Tabla 1.** Solicitudes de patente

Nº Publicación	Título	Solicitante	País del solicitante
<a href="#">WO2021010264A1</a>	Biosurfactant-producing recombinant microorganism	Aist et al.	Japón
<a href="#">WO2021124911A1</a>	Thickener	Aist et al.	Japón
<a href="#">WO2019045515A1</a>	Oil-in-water type cosmetic composition having stabilized high-content oil inner phase	Amorepacific Corp	Corea del Sur
<a href="#">WO2020173639A1</a>	Cleansing wipes soaked with soaking agents that contain biosurfactants	Beiersdorf AG	Alemania
<a href="#">EP3686265A1</a>	Detergent composition with sophorolipids	Bluesun Consumer Brnads SL	España
<a href="#">WO2020033255A1</a>	Fire extinguishing composition and method of making	Carrier Corp	EE.UU.
<a href="#">WO2020161735A1</a>	A process for the production and recovery of bio-surfactant from Bacillus sp. MCC0156	Council Scient Ind Res	India
<a href="#">WO2021078223A1</a>	Biochemical compound blocking remover, preparation method therefor and use thereof	China Petroleum & Chem Corp	China
<a href="#">WO2019090401A1</a>	Process for obtaining an improved urucum extract through the use of a biosurfactant and input for preparing cosmetic, pharmaceutical and nutraceutical formulations	Fernandes Pericles Leonardo	Brasil
<a href="#">WO2021062489A1</a>	A system and process for producing a biosurfactant and formulations comprising same	Global Bioprotect IP Pty Ltd	Australia
<a href="#">WO2020229006A1</a>	Biosurfactant-containing toothpastes	Henkel AG & Co KGaA	Alemania
<a href="#">WO2019108197A1</a>	Inkjet ink compositions	Hewlett Packard Development Co	EE.UU.
<a href="#">WO2019078854A1</a>	Printing on a textile	Hewlett Packard Development Co	EE.UU.
<a href="#">EP3760589A1</a>	Process for the valorization of biowaste and products obtained through the process	Hysytech Srl	Italia
<a href="#">WO2020146752A1</a>	Pharmaceutical delivery compositions and uses thereof	Innovacorium Inc	EE.UU.
<a href="#">WO2021165724A1</a>	Self-emulsifying composition, intended for administration onto the skin, containing biosurfactant, cosurfactant and oil phase	Invent Spolka Z Ograniczona Odpowiedzialnoscia	Polonia
<a href="#">WO2019140917A1</a>	Method for preparing lipopeptide biosurfactant from bacillus subtilis and use thereof in biodegradable environmentally friendly glass cleaning liquid	Jiangsu Lopal Tech Co Ltd	China
<a href="#">EP3808792A1</a>	Aqueous emulsion of polyether having at least one reactive silyl group	Kaneka Belgium NV	Bélgica
<a href="#">WO2020162103A1</a>	Method for producing gelatinous composition	Kaneka Corp	Japón
<a href="#">WO2021070778A1</a>	Nanodisc	Kaneka Corp et al.	Japón
<a href="#">WO2020142366A1</a>	Microbial hydrolysates for agricultural pest control	Locus Agriculture IP Co LLC	EE.UU.
<a href="#">WO2020257109A1</a>	Co-culture of Myxobacteria and Pseudomonas for enhanced production of biosurfactants and other metabolites	Locus IP Co LLC	EE.UU.

Nº Publicación	Título	Solicitante	País del solicitante
<a href="#">WO2020146219A1</a>	Emulsified water-in-diesel composition	Locus IP Co LLC	EE.UU.
<a href="#">WO2021030250A1</a>	Methods for increasing the bioavailability of OTC and pharmaceutical drugs	Locus IP Co LLC	EE.UU.
<a href="#">WO2019133315A1</a>	Organic food preservative compositions	Locus IP Co LLC	EE.UU.
<a href="#">WO2020263692A1</a>	Production of mel-like glycolipids and lipopeptides using a Bacillus sp. microorganism	Locus IP Co LLC	EE.UU.
<a href="#">WO2020198463A1</a>	Remediation of food production and processing effluents and waste products	Locus IP Co LLC	EE.UU.
<a href="#">WO2021087434A1</a>	Three-vessel reactor system for producing microbial biosurfactants and other metabolites	Locus IP Co LLC	EE.UU.
<a href="#">WO2019094615A1</a>	Multifunctional composition for enhanced oil recovery, improved oil quality and prevention of corrosion	Locus Oil IP Co LLC	EE.UU.
<a href="#">WO2019101739A1</a>	Treatment of parasitic infections of fish surfaces	Nederlands Inst Voor Ecologie Nioo Knaw et al.	Holanda/ Dinamarca
<a href="#">WO2020262567A1</a>	Composition comprising biosurfactant and carboxybetaine polymer	Oreal et al.	Francia/ Japón
<a href="#">WO2021015587A1</a>	Biosurfactant production apparatus and biosurfactant production method using same	Proxenrem Co Ltd	Corea del Sur
<a href="#">WO2020096904A1</a>	Aqueous coatings containing biosurfactants as bio-adjuvants and methods for using same	Rhodia Operations et al.	Francia/ EE.UU.
<a href="#">WO2021163810A1</a>	Method of using biosurfactant-producing bacteria against fungal and bacterial pathogens	The Royal Institution for the Advancement of Learning/ Mcgill Univ	Canadá
<a href="#">WO2019219531A1</a>	Cleaning composition	Unilever PLC et al.	Reino Unido
<a href="#">WO2019235840A2</a>	Fermented emulsifier for forming reverse micelle, composition comprising same and method for producing fermented emulsifier	United Active Inc	Corea del Sur
<a href="#">WO2020015680A1</a>	Bio-based nanofluid and application thereof in increasing recovery rate of low-permeability oil reservoir	Univ China Petroleum Beijing	China
<a href="#">WO2020104582A1</a>	Improved production of symmetrical bolaform sophorosides	Univ Gent	Bélgica
<a href="#">WO2019018594A1</a>	Potential of antibiotic effect	Univ North Carolina Chapel Hill	EE.UU.
<a href="#">WO2021058835A1</a>	Control of tumour growth and gut bleeding by biosurfactants	Univ Ulster	Reino Unido
<a href="#">WO2020234501A1</a>	Process for the aqueous extraction of biosurfactants from corn steep liquor	Univ Vigo	España
<a href="#">EP3502266A1</a>	Biosurfactant production	Vito NB et al.	Bélgica/ Paquistán

La distribución de las solicitudes de patente por país de prioridad se muestra en la Figura 1. Estados Unidos es, indudablemente, el país donde mayoritariamente se registraron dichas solicitudes (60%).



**Figura 1.** Distribución de las solicitudes de patente por país de prioridad (nº de solicitudes)

En la Figura 2 puede observarse cuáles son los códigos CPC (*Cooperative Patent Classification*) más representativos de las solicitudes de patente. Su significado y posición en el ranking se muestran en la Tabla 2. El análisis minucioso de la Figura 1 y de la Tabla 2 nos permite dilucidar las áreas a las que se dirigen las patentes, así como identificar los distintos usos y propiedades de los surfactantes de origen biológico. Los códigos CPC que aparecen en más del 10% de las solicitudes son A61K9 (*Medicinal preparations characterised by special physical form*), C12N1 (*Microorganisms, compositions thereof, processes of propagating, maintaining or preserving microorganisms or compositions thereof, processes of preparing or isolating a composition containing a microorganism, culture media therefor*), A61K8 (*Cosmetics or similar toilet preparations*) y A61K31 (*Medicinal preparations containing organic active ingredients*).



**Figura 2.** Códigos CPC más representativos (% solicitudes de patente)

**Tabla 2.** Significado de los códigos CPC más representativos y posición en el ranking de la Figura 2

#	CPC	Significado
12	A01N25	Biocides, pest repellants or attractants, or plant growth regulators, characterised by their forms, or by their non-active ingredients or by their methods of application, e.g. seed treatment or sequential application; Substances for reducing the noxious effect of the active ingredients to organisms other than pests
16	A01N43	Biocides, pest repellants or attractants, or plant growth regulators containing heterocyclic compounds
7	A01N63	Biocides, pest repellants or attractants, or plant growth regulators containing microorganisms, viruses, microbial fungi, animals or substances produced by, or obtained from microorganisms, viruses, microbial fungi or animals, e.g. enzymes or fermentates
12	A23L33	Modifying nutritive qualities of foods; Dietetic products; Preparation or treatment thereof
13	A23V2002	Food compositions, function of food ingredients or processes for food or foodstuffs
3	A61K8	Cosmetics or similar toilet preparations
1	A61K9	Medicinal preparations characterised by special physical form
4	A61K31	Medicinal preparations containing organic active ingredients
11	A61K35	Medicinal preparations containing materials or reaction products thereof with undetermined constitution
15	A61K36	Medicinal preparations of undetermined constitution containing material from algae, lichens, fungi or plants, or derivatives thereof, e.g. traditional herbal medicines
9	A61K38	Medicinal preparations containing peptides
10	A61K45	Medicinal preparations containing active ingredients not provided for in groups A61K31/00 - A61K41/00
5	A61K47	Medicinal preparations characterised by the non-active ingredients used, e.g. carriers or inert additives; Targeting or modifying agents chemically bound to the active ingredient
8	A61K2800	Properties of cosmetic compositions or active ingredients thereof or formulation aids used therein and process related aspects
17	A61P31	Antiinfectives, i.e. antibiotics, antiseptics, chemotherapeutics
5	A61Q19	Preparations for care of the skin
14	C07K14	Peptides having more than 20 amino acids; Gastrins; Somatostatins; Melanotropins; Derivatives thereof
10	C09D11	Inks
9	C09K8	Compositions for drilling of boreholes or wells; Compositions for treating boreholes or wells, e.g. for completion or for remedial operations
6	C11D1	Detergent compositions based essentially on surface-active compounds; Use of these compounds as a detergent
5	C11D3	Other compounding ingredients of detergent compositions covered in group C11D1
14	C11D11	Special methods for preparing compositions containing mixtures of detergents
2	C12N1	Microorganisms, e.g. protozoa; Compositions thereof; Processes of propagating, maintaining or preserving microorganisms or compositions thereof; Processes of preparing or isolating a composition containing a microorganism; Culture media therefor
9	C12N9	Enzymes; Proenzymes; Compositions thereof; Processes for preparing, activating, inhibiting, separating or purifying enzymes
17	C12N15	Mutation or genetic engineering; DNA or RNA concerning genetic engineering, vectors, e.g. plasmids, or their isolation, preparation or purification; Use of hosts therefor
14	C12P7	Preparation of oxygen-containing organic compounds
15	C12P9	Preparation of compounds containing saccharide radicals
9	C12R2001	Microorganisms
17	D06P1	General processes of dyeing or printing textiles, or general processes of dyeing leather, furs, or solid macromolecular substances in any form, classified according to the dyes, pigments, or auxiliary substances employed
26	D06P5	Other features in dyeing or printing textiles, or dyeing leather, furs, or solid macromolecular substances in any form
18	E21B43	Methods or apparatus for obtaining oil, gas, water, soluble or meltable materials or a slurry of minerals from wells

Los solicitantes líderes aparecen en la Figura 3. Como era previsible, entre ellos se encuentran muchas empresas norteamericanas. Entre ellas, resaltar, principalmente, Locus IP, con 51 solicitudes de patente. Tras ella, destacar Hewlett Packard Development, Locus Agriculture, Locus Oil y Henkel. Todas ellas disponen de más de 10 solicitudes.

En la Tabla 3 se recogen los códigos CPC más representativos de las solicitudes de patente de las instituciones líderes. Con ayuda de la Tabla 2, donde se muestra el significado de los distintos códigos, se pueden identificar las áreas de patentabilidad más relevantes de cada una de ellas. Así, por ejemplo, las patentes de Locus IP se dirigen a distintos microorganismos productores de biosurfactantes (C12N1), a la síntesis de biosurfactantes con oxígeno (C12P7) y con radicales sacáridos (C12P9), y a la aplicación de biosurfactantes en medicamentos (A61K9 y A61K31) y biocidas (A01N63). Asimismo, Hewlett Packard Development desarrolla patentes sobre tintes para teñir y estampar textiles donde se utilizan biosurfactantes (C09D11, D06P1 y D06P5).

