

## OBJETIVOS DE DESARROLLO SOSTENIBLE



## BOLETÍN BIOENERGÍA Y BIOPRODUCTOS

### Papel usado como precursor de biocombustibles y bioproductos

Los residuos de papel, que incluyen papel de oficina, periódicos y revistas, envoltorios, servilletas y otros, representan aproximadamente el 25-30% de los residuos sólidos urbanos. Su reciclaje es fundamental para reducir la cantidad de residuos que se generan. Sin embargo, la reciclabilidad del papel puede verse limitada por la presencia de aditivos no reciclables, como plásticos o metales, o la acumulación de fibras cortas y contaminantes después de varios ciclos de reciclaje.

Actualmente, una alternativa prometedora para la gestión de estos residuos es la utilización de los residuos de papel en la síntesis de biocombustibles (principalmente bioetanol) y otros productos de alto valor añadido, como el ácido láctico y el ácido succínico. Esto no solo contribuye a la reducción del impacto ambiental de estos residuos, sino que también fomenta la transición hacia una economía circular. La producción de biocombustibles a partir de papel usado puede contribuir, adicionalmente, a la reducción de las emisiones de gases de efecto invernadero.

La composición media del papel usado varía según su origen y las condiciones de producción. En general, el papel usado está compuesto principalmente de celulosa (entre el 40-60% del total), la fibra principal del papel. También puede contener una cantidad variable de lignina (entre el 20-35% del total) y otros componentes como hemicelulosa (5-20% del total) y otros contaminantes como tintas, adhesivos, plastificantes y otros materiales no fibrosos que pueden reducir su reciclabilidad.



A día de hoy, la conversión eficiente de los residuos de papel sigue siendo un desafío debido a su estructura recalcitrante. Las cadenas de celulosa interactúan con la hemicelulosa y la lignina para formar un complejo de lignina-carbohidrato, lo que dificulta su despolimerización en azúcares fermentables que se puedan utilizar en distintos procesos de fermentación. Para superar este obstáculo, se han desarrollado diversos tipos de pretratamiento, como los realizados en medio ácido, medio alcalino, con ozono o vapor, que permiten una mayor accesibilidad del sustrato a los microorganismos y un mayor grado de conversión de los azúcares fermentables. La investigación en este campo es esencial para mejorar el rendimiento global del proceso.

Como resultado de la fermentación alcohólica de los azúcares liberados, se puede sintetizar bioetanol, el cual se utiliza como aditivo en las gasolinas y como combustible en motores de combustión interna. Por otro lado, la fermentación láctica de los azúcares conduce a la síntesis de ácido láctico, un compuesto de alto valor añadido. Éste se puede utilizar para producir una amplia variedad de productos, como bioplásticos (por ejemplo, el ácido poliláctico, PLA) y biopolímeros, los cuales tienen aplicaciones en diversos sectores, como el de los materiales, la industria alimentaria, la farmacéutica o la cosmética.

Con vistas a ofrecer una visión del grado de desarrollo de la tecnología, la Tabla 1 recoge numerosos ejemplos de documentos de patente publicados a nivel mundial relativos a la utilización de papel usado en la síntesis de biocombustibles y otros bioprecusores/ bioproductos. Haciendo doble click en el número de publicación puede accederse al texto completo en espacenet donde se describe detalladamente cada una de las invenciones.