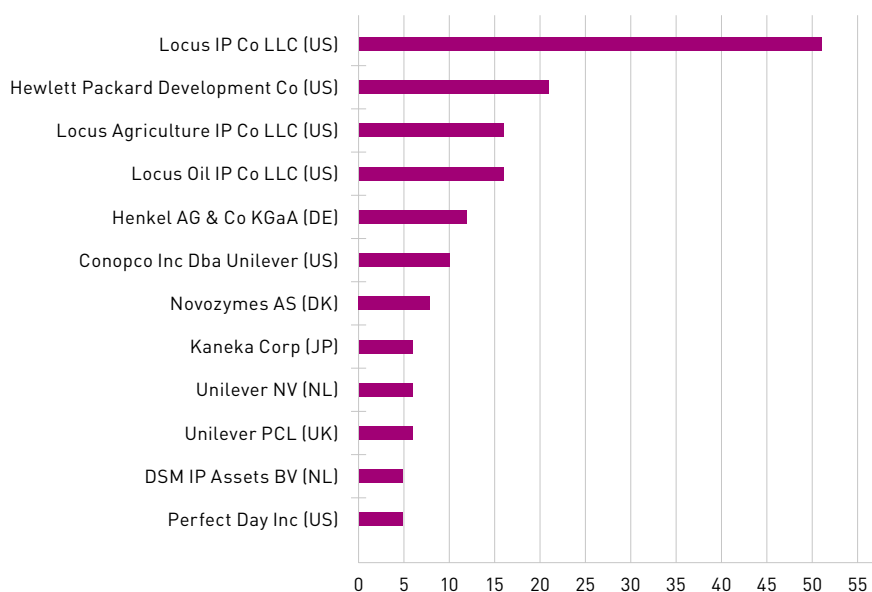


Figura 3. Solicitantes líderes (nº solicitudes)

Tabla 3. Códigos CPC de las patentes de los solicitantes líderes (véase su significado en la Tabla 2)

Instituciones	CPC
Locus IP Co LLC (US)	<ul style="list-style-type: none"> <li>• C12N1</li> <li>• A61K9</li> <li>• C12P9</li> <li>• A61K31</li> <li>• A01N63</li> <li>• C12P7</li> </ul>
Hewlett Packard Development Co (US)	<ul style="list-style-type: none"> <li>• C09D11</li> <li>• D06P5</li> <li>• D06P1</li> </ul>
Locus Agriculture IP Co LLC (US)	<ul style="list-style-type: none"> <li>• A01N63</li> <li>• A01N25</li> </ul>
Locus Oil IP Co LLC (US)	<ul style="list-style-type: none"> <li>• C09K8</li> <li>• E21B43</li> <li>• C12N1</li> </ul>
Henkel AG & Co KGaA (DE)	<ul style="list-style-type: none"> <li>• C11D3</li> <li>• C12N9</li> <li>• C11D1</li> </ul>
Conopco Inc. Dba Unilever (US)	<ul style="list-style-type: none"> <li>• A61Q19</li> <li>• A61K8</li> <li>• A61K2800</li> <li>• C11D1</li> </ul>
Novozymes AS (DK)	<ul style="list-style-type: none"> <li>• C11D3</li> <li>• C12N9</li> <li>• C11D11</li> </ul>
Kaneka Corp (JP)	<ul style="list-style-type: none"> <li>• A61K8</li> <li>• A61Q19</li> </ul>
Unilever NV (NL)	<ul style="list-style-type: none"> <li>• C11D1</li> <li>• A61Q19</li> <li>• A61K8</li> <li>• C11D3</li> </ul>
Unilever PCL (UK)	<ul style="list-style-type: none"> <li>• C11D1</li> <li>• A61Q19</li> <li>• A61K8</li> <li>• C11D3</li> </ul>
DSM IP Assets BV (NL)	<ul style="list-style-type: none"> <li>• A61K31</li> <li>• A61K45</li> <li>• A61P31</li> <li>• A23L33</li> </ul>
Perfect Day Inc (US)	<ul style="list-style-type: none"> <li>• C07K14</li> <li>• C11N9</li> </ul>

# PATENTES BIOENERGÍA

Biocombustibles sólidos (pellets, biochars, bio RDFs, bio SRFs, etc.)		
Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2021258077</a> <a href="#">A1 20211223</a>	Climate Robotics Inc (US)	<b>Autonomous device for in-field conversion of biomass into biochar.</b> Systems, methods and apparatus for the thermal conversion of biomass into biochar. A mobile platform may be used to maneuver a mobile biochar generation system within a field of biomass. The biomass may be harvested, preprocessed and pyrolyzed. After pyrolyzation, the biochar may be cooled to a predetermined temperature by integrating water and liquid nutrients into the biochar. The system may then control the application of the infused biochar by adjusting a spreading attachment and a plowing attachment.
<a href="#">WO 2022031243</a> <a href="#">A1 20220210</a>	Hakan Baslik Karya Farma Hbx Ar-Ge Tibbi Aromatik Bitkiler (TR)	<b>A pellet fuel obtained from organic wastes.</b> The present invention relates to a pellet fuel, having low carbon emission, obtained by means of collecting, cleaning and realizing various processes of waste forest trees, vegetables and fruit for evaluating said waste forest trees, vegetables and fruits. Accordingly, the pellet fuel comprises at least one vegetable waste selected from forest cutting and maintenance wastes; olive pulp and leaf; yellow squash residues and rinds; cabbage rinds; artichoke leaves, body, celery leaves, leek stalks and green part thereof, onion and garlic rinds, broccoli and cauliflower leaves, lettuce leaves, broad-bean, bean and pea rinds and cropland wastes, purslane and radish leaves and at least one fruit waste selected from orange rinds or wastes, plum (remainders which have not been harvested), chestnut rinds and thorny rinds, walnut leaves, fig leaves, watermelon and melon rinds with specific weight proportions. By means of this, green pellet fuel with high thermal value where bad smells are prevented is obtained.
<a href="#">WO 2022029373</a> <a href="#">A1 20220210</a>	Hedonis (FR)	<b>Oven for the oenological heating of wood.</b> The present invention relates to an oven intended to heat portions of wood so as give them oenological properties, the oven comprising at least one heating hearth in which combustion takes place, and a heating chamber in which the pieces of wood to be heated are placed. According to the invention, the heating hearth comprises a combustion chamber in which a solid fuel is placed and in which an oxidizing gas circulates, passing through a first end or inlet end of this combustion chamber, the gases released by the combustion that takes place in this combustion chamber being introduced into a substantially vertical combustion chimney, the combustion of the gases released as a result of the combustion of the solid fuel continuing in the combustion chimney.
<a href="#">WO 2022054974</a> <a href="#">A1 20220317</a>	Korea Inst Energy Res (KR)	<b>Apparatus for producing fouling-inhibiting hydrophobic cornstalk fuel for power generation using superheated.</b> The present invention relates to a cornstalk thermal energy processing apparatus, and relates to a dehydration system using steam in which, in a kiln-type cornstalk dehydrating apparatus, steam is sprayed across the full cross-section of the kiln main body for fuel dehydration, and, correspondingly, lifting vanes are used to induce free falling of the fuel to be dehydrated.
<a href="#">WO 2022037584</a> <a href="#">A1 20220224</a>	Shenzhen Ctrust Testing Tech Co Ltd (CN)	<b>Hydrothermal carbonization system and coupling system and application thereof for energy device.</b> A hydrothermal carbonization system and a coupling system and application thereof for an energy device, relating to the technical field of hydrothermal carbonization treatment. The hydrothermal carbonization system comprises a depolymerizing device and a carbonizing device provided downstream of the depolymerizing device. The hydrothermal carbonization system can realize the coupling of a "combustion boost" module of the small CSP "Brayton Cycle power generation" to form a wet biomass HTC clean boost coupling CSP microgrid energy station, for realizing treatment of the wet biomass, energy utilization and optimization.
<a href="#">WO 2022055236</a> <a href="#">A1 20220317</a>	Univ Hanyang Ind Univ Coop Found (KR)	<b>Apparatus for repurposing livestock waste as resource and method therefor.</b> The present invention relates to an apparatus for repurposing livestock waste as a resource and a method therefor. The apparatus for repurposing livestock waste as a resource comprises: a stirring unit for removing impurities precipitated while stirring livestock waste; a solid-liquid separation unit for separating livestock waste supplied from the stirring unit into a livestock waste cellulose component and an organic component with reference to a predetermined solid size through centrifugation; and a mixing molding unit for pellet-molding the livestock waste cellulose component to produce pellet solid fuel containing the livestock waste cellulose component. According to the present invention, ash generation is reduced by removing an organic component from livestock waste, thereby obtaining pellet fuel exhibiting uniform and excellent combustion efficiency.

## Syngas

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">EP 3933010 A1</a> <a href="#">20220105</a>	Commissariat Energie Atomique (FR)	<b>System for thermochemical conversion of a carbonaceous feedstock in a supercritical fluid comprising a batch reactor connected to a transfer tank containing a chemically inert liquid.</b> System for the thermochemical conversion of a carbonaceous charge comprising a batch reactor containing a mixture of supercritical fluid and the charge and a transfer tank containing a chemically inert liquid and connected to the reactor. The invention essentially consists of a thermochemical conversion system operating in cycles with a reactor which carries out the conversion under supercritical fluid, the mixture of which with the products resulting from a cycle is transferred into a transfer tank under the pressure of a liquid which simultaneously fills the reactor by return, a quantity of carbonaceous charge being introduced into the latter at each cycle. During a transfer, the liquid initially contained in the tank is set in motion by a pump and arrives from below in the reactor where it will push the supercritical mixture upward.
<a href="#">EP 3960837 A1</a> <a href="#">20220302</a>	Commissariat Energie Atomique (FR)	<b>Fixed-bed pyro-gasification reactor with improved efficiency.</b> Fixed bed pyro-gasification reactor comprising an enclosure, means for supplying the enclosure with carbonaceous material so as to form a bed in the enclosure, located in an upper part of the enclosure, a duct extending vertically in the enclosure so as to be surrounded by the carbonaceous material, the duct comprising an end for collecting syngas, a supply in secondary air to inject it into the duct, via another end of the duct, means for injecting methane into the duct via the other end of the duct, a primary air supply for injecting it into the enclosure in a combustion zone of the enclosure and an ignition system at the level of the other end of the pipe so as to cause the combustion of the mixture of air and gas, such as methane or pyrolysis gas.
<a href="#">EP 3950606 A1</a> <a href="#">20220209</a>	HBI Srl (IT)	<b>Biomass treatment process and plant.</b> Described is a plant and process for biomass treatment, where the plant is configured to actuate said process which comprises:- a step A of thermochemical treatment of transformation of a biomass comprising said biomass into a carbonaceous solid, where this transformation involves treating the biomass at a treatment temperature of between 150°C and 300°C and at a treatment pressure of between 10 atm and 50 atm for 0.5-8 hours, in the presence of water, with accessory production of a treatment gas which includes steam, carbon dioxide, nitrogen and sulfur compounds and traces of carbon monoxide and light aromatic hydrocarbons and polluting and odorous components;- a step B of mixing the treatment gas with an auxiliary gas containing oxygen compounds, to obtain operating gas;- a step C of thermochemical decomposition of the carbonaceous solid in an atmosphere consisting of the operating gas, where the thermochemical decomposition is suitable to obtain a combustible synthesis gas which mainly comprises carbon monoxide, molecular hydrogen, methane and carbon dioxide. The operating gas determines an oxygen supply in the thermochemical decomposition which is in a sub-stoichiometric quantity and the polluting and odorous components are decomposed in step C.
<a href="#">WO 2022034974</a> <a href="#">A1 20220217</a>	Korea Inst Energy Res (KR)	<b>Biomass fluidized bed gasification system.</b> The present invention provides a biomass fluidized bed gasification system characterized by comprising: a synthesis gas-generating device for synthesizing a synthesis gas by using biomass; a fire-extinguishing device for blocking the inflow of the synthesis gas and supplying nitrogen to prevent fires on the basis of results obtained by detecting the pressure, temperature, and oxygen concentration of the synthesis gas-generating device in real-time; and a recycling device for generating electricity by recycling, as a heat source, the synthesis gas removed of heavy metals, tar, and dust particles mixed in the synthesis gas generated in the synthesis gas-generating device, wherein the synthesis-gas generating device removes tar that is mixed with the synthesis gas.
<a href="#">WO 2022013843</a> <a href="#">A1 20220120</a>	Ronda High Tech Srl (IT)	<b>Method and reactor for processing a gas.</b> A plasma processing method for a gas comprises supplying a gas inside a cavity for plasma processing, supplying microwaves having a predetermined frequency and power in order to generate a plasma of the gas, and propagating the microwaves in the gas by means of a waveguide which communicates directly with the cavity so as to provide a plasma cracking processing operation for the gas inside the cavity.
<a href="#">WO 2022056559</a> <a href="#">A1 20220317</a>	Univ pretoria (ZA)	<b>Fluidised bed pyrolysis apparatus and method.</b> The invention provides a carbonaceous feed pyrolysis apparatus including two or more hot particle fluidised beds, and material transfer means for the transfer of hot catalyst particles between two or more of the beds, wherein one or more of the 5 fluidised beds is a gasifier which contains a gasification zone and one or more of the fluidised beds is a pyrolysis reactor which contains a pyrolysis zone, so that the particles are recirculated and serve as an energy carrier to drive pyrolysis in the pyrolysis zone. The invention extends to a carbonaceous feed pyrolysis process using said apparatus.