**Tabla 1.** Documentos de patente

Nº Publicación	Solicitante (País)	Título
<a href="#">CN115304956A</a>	Bengbu Jinhuangshan Gravure Printing Co Ltd et al. (China)	Preparation method of waterborne polyurethane ink binder based on nanocellulose modification
<a href="#">KR20030047633A</a>	Choi Myung Bu et al. (Corea del Sur)	The manufacturing method of using wastepaper as wastewater absorbent
<a href="#">KR20210106735A</a>	GS Nanocell Co Ltd (Corea del Sur)	Production system for reinforced plastic composites using waste paper
<a href="#">CN102653776A</a>	Hitachi Shipbuilding Eng Co et al. (Japón)	Method for preparing ethanol via waste
<a href="#">CN108686628A</a>	Inst Chemical Ind Forest Products CAF (China)	Preparation method of waste paper based recoverable aerogel used for oil-water separation
<a href="#">WO2020118439A1</a>	Inst Nat Rech Scient (Canadá)	Production of polyhydroxyalcanoates from pulp and paper waste streams
<a href="#">MY178191A</a>	International Islamic Univ Malaysia (Malasia)	A method of producing sugar
<a href="#">WO2019022540A1</a>	KNU Industry Cooperation Found (Corea del Sur), Papiers Cartons et Celluloses (Francia)	Eco-friendly adsorption material for oil removal and preparation method therefor
<a href="#">US2022379286A1</a>	Korea Inst Sci & Tech (Corea del Sur)	Method for producing lactic acid from waste paper using lanthanide-based metal catalyst
<a href="#">KR20150130135A</a>	Lee Soo Hyung (Corea del Sur)	A preparation method of bio-ethanol using waste newspapers
<a href="#">JP2010041923A</a>	Oji Paper Co (Japón)	Enzymatic saccharification method and ethanol production method
<a href="#">JP2013090605A</a>	Panasonic Corp (Japón)	Production method of bioethanol, and production device
<a href="#">CN114156494A</a>	Quanzhou Teaching Univ (China)	Catalyst taking waste paper as carbon base and preparation method thereof
<a href="#">CN109694531A</a>	Shanghai Changfa New Mat Co Ltd (China)	PVC/paper waste micro-foamed composite profile and preparation method thereof
<a href="#">WO2022023686A1</a>	Suez Groupe (Francia)	Method for producing a sugar syrup from a residual lignocellulosic biomass
<a href="#">JP2005278602A</a>	Tsukishima Kikai Co (Japón)	Method for producing gluconic acid from waste paper
<a href="#">JP2002238590A</a>	Tsukishima Kikai Co (Japón)	Method for producing lactic acid
<a href="#">CN105862483A</a>	Univ Beifang Nationalities (China)	Preparation method of paper-cellulose viscose glue solution

Nº Publicación	Solicitante (País)	Título
<a href="#">CN114806198A</a>	Univ Chongqing Technology (China)	Modified asphalt doped with waste paper fibers and preparation method thereof
<a href="#">CN106520861A</a>	Univ Hebei Technol (China)	Method for preparing fermentable sugar from office paper
<a href="#">CN106947782A</a>	Univ Henan Agricultural (China)	Test method for photosynthetic hydrogen production by using office waste paper
<a href="#">CN112778554A</a>	Univ Hunan Science & Technology (China)	Method for preparing biodegradable transparent film from waste paper
<a href="#">KR20120052014A</a>	Univ Nat Chonnam Ind Found (Corea del Sur)	Process for the pre-treatment of waste paper to improve saccharification yield and process for the production of saccharides and bio-ethanol using the same
<a href="#">CN114853776A</a>	Univ North China Electric Power (China)	Method for high-value utilization of waste paper
<a href="#">CN110590962A</a>	Univ Shaanxi Science & Tech (China)	Method for preparing cellulose acetate by taking waste paper money as raw material
<a href="#">CN115161353A</a>	Univ Shanxi Agricultural (China)	Method and device for preparing olefin
<a href="#">CN101358213A</a>	Univ South China (China)	Method for producing energy ethanol by fermentation of waste paper pulp
<a href="#">AU2021107284A4</a>	Univ Qilu Technology (China)	A method of preparing efficient electromagnetic shielding aerogel from waste paper
<a href="#">CN108484962A</a>	Univ Xian Technology (China)	Method for preparing cellulose composite aerogel from waste paper
<a href="#">CN113136095A</a>	Univ Xian Technology (China)	Preparation method of waste paper fiber/nanocellulose reinforced polylactic acid-based composite material
<a href="#">CN115121226A</a>	Univ Xuzhou Medical (China)	Preparation method and application of magnetic carbon-based FeCo bimetal organic framework composite material
<a href="#">CN107915783A</a>	Univ Zhejiang Science & Tech; Hmei Machinery & Eng Co (China)	Method for preparing carboxymethyl cellulose by waste paper serving as raw material
<a href="#">CN101962469A</a>	Xingong Li (China)	Method for preparing full-degradable lactic acid composite material from secondary fibers of waste newspaper
<a href="#">JP2015204817A</a>	Yokohamashi Shigen Recycle Cooperative et al. (Japón)	Method for manufacturing ethanol
<a href="#">US2017306369A1</a>	Ylitalo Maxwell Robert (EE.UU.)	Method for surfactant enhanced enzymatic hydrolysis
<a href="#">KR20020096432A</a>	Yoon Hyon Hee (Corea del Sur)	A process for lactic acid production

# PATENTES BIOENERGÍA

Biocombustibles sólidos (pellets, biochars, bio RDFs, bio SRFs, etc.)		
Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2023100814</a> <a href="#">A1 20230608</a>	AIST et al. (JP)	<b>Solid biofuel from two-stage semi-carbonization step, and method for manufacturing same.</b> As a solid biofuel serving as an alternative or mix-in for coal coke, there is demand for a solid biofuel that has a high combustion ratio and is capable of long-term combustion and of maintaining form during combustion. This solid biofuel is obtained using a manufacturing method including: a first-stage step in which a raw material that has been chipped from a biomass resulting from photosynthesis is subjected to semi-carbonization to obtain a semi-carbonized raw material in which some of the moisture and volatile content of said raw material is released; and a second-stage step in which the semi-carbonized raw material is heated and pressed to obtain a consolidated molded article. Said solid biofuel has a fuel ratio exceeding 0.4 and a density of 1.0 g/cm <sup>3</sup> or greater, and can be used as a coal coke alternative and contribute to CO <sub>2</sub> reduction.
<a href="#">WO 2023084583</a> <a href="#">A1 20230519</a>	Chugoku Electric Power (JP)	<b>Solid biomass fuel production method.</b> Provided is a solid biomass fuel production method with which it is possible to omit a step for kneading mushroom compost, and to obtain excellent shapability. A solid biomass fuel production method that uses mushroom compost as raw material, the solid biomass fuel production method equipped with, in the following order: a classification step in which mushroom compost having a particle size of 5.8 mm or more is classified and removed; and a press shaping step. The mushroom compost contains corn cobs and the solid biomass fuel production method further includes a drying step in which the mushroom compost is dried, and the drying duration of the drying step is preferably 15 minutes or less.
<a href="#">WO 2023098945</a> <a href="#">A1 20230608</a>	Comasa GmbH (DE)	<b>Wood pellets and wood briquettes with reduced CO emission.</b> The present invention relates to wood pellets or wood briquettes, comprising 100 parts by weight of wood compound as a starting material for wood pellets or wood briquettes; and 0.001 to 2.00 parts by weight of preservative. The present invention further relates to methods for producing wood pellets or wood briquettes and to the use thereof.
<a href="#">EP 4186589 A1</a> <a href="#">20230531</a>	Commissariat Energie Atomique (FR)	<b>Plant and relative method for producing hydrophobic biomass pellets.</b> The invention essentially consists in adding, downstream of a biomass pelletization/granulation unit, a roasting oven which houses one or more conveying devices so that the biomass granules remain within the oven for a short and precise time in order to optimize their hydrophobicity.
<a href="#">EP 4183819 A1</a> <a href="#">20230524</a>	Commissariat Energie Atomique (FR)	<b>Method for treating biomass with a view to injecting same into a gasification reactor.</b> A method for treating biomass to manufacture biomass beads adapted to an implementation in a gasification method, the method comprising the following steps: a) providing a biomass powder, for example a wood bark powder, the particle size of the biomass powder preferably being less than 200 µm, b) providing an alginate solution comprising water and alginate, for example potassium alginate or sodium alginate, c) adding the biomass powder to the alginate solution and mixing, whereby a colloidal suspension is formed, d) dropwise adding the colloidal suspension to an ionotropic coagulation bath comprising multivalent ions, whereby biomass beads are formed.