## Biogás

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">EP 3964558 A1</a> <a href="#">20220309</a>	Air Liquide (FR)	<b>Installation and method for adjusting the production of biomethane to the biomethane utilisation unit.</b> Installation for adjusting biomethane production according to the operation of a biomethane recovery unit, comprising:- A digester for producing biogas,- A membrane separation unit for producing a flow of biomethane and a flow of carbon dioxide from the biogas from the digester,- A biomethane recovery unit from the membrane separation unit,- A first means for mixing the biomethane flow and the carbon dioxide flow from the unit membrane separation,- A second means for sending a control signal from the recovery unit to the first means, and- A third means for recycling the mixture resulting from the first means in the digester.
<a href="#">EP 3964280 A1</a> <a href="#">20220309</a>	Air Liquide (FR)	<b>Device for controlling a facility for treatment of biogas by membrane permeation.</b> Arrangement for regulation of a plant I for the membrane permeation treatment of a feed gas stream, comprising at least methane and carbon dioxide, that includes at least one means A for measurement of the gross calorific value (GCV) of the feed gas stream, at least one means B for comparison of the gross calorific value with a setpoint value E, at least one means C for production of a control signal as a function of the comparison of the gross calorific value with the setpoint value E, and at least one means D for transmission of this control signal to a means for regulation of said plant I.
<a href="#">ES 2888900 A1</a> <a href="#">20220110</a>	Div de Inversiones Agrícolas y Ganaderas SL (ES)	<b>Digester, plant and biogas production procedure.</b> Slurry digester made up of an anaerobic container connected to a tank of biogas generated and heated by an external heat source. The digester comprises a digest inlet configured to connect to the heat exchanger and a return of digest through diffuser nozzles at the bottom of the container. In addition, the plant and the biogas generation procedure comprise an anaerobic connection between the farm producing slurry and the digester, without intermediate aerobic storage.
<a href="#">WO 2022016032</a> <a href="#">A1 20220120</a>	Freitas Shawn et al. (US)	<b>Methods to produce products from anaerobic digestion of poultry litter.</b> Some embodiments are directed to a process for forming products from animal waste (e.g., poultry litter). The products may include a controlled release fertilizer and renewable natural gas. The process may include providing a feedstock comprising greater than about 80 percent poultry waste and a moisture content of about 25 percent. The feedstock may be diluted to form a slurry having a moisture content of about 90%. The slurry may be mechanically refined to reduce the particle size distribution and the average particle size of the slurry. The slurry may be anaerobically digested to produce biogas and a digestate. The biogas may be converted to renewable natural gas, and the digestate may be converted to a controlled release fertilizer. Additionally, some embodiments are directed to methods of reducing nitrogen emission from soil amendments. Some embodiments are directed to reducing nitrogen emissions sufficient to produce emissions offset credits.
<a href="#">EP 3936617 A1</a> <a href="#">20220112</a>	Indian Oil Corp Ltd (IN)	<b>A booster composition to improve biogas yield and to stabilize the digester performance.</b> The present invention relates to a booster composition for enhancing the biogas yield and stabilizing the operation of a biomethanation plant, a method for the preparation of said booster composition and a method for enhancing the biogas yield and stabilizing the operation of a biomethanation plant using said composition by ameliorating the effect of shock conditions like pH and temperature. The booster composition comprises of specifically defined constituents selected from controlled release agents, redox potential balancers, direct interspecies electron transfer (DIET) improvers, micronutrient balancers, and Co-factors.
<a href="#">WO 2022055125</a> <a href="#">A1 20220317</a>	Korea Distr Heating Corp et al. (KR)	<b>Purification and recirculation system and method for improving recovery efficiency of methane in biogas.</b> The present invention provides a purification and recirculation system for improving the recovery efficiency of methane in biogas, comprising: a compressor for compressing inflow biogas; a separation membrane process part for separating the compressed biogas into biomethane, concentrated carbon dioxide and a by-product gas; and a gas electric generator for producing electricity by using the by-product gas, wherein the by-product gas generated at the separation membrane process part is recirculated or is supplied to the gas electric generator to produce electricity.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2022015545</a> <a href="#">A1 20220120</a>	Loci Controls Inc (US)	<b>Devices and techniques relating to landfill gas extraction.</b> Systems and methods for controlling extraction of landfill gas from a landfill via a gas extraction system are provided herein. According to some aspects of the technology, there is provided site-level control methods for globally controlling one or more wells based on one or more characteristics of aggregate landfill gas collected from a plurality of wells at a gas output. According to some aspects of the technology, there is provided well-level control methods for locally controlling a first well based on one or more characteristics of landfill gas collected from the first well. According to further aspects of the technology, there is provided hybrid control methods for making adjustments to a respective well based on both site-level and well-level control methods.
<a href="#">EP 3932874 A1</a> <a href="#">20220105</a>	Newlisi Spa (IT)	<b>Thermal alkaline oxidative hydrolysis pretreatment for wwtp sludge anaerobic digestion.</b> The present invention relates to a process for producing biogas, which comprises: subjecting depuration sludges to a pretreatment phase which comprises, as the sole hydrolysis phase, a thermal alkaline oxidative hydrolysis phase; subjecting the pretreated sludges to an anaerobic digestion process in order to obtain biogas. This process is applicable to a wide range of urban and industrial depuration sludges, in particular to depuration sludges with high salinity levels, characterized by an overall content of sulphates and chlorides equal to or greater than 800 mg/mL. This process allows to increase the methane fraction inside the biogas produced, so as to improve its quality in terms of energy yield.
<a href="#">WO 2022018386</a> <a href="#">A1 20220127</a>	Suez Groupe (FR)	<b>Biological treatment of effluents rich in carbonaceous matter and nitrogen with biogas production.</b> The invention relates to a method for biological treatment of an effluent, the effluent to be treated containing nitrogen in the form of ammonium and having a carbonaceous matter concentration measured by the chemical oxygen demand COD greater than or equal to 1 g per litre of effluent, the method comprising: a) a step of anaerobic digestion of the effluent to be treated in order to produce biogas and a digestate constituting a first liquid effluent having a reduced carbonaceous matter content, this step being implemented in a covered lagoon provided with a biogas recovery device, b) a step of biological treatment of the digestate obtained in step (a) in order to produce a second liquid effluent with reduced nitrogen content.
<a href="#">WO 2021253202</a> <a href="#">A1 20211223</a>	Wenzhou Lanbao Sapphire Tech Co Ltd (CN)	<b>Biogas production apparatus.</b> A biogas production apparatus, comprising: a biogas tank main body, a delivery pipe, a gas output pipe, a heat insulation layer, a temperature control layer, an annular baffle, a sealing ring, a sucker, a stirring wheel, a scraper and a residue outlet, wherein one side of the biogas tank main body is provided with a material storage cylinder; the material storage cylinder is connected to the biogas tank main body by means of the delivery pipe; one side of the heat insulation layer is provided with the temperature control layer; a temperature probe is mounted on one side of the bottom face of a top plate; the top face of the annular baffle is provided with a sealing groove; the sealing ring is embedded in an annular groove; the sucker is provided in a groove; a gas pump is connected to the sucker by means of a pipeline; the scraper is welded at one end of the stirring wheel; and a second delivery rod is provided in the residue outlet. The biogas tank main body is sealed using the cover plate, and the cover plate is closely attached to the biogas tank main body using the sucker, such that the sealing performance of the biogas tank main body is good. The temperature control layer is used to control temperature, so as to ensure that the biogas tank main body is at the optimal temperature. A skull on the inner wall of the biogas tank main body is scraped by the scraper, and a residue in the residue outlet is discharged by means of the second delivery rod, so as to ensure the smoothness of the residue outlet.

### Bioalcoholes (bioetanol, biometanol, etc.)

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2022058816</a> <a href="#">A1 20220324</a>	Ard Daran Co (IR)	<b>A method for producing bioethanol, protein, and lignin from lignocellulosic biomass.</b> Disclosed herein is a method for producing bioethanol, protein, and lignin from lignocellulosic biomass. The process may include three main steps: preprocessing and protein extraction, bio-ethanol extraction, and lignin extraction. This invention disclosed a method for preprocessing the lignocellulosic biomass by which the bioaccessibility of the biomass resources could be increased. In this method, the lignocellulosic biomass is preprocessed using a vapor jet within high pressure, wherein saturated vapor attenuates the bonds between lignin, cellulose, and hemicellulose, activating the biomass cell wall degrading enzymes (CWDEs). At the same time, the first step brings the highest protein extraction efficiency with high digestibility. In the second and third steps the bio-ethanol and lignin are extracted using a highly efficient manner, respectively.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">US 2021403958 A1</a> <a href="#">20211230</a>	Chemtex Global Corp (US)	<b>System and method for producing fuel grade ethanol from cellulosic and high starch combined feedstocks.</b> Ethanol is produced by the simultaneous production of both First and Second generation (1G, 2G) fuel grade ethanol in the same production plant. A First Generation feedstock such as corn is continuously fed to the first generation section and a lignocellulosic feedstock such as corn stover from the 1G corn is supplied to the second generation area. Thus, there is a common fermentation area for both the C5 and C6 sugar fermentation. The invention can economically be best implemented in places where there are incentives offered for the use of various feedstocks. Specifically, the invention allows the D3 rin to be maximized in an existing first-generation ethanol plant with the installation of the front end of the 2G equipment.
<a href="#">EP 3960816 A1</a> <a href="#">20220302</a>	Indian Oil Corp (IN)	<b>Method for a combined operation of a bioethylene recovery plant and a biogas plant.</b> An integrated approach for utilizing waste products of 2G bio-refineries to fractionate the lignin of high purity. The present invention also provides a method of recycling of two waste products (2-G ethanol residue as the substrate (LRBR) and fusel oil/synthetic fusel oil (SFO) as one of the solvent) of the biorefineries in a beneficial manner to fractionate the lignin of high purity. The present method of separating high purity lignin comprises fractionating extractive-free lignin rich residue with a solvent, wherein the solvent is a mixture of SFO/ Fusel oil and Formic acid. An optimized ratio of waste fusel oil and formic acid gave more than >85% yields of high purity lignin.
<a href="#">MY 173647 A</a> <a href="#">20200213</a>	International Islamic Univ Malaysia (MY)	<b>Production of bioethanol by direct bioconversion of oil palm empty fruit bunches (EFB) using lignocellulolytic fungi and yeast.</b> The bioethanol production was conducted by utilizing agriculture waste, palm oil empty fruit bunches (EFB) with the aid of <i>T. harzianum</i> and yeast, <i>Saccharomyces cerevisiae</i> using solid state bioconversion method. The compatibility of various fungal strains was done as to develop the direct bioconversion process of compatible mixed culture. Analyzes such ethanol estimation, reducing sugar and glucosamine as growth indicator were conducted in order to select the best experimented run for optimization. The optimization of process conditions, by using the central composite design (CCD) was carried out. Optimization of process condition was done with varied level of moisture content, pH, inoculum size, concentration of co-substrate (wheat flour) and mineral solutions. Statistical analysis showed that the optimum process condition for moisture content was 50% (v/w), pH of 4, inoculum size of 10% (v/v), concentration of wheat flour of 1% (v/v) and mineral solutions of 1% (v/v). The final optimization with the developed process conditions indicated that the maximum production was increased from 14.315% (v/v) to 34.785% (v/v).
<a href="#">US 2022041974 A1</a> <a href="#">20220210</a>	Marathon Petroleum Co LP (US)	<b>Systems and methods for holistic low carbon intensity fuel and ethanol production.</b> Systems and methods to provide low carbon intensity (CI) ethanol through one or more targeted reductions of carbon emissions based upon an analysis of carbon emissions associated with a combination of various options for feedstock procurement, feedstock refining, processing, or transformation, and ethanol distribution pathways to end users. Such options are selected to maintain the total CI (carbon emissions per unit energy) of the ethanol below a pre-selected threshold that defines an upper limit of CI for the ethanol.
<a href="#">GR 20200100194 A</a> <a href="#">20211111</a>	Panepistimio Patron et al. (GR)	<b>Production of <i>saccharomyces cerevisiae</i> cell factory without genetic modification for cellobiose and cellulose fermentation in a batch.</b> The purpose of the patent is to combine three biochemical processes in one: (a) enzyme production, (b) hydrolysis and (c) fermentation of de-ligninized cellulose for bioethanol production with the aim to reduce installation and operating costs without genetic modification. In particular, <i>Saccharomyces cerevisiae</i> cells are covered by starch gel (SG) containing <i>Trichoderma reesei</i> cells or cellulases. In this way, simultaneous hydrolysis of cellulose and cellobiose by cellulases or <i>Trichoderma reesei</i> cells that produce cellulases to glucose and the fermentation of the resulting glucose to alcohol is achieved. The cellulose to be fermented is de-lignified cellulose obtained from lignocellulose biomass by effect with NaOH solution or biologically. The preparation of the cell factories was examined by SEM and FTIR spectra while for the cellulose de-lignified tubular cellulose material (TC), XRD spectra were taken and porosimetry analyzes were performed. The <i>S. cerevisiae</i> / SG- <i>T. reesei</i> and <i>S. cerevisiae</i> / SG-cellulases cell factories fermented de-lignified cellulose and cellobiose to give 70% and 77% ethanol yields, respectively. Creation of cell factories can be created even with other microorganisms and enzymes to achieve other chemical processes, in the context of the development of white biotechnology for the production of chemicals and food.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">FR 3113068 A1</a> <a href="#">20220204</a>	Suex Groupe (FR)	<b>Method for the production of a sugar syrup from residual lignocellulosic biomass.</b> The invention relates to a method for producing a sugar syrup comprising fermentable sugars from lignocellulosic biomass comprising paper waste, in particular printable paper, printed paper or cardboard, said method comprising the following steps:a. optionally, a step of grinding said lignocellulosic biomass comprising paper waste;b. i. a step of impregnating said lignocellulosic biomass comprising paper waste or crushed lignocellulosic biomass obtained at the end of step a. in an aqueous medium, and ii. a heat pretreatment step implemented in the absence of acid addition, at a temperature of between 80°C and 150°C, at a pH of between 6.5 and 8, in order to obtain a pretreated product, said impregnation and heat pretreatment steps being carried out simultaneously or successively according to i. then ii. ;vs. a step of enzymatic hydrolysis of the pretreated product obtained at the end of step b. to convert cellulose and hemicellulose into a sugar syrup comprising fermentable sugars; and D. a step for recovering the sugar syrup comprising fermentable sugars obtained at the end of step c.
<a href="#">EP 3950914 A1</a> <a href="#">20220209</a>	Verbio Ver Bioenergie AG (DE)	<b>Method for a combined operation of a bioethylene recovery plant and a biogas plant.</b> The present invention concerns a method for carrying out the combined operation of a bioethanol production unit and a biogas unit. The method comprises the following steps:a) mashing corn meal from a dry milling step with at least 0.1 t of dry matter in the form of whole stillage and at least 0.1 m3 of outflow from the biogas unit per tonne of corn meal,b) feeding the mash from a) to a cooking stage with mash temperatures below the gelatinization temperature of the starch inn the corn meal, followed by an ethanol-forming fermentation step and then feeding the fermented mash to a distillation step,c) feeding the whole stillage from b) to the mashing step in a) and to the biogas unit.

## Biodiésel

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">MY 179912 A</a> <a href="#">20201119</a>	NG Long Seng (MY)	<b>A production method for biodiesel and plasticizer from biological oils and fats.</b> The present invention discloses an improved method for use in producing biodiesel and plasticizer derived from biological oils and fats. Said method comprising the steps of hydrolysing (10) biological oils and fats into free fatty acids prior to being esterified (20) into fatty acid alkyl esters and glycerol by stannous oxide (SnO) catalyst. The fatty acid alkyl esters are subjected to a fractional distillation process at a temperature of approximately 150 °C and above so as to obtain a fraction of fatty acid alkyl esters. The fraction of fatty acid alkyl esters is then submitted to an epoxidation reaction (30) involving a predetermined portion of hydrogen peroxide and stannous oxide (SnO) catalyst.
<a href="#">EP 3933011 A1</a> <a href="#">20220105</a>	Ren Fuel K2B AB (SE)	<b>Lignin esterified with a mixture of saturated and unsaturated fatty acids.</b> The present invention relates to a composition of functionalized lignin where the composition exhibits a good stability and where the composition may be used for preparing fuels. The invention further relates a method of preparing the composition.
<a href="#">WO 2022056155</a> <a href="#">A1 20220317</a>	Synthetic Genomics Inc (US)	<b>Recombinant algae having high lipid productivity.</b> The invention provides recombinant algal organisms that have a genetic modification to a gene or nucleic acid sequence encoding an RNA binding domain. In some embodiments the genetic modification can be a functional deletion or attenuation of the gene. The genetic modification results in a mutant organism with increased lipid productivity and/or higher biomass productivity. The lipid products of these mutants can be utilized as biofuels or to manufacture other specialty products. The recombinant mutants can also, optionally, have a genetic modification to a gene encoding an SG11 polypeptide. Methods of making and using the recombinant algal mutants and methods of producing lipids are also disclosed.
<a href="#">RO 135469 A2</a> <a href="#">20220128</a>	Univ Babes Bolyai Din Cluj Napoca (RO)	<b>Eco-friendly additive meant to increase the cetane number of diesel fuels and process for preparing the same.</b> The invention relates to a process for preparing a class of eco-friendly additives intended to increase the cetane number of diesel additives. According to the invention, the process comprises the reaction of esterification of alcohol groups from furane structure derivatives resulting from residual ligno-cellulosic plant materials, with individual fatty acids or mixtures of fatty acids resulting from vegetable oil hydrolysis or as a residual fraction from the bio-Diesel fuel preparation process, in the presence of a raw enzymatic preparation isolated as acetonic powder or previously immobilized isolated lipase, the reaction being completed while stirring at the ambient temperature, in vacuum, for 18...24 h, followed by the isolation-washing step, to result in eco-friendly additives made exclusively of natural renewable raw materials.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">MY 174387 A</a> <a href="#">20200415</a>	Univ Malaya (MY)	<b>A method of producing alumina supported calcium oxide for biodiesel production.</b> The present invention provides the method for producing a specific catalyst for biodiesel production. To increase the purity and performance of catalyst, calcium acetate is used as the source for producing calcium oxide as catalyst. $\gamma$ -alumina powder is heated at a temperature between 500 °C to 700 °C for about an hour. A desired amount of calcium acetate is dissolved in water, said desired amount of calcium acetate is predetermined to achieve weight ratio of calcium oxide and alumina 0.6: 1 to 1.2: 1. The dissolved calcium acetate is then mixed with alumina for about four hours. The mixture is then heated above boiling point to evaporate water. The mixture is then calcined at a temperature between 600 °C to 900 °C for about five hours to obtain the catalyst.
<a href="#">MY 169958 A</a> <a href="#">20190619</a>	Univ Malaysia Pahang (MY)	<b>Biodiesel and method for producing biodiesel.</b> A method for producing biodiesel from second generation feedstock using a catalyst comprising cement derived intermediates activated in an alcohol solvent. The second generation feedstock is transesterified with the activated catalyst and an alcohol while exposed to microwave radiation, and is capable of yielding high conversion rates of feedstock to biodiesel. The catalyst after the transesterification process is highly recyclable for further use.
<a href="#">MY 179537 A</a> <a href="#">20201110</a>	Univ Malaysia Pahang (MY)	<b>Recycling of used cooking oil to biodiesel.</b> The present invention relates to a system for producing biodiesel from cooking oil, comprising: a) an ultrasonic reactor (53); b) a feed for passing cooking oil (51) to the reactor (53); c) means for passing catalyst-incorporated methanol (52) to the reactor (53) to react with the oil forming a mixture of glycerin, unreacted methanol and unpurified biodiesel; d) a cyclone separator (54) connected to the reactor (53) to separate the mixture into a glycerin which is passed to a glycerin storage (61) and an unpurified biodiesel which is recycled to the reactor (53); e) a settling tank (57) for separating the unpurified biodiesel from any remaining glycerin; f) a biodiesel washing column (59) for receiving the unpurified biodiesel from the settling tank (57) whereby a pure stream of biodiesel is obtained and stored in a biodiesel storage (62).
<a href="#">MY 176268 A</a> <a href="#">20200724</a>	Univ Malaysia Teknologi (MY)	<b>Biodiesel and method of producing thereof.</b> The present invention is a method of production of biodiesel from waste cooking oil by transesterification in methanol. Accordingly, the method includes: a) preparing of alkaline modified zirconia catalyst by mixing zirconia with alkaline nitrate solution followed by drying, calcination and cooling; b) performing transesterification with heterogeneous alkaline modified zirconia catalyst; wherein the alkaline modified zirconia catalyst is selected from group comprising magnesium zirconia (Mg/ZrO <sub>2</sub> ), calcium zirconia (Ca/ZrO <sub>2</sub> ), and strontium zirconia (Sr/ZrO <sub>2</sub> ), m heterogeneous catalysis of transesterification of waste cooking oils to biodiesel.
<a href="#">MY 169433 A</a> <a href="#">20190409</a>	Univ Putra Malaysia (MY)	<b>Processes for producing virgin coconut oil, coconut cooking oil and raw material for coconut biodiesel.</b> The present invention relates to an improved process for the preparation of virgin coconut oil (VCO), raw material for high quality coconut biodiesel and coconut cooking oil from the coconut milk by applying microwave separation technology. It is based on the optimum set up of microwave power, time and temperature in the microwave irradiation separation system and initial preparation of coconut milk before microwave irradiation. Exposing the sample to microwave frequency at 2.45 GHz will rotate water molecules or dipoles at the rate of about 5 billions per second and free electrons and ions will oscillate or vibrate at the same rate. These effects will eventually create intermolecular collisions and will separate the sample into water, oil and solid. For preparation of VCO, the process is treated at the temperature less than 60°C while for raw material for coconut biodiesel and coconut cooking oil, the temperature is controlled up to 80°C. The whole process will take about 30 minutes at the power level of about 500 Watt. Once the process was established, the oil can be separated using conventional methods such as gravitational separation or centrifuge method. A special treatment is applied for the preparation of VCO in order to reduce disturbances. Although the process temperature for VCO a little bit higher than room temperature, the product retains the fresh scent and taste of coconuts. Furthermore, in terms of quality, this process can produce high quality VCO with about 54% lauric acid and 8.1% capric acid which is much better than available commercial VCO. The coconut biodiesel which has been produced from this oil is saving a specific energy which is comparable to palm oil biodiesel. However, the solidification point for this coconut biodiesel is around -11°C, these makes it suitable for winter season. Generally, this new process is chemical free, a faster method, easy to operate, high yield of about 10-11 coconut per litre of biodiesel oil, good quality of VCO, coconut biodiesel and coconut cooking oil. Furthermore these processes are suitable for producing of virgin oil, cooking oil and raw material for biodiesel from a source obtained from fruits of jatropha or kenaf, palm fruitlet or palm kernel or similar fruits or seeds or oily based plant such as algae.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">MY 172786 A</a> <a href="#">20191212</a>	Yanmar Co Ltd (JP)	<b>An acid test kit and an acid test method for determination of total acid number in biodiesel.</b> Provided is an acid test kit (70) for determination of total acid number in biodiesel. The acid test kit (70) is comprised of: a cylindrical shaped reaction vessel (10) for putting a biodiesel sample therein; a plate shaped stopper (20) provided with a neck insertion hole (21) at its center whose outer peripheral surface is fitted to an inner peripheral surface of the reaction vessel (10); a funnel shaped titrant vessel (30) for putting titrant therein, whose a neck (31) inserted into the neck insertion hole (21); and an auto dispenser (40) attached to a basal plane (33) of the titrant vessel (30), which is provided for dripping the titrant inside the reaction vessel (10) through the neck (31).

## Biohidrógeno

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">MY 173088 A</a> <a href="#">20191225</a>	Proton Power Inc (US)	<b>C-O-H compound processing for hydrogen or liquid fuel production.</b> Methods and systems are disclosed for extracting hydrogen and/or liquid fuel from a compound comprising carbon, oxygen, and hydrogen (?C-O-H?). The compound may include cellulose, lignin, and/or hemicellulose, for example. The compound may include a waste stream that includes at least one C-O-H compound. Water may be combined with the C-O-H compound to produce a wet form of the C-O-H compound (104-b). The wet form of the C-O-H compound (104-b) may be transferred into a reaction processing chamber (102-b). The wet form of the CO- H compound (104-b) may be heated within the reaction chamber (102-b) such that elements of the C-O-H compound dissociate and react, with one reaction product comprising at least hydrogen gas and/or liquid fuel. Some embodiments may utilize non-oxidation reactions to produce the hydrogen and/or liquid fuel, such as hydrous pyrolysis reactions. The hydrogen gas and/or liquid fuel may be utilized to generate electrical power, heat, or power different types of engines.
<a href="#">US 2022081629 A1</a> <a href="#">20220317</a>	Solena Group Inc (US)	<b>Methods, processes and systems for the production of hydrogen from waste, biogenic waste and biomass.</b> Provided herein are novel devices, systems, and methods of using the same, that enable plasma-enhanced gasification of biogenic hydrocarbon waste material comprising: a geometrically designed reactor having a biochar carbon catalyst bed, together with a gas inlet system disposed around a lower section of the apparatus to supply oxidant gas generated by an integrated oxygen absorber system; to enhance the partial oxidation of biogenic hydrocarbon waste materials using exothermic heat generated by an oxidation reaction created in part by the integrated oxygen absorber system into the apparatus, in order to optimize the quantity and quality of hydrogen production in the synthetic gas produced therein.
<a href="#">MY 172016 A</a> <a href="#">20191112</a>	Univ Malaysia Pahang (MY)	<b>System for hydrogen-methane production from POME.</b> The invention provides a system for producing hydrogen and/or methane from POME where acidogenic and methanogenic processes can take place in two separate steps within a single system. Following hydrogen production, the effluent from the first step which are largely volatile fatty acids (VFAs) could be fed into the second step where they are metabolized to methane via methanogenic. These consecutive processes have several advantages over the conventional individual or isolated single - step process, since it permits the selection and the enrichment of different bacteria in each anaerobic digester (chamber) and increase the stability of the whole process by controlling the acidification phase in the first step. This prevents the inhibition of the methanogenic population in the second digester.
<a href="#">MY 172164 A</a> <a href="#">20191115</a>	Univ Teknologi Petronas (MY)	<b>Catalyst for gasification of biomass for production hydrogen and method of preparation thereof.</b> A method for catalytic gasification of biomass to produce hydrogen is provided. The method includes treating biomass with a zeolite beta (BEA) impregnated with a first metal and a second metal.