<a href="#">EP 4159306 A1</a> <a href="#">20230405</a>	Cummins Inc (US)	<b>Solid bed level sensor for a biochar production system with a leveling actuator.</b> A biochar production system includes a reactor body, a central rod disposed within the reactor body, a leveling arm extending from the central rod and configured to rotate about the central rod, and a bed level sensor system. The bed level sensor system includes a float configured to move from a resting position on a biomass in the reactor to an ending position upon contact with the leveling arm, and a level sensor coupled to the float via a connector. The level sensor is configured to correspondingly move with the float. A controller is configured to detect bed levels of the biomass within the reactor body, and determine a plurality of sample readings based on the detected bed levels.
<a href="#">WO 2023079895</a> <a href="#">A1 20230511</a>	Japan Steel Works Ltd (JP)	<b>Die, granulation device, and method for producing organic composition pellets.</b> In a die, a plurality of nozzles each comprise a portion 52 that is provided with a nozzle opening diameter 52D, and a portion 53 that is between the portion 52 and an opening 32A, and has a nozzle opening diameter 53D which becomes narrower toward the portion 52. The plurality of nozzles 51 comprise an end nozzle 51E1 disposed at one end of an array of the plurality of nozzles 51 in a Z-direction, and a non-end nozzle 51M1 disposed next to the end nozzle 51E1 in the Z-direction. A length 52L of the portion 52 of the end nozzle 51E1 is shorter than a length 52L of the portion 52 of the non-end nozzle 51M1.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2023059005</a> <a href="#">A1 20230413</a>	Lee Woo Ho (KR)	<b>Apparatus for manufacturing solid fuel using waste nets.</b> The present invention relates to an apparatus for manufacturing a solid fuel using waste nets and may be configured to comprise: a sorting part that removes and sorts impurities from waste nets; at least one cutting part that cuts the waste nets sorted by the sorting part; a washing part for removing salt contained in the waste nets; a drying part that dries the moisture contained by the washing part; a heating part that heats the waste nets dried by the drying part to a set temperature; an extruding part that extrudes the waste nets heated by the heating part; and a molding part that cools the extruded waste nets and then mixes same with combustible wastes to mold into a solid fuel.
<a href="#">WO 2023074532</a> <a href="#">A1 20230504</a>	Univ Hokkaido Nat Univ Corp (JP)	<b>Conductive solid fuel, ignition device, method for producing same, ignition method and rocket combustion system.</b> An ignition device is provided with a housing, a bulk fuel, and at least two lead wires that serve as electrodes. The bulk fuel is formed of a plastic material such as a polylactic acid (PLA) and an epoxy resin. The bulk fuel contains a conductive substance in a powder form, the conductive substance being dispersed in the bulk fuel, thereby enabling the achievement of a conductive solid fuel. One end of each lead wire is partially buried in the bulk fuel. The other end of each lead wire is connected to a power supply (not shown in the drawing). Some of the bulk fuel is gasified by having a current passed through the lead wires, and a gasified fuel is combusted through a reaction with an oxidant OX. Due to this configuration, the present invention enables, with a simple structure, the achievement of ignition that is excellent in terms of reignition performance, safety management, heat management and reliability.
<a href="#">WO 2023105172</a> <a href="#">A1 20230615</a>	Univ Jean Monnet Saint Etienne et al. (FR)	<b>Process for the extrusion of wood pellets, co-rotating twin-screw extruder for the extrusion of wood pellets, and corresponding wood pellets.</b> The present invention relates to a process for the extrusion of wood pellets, comprising at least the steps of: (a) providing pieces of wood; (b) grinding and partially drying the pieces of wood in a twin-screw extruder comprising at least shear-generating elements, in order to obtain wood particles of which the water content is lower than that of the pieces of wood; (c) compressing the particles and shaping them in at least one die in order to obtain wood pellets. The invention also relates to wood pellets obtained by this process and to a co-rotating twin-screw extruder provided for the extrusion of wood pellets.