## Bio-jet fuels

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2022032266</a> <a href="#">A1 20220210</a>	Honeywell Int Inc (US)	<b>Renewable transportation fuel process with thermal oxidation system.</b> A process for treating effluent streams in a renewable transportation fuel production process is described. One or more of the sour water stream and an acid gas stream are treated directly in thermal oxidation section. The process allows the elimination or size reduction of a sour water stripper unit, waste water treatment plant, and sulfur recovery unit.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">KR 20210158492</a> <a href="#">A 20211231</a>	Korea Res Inst Chemical Tech (KR)	<b>Highly active complex catalyst for one-pot hydrogenation reaction to produce jet fuel from bio-oil.</b> The present invention relates to a highly active complex catalyst, and more particularly, a high activity complex capable of improving the isomerization rate of aviation oil and the yield of aviation oil when manufacturing aviation oil from bio-oil through a one-pot hydrogenation reaction. It's about catalysts. The high-activity composite catalyst of the present invention is a high-activity composite catalyst for a one-pot hydrogenation reaction for producing jet oil from bio-oil, and includes a zeolite beta carrier; and a binary active metal containing nickel-molybdenum (NiMo) or cobalt-molybdenum (CoMo) impregnated in the carrier; and molybdenum: the weight ratio of nickel or cobalt is 1:1 to 3, characterized in that it.
<a href="#">WO 2022040766</a> <a href="#">A1 20220303</a>	Petroleo Brasileiro SA (BR)	<b>Catalysts and selective process for the production of renewable aviation fuels and biofuel produced.</b> The present invention relates to a process for the conversion of plant oils, animal fats, waste food oils and carboxylic acids into renewable liquid fuels, such as bio-naphtha, bioQAV and renewable diesel, for use in combination with fossil fuels. The process is composed of two steps: hydrotreatment and hydrocracking. The effluent from the hydrotreatment step contains aromatics, olefins and compounds resulting from the polymerization of esters and acids. This is due to the use of partially reduced catalysts without the injection of a sulfiding agent and allows for the production of a bioQAV of suitable quality for use in combination with fossil kerosene. Concurrently, the process generates, in addition to products in the distillation range of naphtha, kerosene and diesel, high-molecular-weight linear paraffins (up to 40 carbon atoms).
<a href="#">WO 2021260158</a> <a href="#">A1 20211230</a>	Topsoe Haldor AS (DK)	<b>Method for selective decarboxylation of oxygenates.</b> A broad aspect of the present disclosure relates to a process plant and a method for producing a hydrocarbon mixture suitable for use as an aviation fuel having an end-boiling point according to ASTM D86 below 300°C from a decarboxylation feedstock being a feedstock comprising fatty acid esters and/or triglycerides and comprising C18 side-chains, to a deoxygenated hydrocarbon mixture by directing said decarboxylation feedstock to contact a material catalytically active in decarboxylation under decarboxylation conditions where the ratio between deoxygenation by formation of carbon oxides and deoxygenation by formation of water is at least 1.5:1, 2:1 or 3:1, as measured by the ratio of C17 paraffins to C18 paraffins in the deoxygenated hydrocarbon mixture, with the associated benefit of such a decarboxylation based method selectively reducing the product carbon length by a single carbon atom, compared to a hydrodeoxygenation based method, which is beneficial for processes requiring a moderate reduction of end boiling point.
<a href="#">WO 2022053260</a> <a href="#">A1 20220317</a>	Topsoe Haldor AS (DK)	<b>Removing impurities in a process for producing hydrocarbon products.</b> Process for producing a hydrocarbon product, said process comprising: i) passing a feedstock originating from a renewable source and/or from a fossil source through a hydroprocessing step for producing a main hydrotreated stream; said hydroprocessing step comprising: passing the feedstock through one or more catalytic hydrotreating units under the addition of hydrogen for producing a first hydrotreated stream; passing the first hydrotreated stream to a first separation step comprising the use of a separation unit for particularly removing the impurities H <sub>2</sub> S, CO, CO <sub>2</sub> and H <sub>2</sub> O; withdrawing from said first separation step an overhead stream and separating an overhead hydrocarbon liquid stream thereof which is passed as a reflux stream to said first separation unit; withdrawing from said first separation step a bottom stream and passing at least a portion of said bottom stream to a dewaxing step comprising the use of one or more catalytic hydrotreating units under the addition of hydrogen for producing said main hydrotreated stream; and ii) passing the main hydrotreated stream to a second separation step for producing said hydrocarbon product.
<a href="#">WO 2022008534</a> <a href="#">A1 20220113</a>	Total Raffinage Chimie (FR)	<b>Jet fuel composition and method for producing a jet fuel composition.</b> The invention relates to jet fuel compositions, in particular jet fuel compositions having improved cold properties, and more particularly improved freezing point with respect to theoretical linear behavior, which are mixtures of jet fuel from petroleum origin and renewable component. To this effect, a jet fuel composition comprising a petroleum derived jet fuel component and a renewable component consisting of hydroprocessed esters and fatty acids is proposed, wherein the jet fuel composition contains 1 to 50vol% of the renewable component and has a freezing point of -40°C or below, preferably of -47°C and below, and the petroleum derived jet fuel component has a content of C <sub>9</sub> -C <sub>12</sub> normal paraffins from 17wt% to 30wt%.

## Otros biocombustibles

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">FI 20205654 A1</a> <a href="#">20211223</a>	Forchem Oyj (FI)	<b>Fuel product formed of tall oil fatty acids, and fuel blends containing said fatty acids.</b> The invention relates to a fuel product containing or consisting of a tall oil fatty acid (TOFA) fraction having a lower heating value (LHV) of 35 MJ/kg or more, the concentration of said tall oil fatty acid (TOFA) fraction in the fuel product being 100ppm to 100% by weight. This TOFA fraction is intended to serve as an energy-supplying fuel component in the fuel product.
<a href="#">US 2022081630 A1</a> <a href="#">20220317</a>	Fulcrum Bioenergy Inc (US)	<b>Feedstock processing systems and methods for producing Fischer-Tropsch liquids and transportation fuels.</b> A method for processing feedstock is described, characterized in that incoming feedstock is processed to selectively recover biogenic carbon material from the incoming feedstock. In some embodiments the incoming feedstock is comprised of mixed solid waste, such as municipal solid waste (MSW). In other embodiments the incoming feedstock is comprised of woody biomass. In some instances, the incoming feedstock is processed to selectively recover biogenic carbon material from the incoming feedstock to produce a processed feedstock having biogenic carbon content of 50% and greater suitable for conversion into biogenic carbon Fischer Tropsch liquids. The high biogenic carbon Fischer Tropsch liquids may be upgraded to biogenic carbon liquid fuels. Alternatively, the incoming feedstock is processed to selectively recover plastic material from the incoming feedstock to produce a processed feedstock having biogenic carbon content of 50% or less.
<a href="#">US 2022033722 A1</a> <a href="#">20220203</a>	Honeywell Int Inc (US)	<b>Renewable transportation fuel process with thermal oxidation system.</b> A process for treating effluent streams in a renewable transportation fuel production process is described. One or more of the sour water stream and an acid gas stream are treated directly in thermal oxidation section. The process allows the elimination or size reduction of a sour water stripper unit, waste water treatment plant, and sulfur recovery unit.
<a href="#">FR 3112773 A1</a> <a href="#">20220128</a>	IFP Energies Now (FR)	<b>Device and method for producing aromatics from biomass pyrolysis gas.</b> A device and process for the conversion of aromatic compounds, includes/uses: a unit for the separation of the xylenes suitable for treating a cut comprising xylenes and ethylbenzene and producing an extract comprising para-xylene and a raffinate; an isomerization unit suitable for treating the raffinate and producing an isomerate enriched in para-xylene which is sent to a fractionation train; a pyrolysis unit suitable for treating biomass, producing a pyrolysis effluent feeding, at least partially, the feedstock, and producing a pyrolysis gas comprising CO and H <sub>2</sub> ; a Fischer-Tropsch synthesis reaction section suitable for treating, at least in part, the pyrolysis gas, producing a synthesis effluent sent, at least in part, to the pyrolysis unit.
<a href="#">US 2022081631 A1</a> <a href="#">20220317</a>	Nat Tech & Eng Solutions Sandia LLC (US)	<b>Fuel and fuel blend for internal combustion engine.</b> A fuel or fuel blending agent for an internal combustion engine includes a ketone compound that is a C <sub>4</sub> to C <sub>10</sub> branched acyclic ketone, cyclopentanone, or a derivative of cyclopentanone. The ketone compound may be blended with a majority portion of a fuel selected from the group consisting of: gasoline, diesel, alcohol fuel, biofuel, renewable fuel, Fischer-Tropsch fuel, or combinations thereof. The ketone compound may be derived from biological sources. A method for powering an internal combustion engine with a fuel comprising the ketone compound is also provided.
<a href="#">US 2022033731 A1</a> <a href="#">20220203</a>	Reg Synthetic Fuels LLC (US)	<b>Method for the pretreatment of a biofuel feedstock.</b> In an aspect, a method is disclosed that includes contacting a composition with an aqueous solution to yield a mixture, where the composition includes one or more of animal fats, animal oils, plant fats, plant oils, vegetable fats, vegetable oils, greases, and used cooking oil, about 5 wt. % or more of free fatty acids, about 10 wppm or more of total metals, about 8 wppm or more phosphorus, about 20 wppm or more of nitrogen, and the aqueous solution includes [(NH <sub>4</sub> ) <sub>2</sub> H <sub>2</sub> EDTA, (NH <sub>4</sub> ) <sub>4</sub> EDTA, a monoammonium salt of diethylenetriaminepentaacetic acid, a diammonium salt of diethylenetriaminepentaacetic acid, a triammonium salt of diethylenetriaminepentaacetic acid, a tetraammonium salt of diethylenetriaminepentaacetic acid, (NH <sub>4</sub> ) <sub>5</sub> DTPA, a combination of citric acid and Na <sub>4</sub> EDTA, a combination of citric acid and Na <sub>2</sub> H <sub>2</sub> EDTA, a combination of citric acid and a monosodium salt of diethylenetriaminepentaacetic acid, a combination of citric acid and a disodium salt of diethylenetriaminepentaacetic acid, a combination of citric acid and a trisodium salt of diethylenetriaminepentaacetic acid, a combination of citric acid and a tetrasodium salt of diethylenetriaminepentaacetic acid, a combination of citric acid and Na <sub>5</sub> DTPA, or a combination of any two or more thereof, where the method further includes centrifuging the mixture to yield a first treated composition, wherein the first treated composition has less total metals and less phosphorus than the composition.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">US 2022025273</a> <a href="#">A1 20220127</a>	Reg Synthetic Fuels LLC (US)	<b>Decarboxylative co-dimerization process and synthetic fuels produced therefrom.</b> In an aspect, the application discloses a method for producing renewable hydrocarbon fuels where the method includes electrolysis of a mixture to produce an electrolysis product comprising a renewable diesel and optionally a renewable gasoline, where the mixture includes (i) free fatty acids from a biorenewable feedstock, and (ii) terminal monomethyl-branched carboxylic acids, and where the renewable diesel includes terminal monomethyl-branched paraffins and terminal monomethyl-branched alkenes.
<a href="#">WO 2022015223</a> <a href="#">A1 20220120</a>	Sunpine AB (SE)	<b>Tall diesel composition.</b> The present invention describes a tall diesel composition obtainable from a crude tall oil, said tall diesel composition comprising carboxylic acids in a range of 50 – 98 wt% and neutral components in a range of 2 – 50 wt%, wherein the tall diesel composition comprises 1 – 20 wt% rosin acids, 6 – 35 wt% saturated fatty acids and 59 – 74 wt% unsaturated fatty acids.
<a href="#">WO 2022034184</a> <a href="#">A1 20220217</a>	Topsoe Haldor AS (DK)	<b>Process and plant for producing gasoline from a renewable feed.</b> The present invention relates to a process and plant for producing hydrocarbon product boiling in the gasoline boiling range from a feedstock originating from a renewable source, the process and plant comprising a hydroprocessing stage which includes hydrodeoxygenation for producing renewable diesel and renewable naphtha, and subsequent aromatization of the renewable naphtha thereby also producing a light hydrocarbon gas stream, such as liquid petroleum gas (LPG), from which a hydrogen stream is produced.
<a href="#">WO 2022021909</a> <a href="#">A1 20220203</a>	Univ Huazhong Science Tech (CN)	<b>Bio-oil electrochemical upgrading method and bio-oil electrochemical hydrogenation upgrading device.</b> The present invention relates to the field of biomass energy utilization. Disclosed are a bio-oil electrochemical upgrading method and a bio-oil electrochemical hydrogenation upgrading device. The bio-oil electrochemical upgrading method comprises the following steps: (a) mixing bio-oil, an organic solvent, and a supporting electrolyte to obtain a catholyte; (b) preparing an acid solution as an anolyte; (c) constructing an electrochemical reactor by using the catholyte and the anolyte, and separating the catholyte from the anolyte by means of one or two ion exchange membranes, thus forming a current loop; and (d) introducing a protective gas into one side of the catholyte, and then introducing current by means of a working electrode and an anode electrode to perform electrochemical reaction, thereby implementing the electrochemical upgrading of the bio-oil. According to the present invention, the problem that carbon deposition is easily formed when the bio-oil is upgraded by a thermochemical method can be effectively solved, the bio-oil is subjected to electrochemical upgrading under mild conditions, and the content of bio-oleic acid, the content of aromatic components and the content of heavy components can be reduced by upgrading, so that the bio-oil is suitable for transportation and storage.

# PATENTES BIOPRODUCTOS

Biomateriales (de construcción, medicina, embalaje, etc.)		
Biocomposites y biofibras		
Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2022018184 A1 20220127</a>	Herbstreith & Fox GmbH & Co Kg Pektin Fabriken (DE)	<b>Use of an activated carrot fiber for producing products.</b> The present invention relates to the use of an activated carrot fiber for producing products in the food or non-food industry. The invention further relates to products that contain the activated carrot fiber.
<a href="#">EP 3932993 A1 20220105</a>	Ren Fuel K2B AB (SE)	<b>Lignin crosslinked with a polyunsaturated compound.</b> The present application relates to a solid material of crosslinked lignin where the lignin is crosslinked using polyunsaturated fatty acids, a composition and a method of preparing the solid material.
<a href="#">EP 3974134 A2 20220330</a>	Seiko Epson Corp (JP)	<b>Fiber structural body and manufacturing apparatus for the same.</b> A fiber structural body includes cellulose fibers and a binding material which binds the cellulose fibers, the cellulose fibers are contained at a content of 50.0 to 70.0 percent by mass with respect to the fiber structural body, and the binding material is a natural component.
<a href="#">EP 3940138 A1 20220119</a>	Taiwan Textile Res Inst (TW)	<b>Functional resin material, manufacturing method thereof, and moisture-sensed shrinking fabric.</b> A functional resin material is manufactured by the following reagents including a polyol, a polyamine, a first cross-linking agent, a second cross-linking agent, and a nanocellulose. Each of the first cross-linking agent and the second cross-linking agent includes an isocyanate block. The nanocellulose includes a repeating unit represented by formula (1).
<a href="#">WO 2021256471 A1 20211223</a>	Tomoegawa Co Ltd et al. (JP)	<b>Thermoplastic resin composite material, thermoplastic resin composite material particle, and molded article.</b> Provided is a thermoplastic resin composite material and a thermoplastic resin composite material particle which contain a cellulose fiber, can yield a molded article having excellent mechanical properties such as strength, and exhibit excellent molding processing properties by exhibiting excellent fluidity when molten. This thermoplastic resin composite material contains a cellulose fiber, a compatibilizer and a thermoplastic resin and is characterized in that the cellulose fiber contains essentially only a fiber having a fiber diameter of 1-50 μm and a fiber length of 10-400 μm, the compositional ratio based on the mass of the cellulose fiber and the mass of the thermoplastic resin is 10:90-80:20, and the thermoplastic resin composite material is such that the standard deviation of the areal ratio occupied by the cellulose fiber relative to a prescribed area is 15% or less in 10 arbitrary cross sections of the thermoplastic resin composite material.
<a href="#">WO 2022051854 A1 20220317</a>	Univ Alberta (CA)	<b>Biobased curing agents for epoxy resins.</b> Curing agents for epoxy monomers are prepared from the partial esterification of citric acid with certain alkyl or alkenyl alcohols. These curing agents, which contain mixtures of unreacted citric acid and monoalkyl or monoalkenyl citrate, and which are substantially free of trialkyl or trialkenyl citrate, are used without co-solvents for preparing biobased resins from plant oil-derived epoxides. The resulting biobased resins can in turn be used to prepare thermo set materials and biocomposites.
<a href="#">WO 2022049254 A1 20220310</a>	Univ Copenhagen (DK)	<b>Biodegradable composite material of pure amylose and cellulose nanofibres or cellulose nanocrystals.</b> Disclosed herein are composite materials comprising amylose, cellulose nanofibres or cellulose nanocrystals, and a plasticiser. The amylose is of high purity, specifically containing little or no amylopectin. The cellulose nanofibres or cellulose nanocrystals act to reinforce the disclosed composite materials. Also disclosed are methods of producing such composite materials, and their use.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2022006540</a> <a href="#">A1 20220106</a>	Univ Louisville Res Found Inc et al. (US)	<b>Fiber pretreatment for improved natural fiber - polymer composite feedstock production.</b> Provided are methods for preparing modified natural fiber composite feedstocks. In some embodiments, the presently disclosed methods include hydrolyzing agricultural fiber material, optionally soybean hulls, under conditions and for a time sufficient to remove some or all of the arabinose from the agricultural fiber material to produce an arabinose-deficient hydrolyzed product; hydrolyzing the arabinose-deficient hydrolyzed product under conditions and for a time sufficient to remove some or all of the xylose from the arabinose-deficient hydrolyzed product to produce a hydrolyzed fiber material; and combining a thermoplastic copolyester (TPC) with up to 35 wt. % by weight of the hydrolyzed material, whereby a modified fiber composite feed stock is prepared. Also provided are methods for isolating xylose removed from arabinose-deficient hydrolysates, modified fiber composites prepared by the presently disclosed methods, method for 3D printing structure using the modified fiber composites, methods for improving at least one characteristic of modified TPC composites, and methods for improving fused filament fabrication (FEE) processes.
<a href="#">WO 2022015588</a> <a href="#">A1 20220120</a>	UT Battelle Llc (US) et al.	<b>Surface-modified and dried microfibrillated cellulose reinforced thermoplastic biocomposites.</b> A process for producing dried, vinyl carboxylate surface-modified microfibrillated cellulose having improved mechanical properties and a microfibril structure and a process for producing a vinyl carboxylate, surface-modified microfibrillated cellulose - thermoplastic polyester or thermoplastic polyolefin composite material having improved mechanical strength properties utilizing dried, vinyl carboxylate surface-modified microfibrillated cellulose.
<a href="#">EP 3944943 A1</a> <a href="#">20220202</a>	Whirlpool Co (US)	<b>Appliance liner having natural fibers.</b> A liner for a household appliance includes a first polymeric capping layer and a polymeric base layer. The first polymeric capping layer includes a first pigment additive. The polymeric base layer is coupled to the first polymeric capping layer. The polymeric base layer includes one or more polymers, a second pigment additive, and a natural fiber. The natural fiber can be present at a concentration of at least 50% by weight of the polymeric base layer. Methods of producing the liner for the household appliance are also disclosed.

## Bioplásticos

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2022017639</a> <a href="#">A1 20220127</a>	Bio Bond Aps (DK)	<b>Bio-based plasticiser for resins and blends containing said plasticiser.</b> The present invention relates to a family of preferably bio-based plasticisers and resins containing said plasticisers. The disclosed plasticisers belong to the poly (ester ether) family. Resins containing the plasticisers exhibit a broad range of applicability in terms of suitable processing techniques and utilisation for final products.
<a href="#">WO 2022054081</a> <a href="#">A1 20220317</a>	Council of Scient and Industrial Research an Indian (IN)	<b>A bioprocess for the simultaneous production of polyhydroxybutyrate and violacein pigment from himalayan bacterium iodobacter SP. PCH.</b> The present disclosure provides a bioprocess for the simultaneous production of Polyhydroxybutyrate (PHB) and Violacein pigment in a single fermentation using a Himalayan bacterial isolate Iodobacter sp. PCH 194, having accession number MTCC 25171. PHB has plastic properties, renewable origin and bio-degradable nature. It can be used for various packaging applications replacing the petrochemicals-based plastics, thus providing greener alternative to environment. Violacein pigment has anti-oxidant, anti-tumoral, anti-bacterial, and photo-protective properties and can be used in cosmetics and pharmaceuticals applications. The present disclosure provides production process of two valuable products i.e. PHB and violacein pigment in a single bioprocess, therefore, is economically attractive, time saving, and commercially feasible process.
<a href="#">WO 2021251162</a> <a href="#">A1 20211216</a>	Kaneka Corp (JP)	<b>Method for producing polyhydroxyalkanoate sheet and use of same.</b> The purpose of the present invention is to provide a production method capable of obtaining a PHA sheet using a simple operation as an alternative to spray drying. The aforesaid problem is overcome by providing a method for producing a polyhydroxyalkanoate sheet comprising: (a) a step for preparing an aqueous polyhydroxyalkanoate suspension having a pH of 7 or lower and (b) a step for using a heating and pressing device to heat and pressurize the aqueous polyhydroxyalkanoate suspension prepared in step (a).
<a href="#">WO 2022050815</a> <a href="#">A1 20220310</a>	LG Chemical Ltd (KR)	<b>Poly lactide stereocomplex and preparation method therefor.</b> The present invention relates to a poly lactide stereocomplex exhibiting excellent heat resistance and remarkably improved elongation characteristics while even maintaining biodegradability, and a preparation method therefor.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2022008484</a> <a href="#">A1 20220113</a>	Nestle SA (CH)	<b>Rigid biodegradable food container.</b> The present invention relates generally to the field of biodegradable food containers. In particular, the present invention relates to rigid food containers comprising at least one layer comprising polyhydroxyalkanoate (PHA) and another layer comprising cellulosic fibres. For example, the food container may be a food bottle. One embodiment of the present invention relates to a rigid biodegradable food container comprising an inner container comprising at least one PHA biodegradable polymer and an outer container comprising cellulose.
<a href="#">WO 2022049590</a> <a href="#">A1 20220310</a>	Sista Rahul (IN) et al.	<b>Bioplastic material.</b> A method of obtaining bioplastic material is disclosed. The method includes adding carbon polymer and a solvent into a batch container then mixing the carbon polymer and the solvent thoroughly to obtain a base mixture. The method includes adding plasticizer complex and an enzyme to the base mixture and mixing thoroughly to obtain a first mixture. The method includes adding fertilizer material to the first mixture and mixing thoroughly to obtain second mixture. The method includes supplying a heat with a predefined temperature to the second mixture, wherein once the second mixture converts to a gel-like semi-solid, then transfer the gel-like semi-solid to a cooling system. The method includes incubating the gel-like semi-solid mixture to the cooling system for predefined period of time. The method further includes molding the incubated gel-like semi-solid mixture into required shapes and forms.
<a href="#">WO 2022045959</a> <a href="#">A1 20220303</a>	Sui Jianjun (SG)	<b>Process for the purification of lactide.</b> This invention relates to a process by means of distillation for the purification of lactide from a crude lactide vapor product stream, which crude lactide is produced by depolymerization of low molecular weight polylactic acid and is composed of at least water, lactic acid, lactide and lactic acid oligomers, wherein a divided wall column is used as one of the distillation stages to obtain a purified liquid lactide product stream as the sidedraw of the said divided wall column.
<a href="#">WO 2022058623</a> <a href="#">A1 20220324</a>	Univ Leuven Kath (BE)	<b>High melt strength polylactic acid polymers.</b> The invention relates to methods for producing a lactic acid based polymer, which comprises co-polymerisation of lactide with cyclic dimer of another $\alpha$ -hydroxy-acid as co-monomer of opposite $\alpha$ -carbon chirality.
<a href="#">WO 2022060922</a> <a href="#">A1 20220324</a>	Univ Maryland (US)	<b>Lignocellulosic bioplastics and composites, and methods for forming and use thereof.</b> A solid lignocellulosic bioplastic can be formed from a biomass comprising an intertwined structure of lignin, hemicellulose, and cellulose. The lignin in the biomass can be dissolved such that the cellulose is fibrillated. After the lignin dissolution and cellulose fibrillation, the lignin can be regenerated in situ. The regenerated lignin can be deposited on and can form hydrogen bonds between the fibrillated cellulose, so as to form a slurry of lignin-cellulose solids in solution. The slurry can then be dried to form the bioplastic. In some embodiments, the lignin is dissolved by immersing the biomass in a first chemical. The lignin can then be regenerated in situ by addition of a second chemical to the first chemical.
<a href="#">WO 2022024099</a> <a href="#">A2 20220203</a>	Univ Nova de Lisboa (PT)	<b>Polyhydroxyalkanoates and methods thereof.</b> The present disclosure relates to polyhydroxyalkanoates (PHA) polymer and methods of obtaining thereof. Specifically, the present disclosure relates to methods of preparing PHA polymer enriched in medium-chain length (mcl) monomers.