## Syngas

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2023064089</a> <a href="#">A1 20230420</a>	DG Fuels LLC (US)	<b>Processes and systems for producing hydrocarbon fuels having high carbon conversion efficiency.</b> The present disclosure relates to a processes and systems for producing fuels from biomass with high carbon conversion efficiency. The processes and systems described herein provide a highly efficient process for producing hydrocarbons from biomass with very low Green House Gas (GHG) emissions using a specific combination of components, process flows, and recycle streams. The processes and systems described herein provide a carbon conversion efficiency greater than 95 % with little to no GHG in the flue gas due to the novel arrangement of components and utilizes renewable energy to provide energy to some components. The system reuses water and carbon dioxide produced in the process flows and recycles naphtha and tail gas streams to other units in the system for additional conversion to syngas to produce hydrocarbon- based fuels.
<a href="#">WO 2023086012</a> <a href="#">A1 20230519</a>	Green Energy Invest Holding Pte Ltd (SG)	<b>Method and system for generating syngas.</b> Disclosed herein is a method for generating syngas comprising heating woodchips in a vessel comprising a pathway and a heat generator in thermal communication with the pathway to thermally degenerate the woodchips by pyrolysis with the woodchips forming biochar and releasing syngas when undergoing pyrolysis. The method further comprises displacing the generated syngas along the pathway to thereby filter the syngas through at least one of the woodchips and the biochar undergoing pyrolysis, and discharging the filtered syngas from the vessel.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">EP 4159831 A1</a> <a href="#">20230405</a>	RWE Generation NL BV (NL)	<b>Torrefaction unit and method.</b> The torrefaction unit comprises at least one multiple hearth furnace which is heated by a heat transfer fluid comprising hot water taken form a water space of a steam drum. The heat transfer fluid is guided through a water circuit to a heating system of the at least one multiple hearth furnace. This means the multiple hearth furnace is heated to a torrefaction temperature indirectly by the use of hot water as heat transfer fluid. This is environmentally advantageous. The torrefaction gas created by the torrefaction of material comprising biomass such as municipal solid waste is preferably partially oxidized in a partial oxidation reactor for creating syngas. Preferably, a part of the thermal energy of the syngas is used in an evaporator and/or a superheater to heat water and/or steam and/or to evaporate water. The evaporated water is preferably guided to a steam space of the steam drum and can, thus, be used to heat the heat transfer fluid. The partial oxidation reactor and the temperature of the heat transfer fluid can be controlled independently allowing to one single partial oxidation reactor for at least two multiple hearth furnaces.
<a href="#">WO 2023077097</a> <a href="#">A1 20230504</a>	Simonpietri Marie Joelle et al. (US)	<b>Processing and gasification of construction and demolition materials.</b> Methods and systems for processing construction and demolition (C&D) materials to produce a product gas stream and/or electricity are disclosed herein. In some embodiments, the method comprises pre-processing C&D materials to produce a C&D feed, and processing the C&D feed to produce syngas. The C&D feed can comprise untreated wood, treated wood, paper and cardboard, yard waste, plastic, rubber, and/or foam. Processing the C&D feed can comprise gasifying the C&D feed, steam, and oxygen in a gasifier at a temperature of no more than 950°C and/or a pressure of no more than 200 psi to produce syngas.

## Biogás

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2023104815</a> <a href="#">A1 20230615</a>	Air Liquide (FR)	<b>Facility for producing liquid CO2 and biomethane with a means for preventing the build-up od hydrogen and oxygen.</b> The invention relates to a facility for producing liquid CO2 and biomethane, comprising :- a unit for producing biogas;- at least one unit for the membrane separation of biogas to produce biomethane and a gaseous mixture M1 mainly comprising carbon dioxide;- a unit for cryogenically distilling the gaseous mixture M1 to produce liquid CO2 and a gaseous mixture M2 comprising carbon dioxide, methane, oxygen and hydrogen; - one or more membranes located in the flow of the gaseous mixture M2 to separate the methane from the oxygen-hydrogen mixture contained in the gaseous mixture M2; - a means for recirculating the methane originating from the gaseous mixture M2 to the membrane separation unit; and - a vent for removing the oxygen-hydrogen mixture originating from the gaseous mixture M2.
<a href="#">EP 4190435 A1</a> <a href="#">20230607</a>	Biogas Eng Srl (IT)	<b>A mixer for biogas fermenters, and method for the assembly thereof.</b> A mixer for biogas fermenters, adapted to stir a fermenting material, comprises a shaft, rotatable about an axis of rotation (x); a stirring element, comprising an attachment portion welded to the shaft; and a pair of projections, protruding radially from the shaft and spaced angularly from respective circumferential ends of the attachment portion, so as to form a stop against which these ends abut when the attachment portion becomes deformed and/or slides angularly with respect to the shaft due to the resistance opposed by the fermenting material to the rotation of the mixer.
<a href="#">WO 2023084215</a> <a href="#">A2 20230519</a>	Egge Ltd (GB)	<b>Processing hub for an energy capture and utilisation system, system, and apparatus therefor.</b> The invention provides a processing hub for an energy capture and utilisation system. The processing hub is arranged at a processing location and comprises a waste material processing module operable to generate biogas from input waste material at the processing location. The hub comprises an electric power generator module operable to generate electric power from biogas fuel at the processing location, and at least one electric power storage unit comprising one or more battery cells chargeable by the electric power generator module. An electric vehicle charging module is operable to charge an electric vehicle from electric power generated from the electric power generator module.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">EP 4166514 A1</a> <a href="#">20230419</a>	FCC Aqualia SA (ES)	<b>Combined UASB reactor-solids anaerobic digester device and method for treating unsettled sewage.</b> The present invention relates to a one-stage device for treating wastewater, such as unsettled sewage, specially wastewater having sub-mesophilic temperatures and/or showing high fluctuations of temperatures over the year, the device being essentially made of a combination of a pulsating UASB reactor with a non-heated solids anaerobic digester located below the UASB reactor, comprising a baffle sloping partition element connecting both chambers; in such a way that the sludge produced during the process inside the UASB reactor is settled downwards to the digester, recycled and sent to the UASB reactor by a gas-lift pump that operates with the biogas generated in the anaerobic digester. The UASB reactor comprises a mixing and injecting device of wastewater that works by pulses, and that not only feeds and mixes the reactor, but it also mixes the sludge bed of the digester, in different operational modes. The invention also discloses the method for treating wastewater.