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

### Biofertilizantes, bioadhesivos, etc.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2022003173</a> <a href="#">A1 20220106</a>	Bols Christian Marie (BE)	<b>Adhesive composition and method for the manufacture of white or bright-colored eco-efficient fiberboard and particle board.</b> The invention relates to an adhesive composition for agglomerating wood fibers or particles to form a light-colored panel, comprising at least one natural glue, the setting temperature of which is below 175°C. The invention also relates to the method for using this adhesive composition to produce light-colored fiberboard or particle board.
<a href="#">EP 3971255 A1</a> <a href="#">20220323</a>	Evertree (FR)	<b>Adhesive composition comprising heat treated dry plant meal and a water soluble prepolymer and/or water soluble reactive prepolymer.</b> The invention relates to a process for preparing an adhesive composition comprising a heat treated dry plant meal, said heat treated dry plant meal and relating dispersions, adhesive compositions, articles and uses of said heat treated dry plant meal.
<a href="#">EP 3971256 A1</a> <a href="#">20220323</a>	Evertree (FR)	<b>Adhesive composition comprising heat treated dry plant meal and a reactive prepolymer not being soluble in water.</b> The invention relates to a process for preparing an adhesive composition comprising a heat treated dry plant meal, said heat treated dry plant meal and relating dispersions, adhesive compositions, articles and uses of said heat treated dry plant meal.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2022055824</a> <a href="#">A2 20220317</a>	Intertape Polymer Corp (US)	<b>Sustainable water activated adhesive tape.</b> A water activated tape and method of producing is provided, the tape comprising a repulpable material, a water-soluble material affixed to the repulpable material, and a water activated adhesive layer affixed to the water-soluble material.
<a href="#">WO 2022045751</a> <a href="#">A1 20220303</a>	IUCF HYU Erica Campus (KR)	<b>Adhesive elastin and suckerin-based multiblock copolypeptide with stimulus responsiveness and surface adhesion, self-assembled structure thereof, and application of injectable hydrogel as bioadhesive.</b> The present inventors have intensively studied to develop a biocompatible material with stimuli reactivity and adhesion to various surfaces that can be used as a bioadhesive, and as a result, self-assembly ability with adhesive elastin-based polypeptide (EBP) and $\beta$ -sheet structure Design and manufacture a multi-block copolypeptide with high adhesion by self-assembly through fusion of a circular-based polypeptide (SBP) with It was confirmed that the block copolypeptide exhibits stronger adhesion and completed the present invention.
<a href="#">WO 2022025745</a> <a href="#">A1 20220203</a>	Montalvo Aguilar Karim Hassam et al. (MX)	<b>Biofertilisers and soil improvers based on sargassum spp. Macroalgae enriched with plant-growth promoting bacteria.</b> The invention relates to a formulation of a biofertiliser and soil improver based on Sargassum spp. macroalgae inoculated with plant-growth promoting bacteria (PGPB).
<a href="#">WO 2022025746</a> <a href="#">A1 20220203</a>	Pastrana Luna Jorge et al. (MX)	<b>Method for producing a biofertiliser and soil enhancer from sargassum spp. Macroalgae enriched with plant growth promoting.</b> This invention relates to a method for manufacturing a biofertiliser and soil enhancer from Sargassum spp. macroalgae and enriched with plant growth promoting microorganisms.
<a href="#">WO 2022019790</a> <a href="#">A1 20220127</a>	Sestec Polska SP ZOO (PL)	<b>Binding agent for cellulose-containing materials and a product containing it.</b> Easy to use and store, an environmentally friendly binding agent for cellulose-containing materials, without animal products, particularly suitable for use in the production of wood composites, and a composite material product obtained with the use of this binder is disclosed.
<a href="#">WO 2022003614</a> <a href="#">A1 20220106</a>	Stora Enso OYJ (FI)	<b>Method for preparing a bonding resin.</b> The present invention is directed to a method for preparing a bonding resin, wherein lignin in powder form or in the form of an aqueous dispersion is mixed with at an aqueous solution of least one substantially formaldehyde-free crosslinker that includes at least one amine, amide, imine, imide, or nitrogen-containing heterocyclic functional group that can react with at least one functional group of the lignin, at a pH in the range of from 3 to 9, and optionally one or more additives.
<a href="#">WO 2021257874</a> <a href="#">A1 20211223</a>	US Agriculture (US)	<b>Adhesive compositions and methods of adhering articles together.</b> Adhesive compositions containing one or two adhesive compositions produced from the fruit but not the seeds of Osage orange fruit and a known adhesive. The one or two adhesive compositions produced from the fruit but not the seeds of Osage orange fruit are produced by a process involving drying the cut peel and mesocarp but not the seeds of the fruit of Osage orange to produce dried peel and mesocarp, milling the dried peel and mesocarp to produce milled peel and mesocarp, extracting the milled peel and mesocarp with an organic solvent (e.g., hexane) or a polar aprotic solvent (e.g., ethyl acetate) to produce the first adhesive composition, and optionally wherein the amorphous layer between the polar aprotic solvent and the milled peel and mesocarp is the second adhesive composition.

## Biocosméticos, Biofarmacéuticos

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">EP 3943077 A1</a> <a href="#">20220126</a>	Emerald Health Biotechnology Espana SL (ES)	<b>Use of juniper (<i>Juniperus communis</i>) berries extract and agathadiol as positive allosteric modulators of cannabinoid type 1 receptor.</b> It is disclosed a <i>Juniperus communis</i> extract comprising agathadiol, and pharmaceutical compositions comprising said extract, for use in the prevention and/or treatment of a disease or condition responsive to positive allosteric modulators (PAM) of cannabinoid type 1 receptor (CB 1R). Additionally, disclosed is agathadiol, as well as pharmaceutical compositions comprising the same, for use in the prevention and/or treatment of a disease or condition responsive to positive allosteric modulators cannabinoid type 1 receptor. Finally, also disclosed are nutraceutical compositions comprising agathadiol, or a <i>Juniperus communis</i> extract comprising the same, for preventing or alleviating the symptoms of a disease or condition responsive to positive allosteric modulators cannabinoid type 1 receptor.

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<a href="#">WO 2022018392</a> <a href="#">A1 20220127</a>	Expanscience Lab (FR)	<b>Polysaccharide-rich bombax costatum flower extract.</b> The invention relates to an extract from the flowers, preferably from the calyxes, of <i>Bombax costatum</i> , to a process for preparing same and to the extract obtained by said process. The invention also relates to a composition comprising such an extract, the composition advantageously being a cosmetic, pharmaceutical or dermatological composition. The invention also relates to such a composition or such an extract for the use thereof in preventing or treating disorders or pathological conditions of the skin, the mucous membranes or the hair and nails, as well as the imbalance or disorders associated with the imbalance of the microbiota of the skin, the mucous membranes, the hair, the nails and associated skin appendages. Finally, the invention relates to a cosmetic care method for the skin, the hair and nails or the mucous membranes, with a view to improving the condition or the appearance thereof, which method consists in administering such a composition or such an extract.
<a href="#">EP 3936139 A1</a> <a href="#">20220112</a>	Fitoplancton Marino SL (ES)	<b>Tetraselmis chuii (T. Chuii) for the treatment of male infertility.</b> The present invention refers to a biomass of <i>T. chuii</i> , a protein extract of <i>T. chuii</i> and a pharmaceutical composition comprising a biomass of <i>T. chuii</i> or a protein extract of <i>T. chuii</i> , for use in the treatment of infertility in a male subject. It also refers to a method for increasing the quality of the semen of a male subject having normozoospermia, not having hypospermia and not having a disorder characterized by a high percentage of sperm DNA fragmentation (SDF), that comprises the administration of a biomass of <i>T. chuii</i> or a protein extract of <i>T. chuii</i> .
<a href="#">WO 2022061213</a> <a href="#">A1 20220324</a>	Grant Ind Inc (US)	<b>Biobased, biodegradable composite powder for use in cosmetics.</b> Cosmetic compositions useful intended for use in cosmetics and personal care formulations are disclosed. The cosmetic compositions include a micronized, substantially uniform powder mixture of a ferment containing a polyhydroxyalkanoate such as polyhydroxybutyrate and an amino acid derivative such as the lysine derivative N6-lauroyl-L-lysine. The cosmetic powder compositions can be intermediates that enhance the textural profile of cosmetics providing sensorial improvement, and/or soft-focus effects, line blurring effects by filling unevenness in the skin, making it appear smoother with less skin imperfections and wrinkles. The powder-based compositions can serve as detackifiers and/or viscosity modifiers due to its ability to absorb oil. The powder provides formulation options for cosmetics and personal care formulas prepared from biobased and biodegradable materials. Methods of preparing the powder compositions, as well as cosmetics containing the composition are also disclosed.
<a href="#">WO 2022002983</a> <a href="#">A1 20220106</a>	HFC Prestige Service Germany GmbH et al. (DE)	<b>Hair colouring compositions comprising a bio-based polymer and a crosslinker.</b> The instant disclosure generally relates to a composition for treating or coloring keratin fibers, the composition comprising at least one bio-based polymer and optionally a crosslinker. The composition may also comprise pigment microparticles. The composition formed and set in situ as a solid linked coating has a substantially permanent pigment lastingness and minimally alters the keratin fibers.
<a href="#">WO 2021255464</a> <a href="#">A1 20211223</a>	Hahn Norman (GB)	<b>Nutraceutical composition.</b> The invention relates to nutraceutical compositions useful in the treatment or prevention of diseases and/or disorders. In particular, the nutraceutical compositions contribute to strengthening of the immune system, resulting in the prevention and treatment of many diseases. A nutraceutical composition of the present invention comprises: C3 curcumin; Vitamin C; Chlorella, or an extract thereof, Spirulina, or an extract thereof; and Boswellia resin, or an extract thereof. An alternative nutraceutical composition of the present invention comprises: Coenzyme Q10; Spirulina, or an extract thereof; Moringa leaf, or an extract thereof; and Astaxanthin. The compositions may be used in the treatment or prevention of diseases such as chronic fatigue syndrome, immunodeficiency disorders, and viruses, in particular both acute COVID-19 infection and the COVID-19 sequelae or post viral fatigue known as long COVID. Furthermore, the compositions of the present inventions may be used in combination, or as a combination therapy in the treatment of different stages of a disease.
<a href="#">WO 2022013888</a> <a href="#">A1 20220120</a>	NBI Biosciences Private Ltd (IN)	<b>Anti-hypercholesterolemia composition and a method of manufacturing the same.</b> The invention relates to an anti-hypercholesterolemia composition and a method of manufacturing the composition. Accordingly, the present invention discloses the composition to lower the cholesterol formation and a method of manufacturing the same. The anti-hypercholesterolemia composition comprises <i>Basella alba</i> leaf extract in the range of 30 to 70 wt %, red yeast rice extract in the range of 5 to 50 wt %, squalene extract in the range of 1 to 30 wt %, cordyceps extract in the range of 10 to 70 wt % and at least one nutraceutically or pharmaceutically acceptable excipient in the range of 0.01 to 50 wt %.

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<a href="#">WO 2021262787</a> <a href="#">A1 20211230</a>	Oreal (FR) et al.	<b>Cosmetic compositions comprising biodegradable polymers.</b> Disclosed is a cosmetic composition that contains at least one polyhydroxy alcanoate (PHA) in the form of particles having an average diameter [d50] from 0.1 nm to 50 pm. The PHA may comprise between 0.1% w/w and 30% w/w of the total cosmetic composition, and some embodiments may utilize between 1% w/w and 8% w/w. The composition may include a silicone external phase or may be in the form of a loose or packed powder. Various PHAs may be utilized, although advantageously, the PHA may have a chain length 1 and 8 carbons. In some embodiments, the PHA may be selected to have an oil absorption of between 60 to 150 grams of a desired oil per 100 grams of PHA, where the desired oil may be, e.g., sebum. Further, the composition may optionally include one or more pigments. In use, the composition may be applied to a user's skin or hair.
<a href="#">WO 2022032394</a> <a href="#">A1 20220217</a>	The Adored Beast Apothecary Ltd (CA)	<b>Natural product extracts and methods of use thereof.</b> Described herein are various natural product extracts. For example, an alcohol extract of chaga is described herein. A substantially chlorophyll-free extract of phytoplankton green algae is also described herein. The extracts may be used alone or in combinations with each other and/or other active agents for preventing and/or treating inflammation, for preventing and/or treating oxidation, stimulating the immune system, for preventing and/or treating cancer, and/or for preferentially killing cancer cells over non-cancerous cells.
<a href="#">EP 3960772 A1</a> <a href="#">20220302</a>	Univ Do Minho (PT)	<b>Process for the production of xylan and xylan products from algae products and their uses.</b> The present disclosure refers to a process for preparing an oligosaccharide mixture which avoids the need for the currently used multi-step, expensive and hazardous processes and allows for the development of an environmentally friendly, sustainable, green chemistry production process. Particularly, the present disclosure refers to the production of xylo-oligosaccharides compositions, xylan and/or protein-rich preparations from algae, said process comprising algae washing, thermal drying and milling, aqueous extraction and an enzyme hydrolysis step. A second embodiment of the present invention refers to the use of said xylan products in several fields of industry, such as in food/feed, healthcare, research and development, materials, pharmaceutical, chemical, biofuels and/or cosmetic applications among others.