<a href="#">EP 4183473 A1</a> <a href="#">20230524</a>	Institut Nat des Sciences Appliquees de Toulouse et al. (FR)	<b>Device and method for separating two gaseous components such as methane and carbon dioxide contained in a biogas.</b> The invention relates to a device for the separation of methane and carbon dioxide contained in a biogas resulting from anaerobic digestion. The device comprises a washing column (CL) by liquid-gas absorption and a regeneration circuit with a static mixer (MS). The device comprises between the outlet of the washing column (CL) and the static mixer (MS) a regulator (GLCC) with a cylindrical separator of the cyclone type, the gas outlet of said regulator (GLCC) being sent with the biogas, at the inlet of the washing column (CL), the regeneration circuit comprising a separation tank at the outlet of the static mixer, characterized in that the said regeneration circuit further comprises a vacuum pump (PV) for the evacuation of the CO2 separated from the liquid regenerated in a separation tank (CS) at the outlet of the static mixer (MS).
<a href="#">WO 2023093963 A1</a> <a href="#">20230601</a>	Nature Energy Biogas AS (DK)	<b>Method for producing product gas comprising methane.</b> A method for producing product gas (PG) comprising methane is disclosed, the method comprising the steps of providing a biomass (BM), subjecting the biomass (BM) to an anaerobic digestion to produce biogas (BG) and a biomass digestate (BMD), separating the biomass digestate (BMD) into a liquid digestate fraction (LDF) and a solid digestate fraction (SDF), and subjecting the liquid digestate fraction to microbial electrolysis cell (MEC) processing to produce methane and/or hydrogen gas. Also, a system for producing product gas (PG) comprising methane is disclosed.
<a href="#">WO 2023081780 A1</a> <a href="#">20230511</a>	South Dakota Board of Regents (US)	<b>Anaerobic bioreactor with electrolytic regeneration for wastewater treatment.</b> An anaerobic bioreactor with electrolytic regeneration system, method and apparatus for monitoring pH levels which is simultaneously efficient in both anaerobic digestion and optimized filtration process is disclosed. To maintain the pH stability of an anaerobic bioreactor, an electrolysis process is integrated with the bioreactor. The integration of an electrolysis process with the bioreactor sustains the pH in the optimized range for anaerobic process while enhancing the removal of contaminants in the bioreactor, augmenting biogas production, and mitigating fouling.
<a href="#">WO 2023067162 A1</a> <a href="#">20230427</a>	Steinecker GmbH (DE)	<b>Brewery operating method and brewery with biogas recovery.</b> A method for operating a brewery and such a brewery are described, where brewing residues obtained, comprising spent grains and wastewater, are subjected to biomass conversion through proteolysis in a first converter stage, with deposition of protein hydrolysate; by acidification and especially ion exchange in a second converter stage, with deposition of mineral fertilizer; and through biogas fermentation to recover biogas especially in conjunction with processing of wastewater to process water in a third converter stage, and where the biogas is at least partly fired to supply the brewery with power and/or heat. As a result it is possible to process biomass contained in the spent grains and in the wastewater jointly and to utilize it with unexpectedly high methane yield.
<a href="#">WO 2023052624 A1</a> <a href="#">20230406</a>	Sublime Energie (FR)	<b>Method for separating all or some of the compounds from a biogas in the liquid state or in the two-phase state.</b> The invention relates to a method for separating all or some of the compounds from a biogas in the liquid state or in the two-phase liquid/vapour state containing methane, CO2 and optionally a hydrocarbon or a mixture of hydrocarbons from the C3 to C7 family, wherein the methane is separated from the other compounds by cryogenic distillation by injecting, into a distillation column, the liquefied biogas at an equilibrium temperature which makes it possible to obtain a two-phase mixture, ensuring the separation of the different compounds, and a liquefying agent, in the liquid state, composed of a hydrocarbon or a mixture of hydrocarbon(s) from the C3 to C7 family, the liquefying agent being injected at the top of the column, above the biogas inlet, at a temperature lower than or equal to the CO2 desublimation temperature at a given pressure of the column and in an amount proportional to the vapour flow rate of the CO2 ascending at the top of the column.