## Bioaditivos alimentarios

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2022047389</a> <a href="#">A1 20220303</a>	Cargil Inc (US)	<b>Pigment for meat substitute compositions.</b> Disclosed herein are pigment compositions for meat substitutes and meat substitutes including such pigment compositions. The pigment compositions include Phycoerythrin. In an aspect, the pigment compositions include red algae or a red algae extract. In an aspect, the pigment compositions provide a pink and/or red color to raw meat substitutes that transitions to a brown color or to colorless after cooking.
<a href="#">WO 2022008503</a> <a href="#">A1 20220113</a>	Cromologics APS (DK)	<b>Atrorosins as food colors.</b> The present invention provide scalable methods of producing newly identified atrorosin pigments, compositions comprising the pigments, lakes and dyes and uses thereof for colorings foods, such as dairy, meat substitutes or candy.
<a href="#">WO 2021259945</a> <a href="#">A1 20211230</a>	Firmenich & CIE (CH)	<b>Sweetening compositions and uses thereof.</b> The present disclosure generally provides low-calorie sweetening compositions that mimic the sensory properties of caloric sweeteners, such as sucrose. In some aspects, the disclosure provides uses of such compositions for sweetening or enhancing the sweetness of a flavored product, such as a food or beverage product. In some aspects, the disclosure provides flavored products, such as food or beverage products, that contain the sweetening compositions, optionally, in combination with one or more other sweeteners.
<a href="#">EP 3939437 A1</a> <a href="#">20220119</a>	GNT Group BV (NL)	<b>A composition comprising spirulina extract.</b> The present invention relates to the use of a sulfated polysaccharide to stabilize a foodstuff containing phycocyanin from spirulina extract. It also relates to compositions and foodstuffs containing phycocyanin from spirulina extract and a sulfated polysaccharide. The foodstuffs can be syrups, jams, jellies, beverages, confectionary, fruit preparations, condiments and sauces. In particular, the invention uses sulfated polysaccharides from macroalgae such as fucoidan.
<a href="#">WO 2022029131</a> <a href="#">A1 20220210</a>	Herbstreith & Fox GmbH & Co KG Pektin Fabriken (DE)	<b>Activatable, deesterified pectin-converted fruit fiber.</b> The present invention relates to an activatable, deesterified fruit fiber and to a method for the production thereof. The invention also relates to the use of the deesterified fruit fiber as a thickening or structuring agent in various industrial products. The invention further relates to a mixture of the activatable deesterified fruit fiber and a soluble pectin. The invention finally relates to a food product, a feed product, a food supplement, a beverage, a cosmetic product, a pharmaceutical product or a medical product, which has been produced using the deesterified fruit fiber according to the invention.

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<a href="#">EP 3964195 A1</a> <a href="#">20220309</a>	Inst Dr Rilling Healthcare GmbH (DE)	<b>Composition for use in dietary supplements and / or cosmetic products comprising bacillus subtilis.</b> The invention relates to a composition for a food supplement and/or a cosmetic product, comprising: - at least 70 wt.% of a plant oil and/or fatty substance, - at least 0.5 wt.% of silicic acid, and - at least 0.05 wt.% of bacillus subtilis selected from one of the strains comprising LA13030, CU1, HU58, DE 111, DSM 15544, PXN 21, Rosell-179, and/or DSM 33619.
<a href="#">WO 2022029384</a> <a href="#">A1 20220210</a>	Marie Beatrice (FR)	<b>Process for producing at least one intermediate food product capable of forming a mousse and/or having emulsifying and/or gelling properties - associated products.</b> The present invention relates to a culinary process for preparing an intermediate food product or IFP having gelling and emulsifying properties and serving as a texturing agent for the production of a final food product which is in the form of a gelatin, a mousse or an emulsion, said process comprising a step S1 of providing horse beans.
<a href="#">WO 2022025132</a> <a href="#">A1 20220203</a>	San Ei Gen Ffi INC (JP)	<b>Emulsion-containing gel composition, food containing emulsion-containing gel composition, and method for manufacturing same.</b> An emulsion-containing gel composition contains a gelling agent and an emulsion comprising an oil/fat and an emulsifier comprising water-dispersible fine particles or a water-soluble emulsifier containing a protein and an anionic polysaccharide. Sodium casein, alkaline treated gelatin, whey protein, or soy protein, etc., may be used as the protein. Xanthan gum, carrageenan, or native gellan gum, etc., may be used as the anionic polysaccharide. One or more substances from among agar, mannan, gelatin, kappa/iota carrageenan, xanthan gum, locust bean gum, tamarind seed gum, curdlan, tara gum, guar gum, and methyl cellulose, etc., may be used as the gelling agent. The present invention makes it possible to provide a satisfactory gelling agent and food containing an appropriate amount of oil/fat even if mixed with another material such as meat when the gel is crushed.
<a href="#">WO 2021263230</a> <a href="#">A1 20211230</a>	Sensient Colors Llc (US)	<b>A dosage form coating composition is disclosed.</b> The composition includes an alginate, a pectin, a plasticizer, and optionally an emulsifying agent. The alginate is present in an amount by weight of at least 40.0% and at most 80.0% and the pectin is present in an amount by weight of at least 16.0% and at most 40.0% - and/or - the alginate and the pectin are present in a weight ratio of at least 1 : 1 and at most 5:1. The dosage form coating composition, when applied to a dosage form to a 3% to 5% weight gain, provides a coated dosage form having an enteric coating. The coated dosage form has at least two sequentially observed properties exhibiting enteric coating behavior.
<a href="#">WO 2022056648</a> <a href="#">A1 20220324</a>	Univ Chile (CL)	<b>Natural surfactants comprising soluble nanocomplexes of quinoa proteins/anionic polysaccharides (alginate) and cationic polysaccharides (chitosan) for use in foods and cosmetics.</b> The present invention relates to: natural surfactants comprising soluble nanocomplexes of quinoa proteins/anionic polysaccharides (alginate) and cationic polysaccharides (chitosan); a production method for same; food emulsions comprising same, when edible vegetable oils are used as a fatty phase; and the use thereof in low-calorie food products such as sauces, creams and dressings.

### Bioproductos alimenticios para animales

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<a href="#">WO 2021254900</a> <a href="#">A1 20211223</a>	Alzchem Trostberg GmbH (DE)	<b>Increasing the metabolic energy in animal feed.</b> The present invention relates to the use of guanidine, guanidinoacetic acid and arginine and the salts thereof to increase the metabolic energy of an animal feed for ruminants.
<a href="#">WO 2022026517</a> <a href="#">A1 20220203</a>	Blue Buffalo Entrp Inc (US)	<b>Pet food.</b> A pet food is described that has a veneer on a surface that is low in sugar, low in moisture, transport stable, and has a smooth appearance at room temperature. A veneer includes a non-fat solids content of about 40% to about 60% by weight of the veneer, and a fat composition in an amount of 35% to 60% by weight of the veneer.
<a href="#">WO 2022043527</a> <a href="#">A1 20220303</a>	Bretagne Chimie Fine (FR)	<b>Use of a hydrolysate with high levels of free amino acids in a food for growing shrimp.</b> Disclosed is the use of a keratin hydrolysate comprising at least 88 wt% free amino acids relative to the total weight of amino acids of the hydrolysate, the remainder of the amino acids of the hydrolysate being in the form of peptides having a molecular mass less than or equal to 800 Dalton, the hydrolysate comprising 5 to 8 wt% arginine relative to the total weight of the hydrolysate, 8 to 13 wt% glutamic acid relative to the total weight of the hydrolysate, and 8 to 13 wt% proline relative to the total weight of the hydrolysate, in a food for feeding shrimp aged between 10 and 90 days.

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<a href="#">WO 2022040590</a> <a href="#">A1 20220224</a>	Kent Corp (US)	<b>Products and methods for increasing nitric oxide production and managing oxidative stress.</b> Disclosed are animal feeding products and methods contemplated to be useful to increase nitric oxide production and manage oxidative stress in an animal. The animal feeding products generally comprise arginine, choline, an ascorbyl compound, and zinc. Also contemplated is a method of feeding an animal comprising administering doses of arginine, choline, an ascorbyl compound, and zinc to a target animal over a period of time. The dose of arginine may range from about 0.2-10% total weight of feed/head/day. The dose of choline may range from about 0.1-10% total weight of feed/head/day. The dose of the ascorbyl compound may range from about 0.015-10% total weight of feed/head/day. The dose of zinc may range from about 0.01-10% total weight of feed/head/day.
<a href="#">WO 2022039329</a> <a href="#">A1 20220224</a>	Lee Hye et al. (KR)	<b>Functional feed composition for companion animal containing chicken liver and edible insects as effective ingredients.</b> The present invention addresses the problem of providing a functional feed composition for a companion animal, the composition containing chicken liver and edible insects as effective ingredients. More specifically, it was confirmed that the composition containing chicken liver and edible insects as effective ingredients has the effect of reducing obesity in a companion animal, and thus can be used as a functional feed composition.
<a href="#">WO 2022058322</a> <a href="#">A1 20220324</a>	Novozymes AS (DK)	<b>Animal feed comprising insects or insect meal.</b> The present invention relates to an animal feed comprising insects or insect meal and a polypeptide having protease activity. It also relates to a method of degrading an arthropod exoskeleton comprising contacting said exoskeleton with a polypeptide having protease activity. The invention further relates to a method for improving nutritional value of insects or insect meal, comprising contacting the insects or insect meal with a polypeptide having protease activity.
<a href="#">WO 2022023880</a> <a href="#">A1 20220203</a>	Nestle SA (CH)	<b>Pet foods made by retorting at least one of yogurt, cheese, animal milk, or plant milk; and methods of making and using such pet foods.</b> A method of manufacturing a pet food may include retorting a composition comprising at least one material selected from the group consisting of (i) yogurt, (ii) cheese and (iii) a combination of one or more hydrocolloids and at least one of an animal milk or a plant-based dairy alternative to form the shelf-stable pet food. A product may include the pet food and also a container housing the pet food, the container including instructions to administer the pet food to a pet, preferably a companion animal, most preferably a cat. A method of providing nutrition to a pet may include administering the pet food to a pet, preferably a companion animal, most preferably a cat. The pet food optionally consists of the retorted material. The pet food optionally is low in lactose or lactose-free and optionally includes no added sugar relative to that in the material subjected to the retorting.
<a href="#">WO 2022011116 A1</a> <a href="#">20220113</a>	Spectrum Brands Inc (US)	<b>Interactive active rope pet chew and methods of making.</b> Compositions and methods for making an interactive and playful pet chew are described herein. The pet chew comprises a chew stick having a longitudinal axis and one or more portions disposed onto the chew stick. The one or more portions are configured to be rotatable around the longitudinal axis and/or movable along the pet chew. The present pet chew provides a complex and changeable configuration and compositions of balanced nutrition.
<a href="#">WO 2022049279</a> <a href="#">A1 20220310</a>	Ynovea (FR)	<b>Nutritional composition intended for animals.</b> The present invention relates to a nutritional composition of natural origin intended for animals, comprising the fat of at least one insect and at least one binder of plant, animal or mineral origin, and intended to be used as a complete food or food supplement, or for fishing as a lure or bait.
<a href="#">WO 2022026962</a> <a href="#">A1 20220203</a>	Zivo Bioscience Inc et al. (US)	<b>Natural feed composition derived from fresh water algal cultures for the promotion of animal growth.</b> A method and compound for promoting growth in both animals and humans are disclosed. The disclosed method utilizes a compound derived from a lipopolysaccharide (LPS) of gram-negative bacteria. The compound itself is a natural product with no observed adverse environmental impact. The compound is combined with conventional feed, such as a corn-soy feed, for administration to animals, such as poultry. Human application is possible, as well. The combination of the disclosed inventive compound and conventional feed works through multiple growth-related pathways within, for example, in healthy birds to enhance growth performance while also priming the immune system to expedite response to a disease challenge should one arise. Data indicate that the dietary mixture of the inventive compound in conventional feed suggests that the biomass alters the signaling of multiple growth-related pathways.

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# VT BIOMASA PARA LA BIOECONOMÍA

## PATENTES

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