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<a href="#">EP 4166215 A1</a> <a href="#">20230419</a>	TotalEnergies OneTech (FR)	<b>A carbon dioxide removal installation and associated method.</b> The invention relates to a carbon dioxide removal installation comprising:- a bio-energy unit adapted to be supplied with a quantity of biomass and/or of biofuel and/or biogas, and to produce a flue gas stream from a combustion of the quantity of biomass and/or of biofuel and/or of biogas, the flue gas stream comprising carbon dioxide,- a single carbon capture unit adapted to collect both at least a part of the flue gas stream produced by the bio-energy unit and an air stream from atmosphere, said air stream comprising carbon dioxide, the carbon capture unit being adapted to produce a carbon concentrated stream of carbon dioxide from said flue gas stream and air stream,- a processing unit adapted to process the carbon concentrated stream of carbon dioxide.

## Bioalcoholes (bioetanol, biometanol, etc.)

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2023076589</a> <a href="#">A1 20230504</a>	Alliance Sustainable Energy (US)	<b>Pretreatment of lignocellulose using two stage alkali and mechanical refining processes.</b> Disclosed herein are processes for ethanol production from a lignocellulosic feedstock. These processes provide DMR of lignocellulosic biomass comprising two-stage deacetylation followed by mechanical refining so as to increase fermentable sugar yield while reducing hydrolytic enzyme loading requirements.
<a href="#">WO 2023110526</a> <a href="#">A1 20230622</a>	Casale SA (CH)	<b>Methanol from biomass gasification.</b> Process (100) for the synthesis of methanol (1) comprising the steps of: subjecting a biomass (2) to a gasification process (6) in presence of steam (5) and an oxidant (48); subjecting the so obtained gasifier stream (7) to water gas shift conversion (10) and purification (14) to yield a synthesis gas (15) with hydrogen, carbon monoxide and CO <sub>2</sub> ; mixing said synthesis gas (15) with a second stream of synthesis gas (31) to yield a third stream of synthesis gas (16); feeding said third stream of synthesis gas (16) to a methanol synthesis loop (19) wherein a crude methanol (20) and a tail gas (35) retaining methane are produced; subjecting said tail gas (35) to a reforming step (25) in presence of an oxidant (49) to generate said second stream of synthesis gas (31).
<a href="#">WO 2023084321</a> <a href="#">A1 20230519</a>	Chatterjee Tapas (IN)	<b>Process and system for preparing three or more value added products from biomass.</b> The present invention provides a process and a system for recovering three or more valuable products from biomass, wherein the valuable products are selected from a group comprising cellulose, silica, lignin, ethanol and cattle feed. In particular, the present invention provides a process and a system for recovering four or more valuable products from biomass, wherein the valuable products are selected from a group comprising cellulose, silica, lignin, ethanol and cattle feed. In a more preferred aspect, the invention provides a process and a system for recovering all of cellulose, silica, lignin, ethanol and cattle feed from biomass.
<a href="#">WO 2023076323</a> <a href="#">A1 20230504</a>	Danisco US Inc (US)	<b>Reduction in acetate produced by yeast with reduced expression of RSF2 OR TDA9.</b> Described are compositions and methods relating to modified yeast with disrupted RSF2 or TDA9 genes. The yeast produces a decreased amount of acetate compared to otherwise identical parental cells. Such yeast is particularly useful for large-scale ethanol production from starch substrates where acetate is an undesirable end product.
<a href="#">WO 2023079048</a> <a href="#">A1 20230511</a>	DSM IP Assets BV (NL)	<b>Process for the production of ethanol and recombinant yeast cell.</b> A process for the production of ethanol, comprising: fermentation of a feed, under anaerobic conditions, wherein the feed contains a di-saccharide, oligo-saccharide and/or poly-saccharide and wherein the fermentation is carried out in the presence of a recombinant yeast cell, which recombinant yeast produces a combination of proteins having glucosidase activity; and recovery of ethanol, and a recombinant yeast cell for use therein.
<a href="#">US 2023127442 A1</a> <a href="#">20230427</a>	Kemin Ind Inc (US)	<b>Compositions for increasing ethanol production and related methods.</b> The present invention relates to methods and compositions capable of counteracting heat and ethanol stress to yeast during an ethanol production process. Another aspect of the present invention relates to methods for increasing ethanol production yield by at least 0.5%. Other aspects of the present invention relate to supporting yeast during a fermentation process and reducing overall input costs for ethanol production.



Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2023062542</a> <a href="#">A2 20230420</a>	Lallemand Hungary Liquidity Man LLC (HU)	<b>Recombinant yeast cell having increased pyruvate decarboxylase activity.</b> The present disclosure provides a recombinant yeast cell for making ethanol. The recombinant yeast cell comprises a first genetic modification to increase an ethanol yield in the recombinant yeast cell when compared to a parental yeast cell. The recombinant yeast cell also comprises a second genetic modification capable of increasing pyruvate decarboxylase activity in the recombinant yeast cell when compared to the parental yeast cell. The parental yeast cell lacks the first genetic modification and the second genetic modification. The present disclosure also provides methods for making the recombinant yeast cell as well processes for using the recombinant yeast cell to make ethanol.
<a href="#">US 2023138705 A1</a> <a href="#">20230504</a>	LUCASE3 LLC (US)	<b>Ethanol production system and method.</b> A system and method for producing ethanol from dry-milled corn or other grains includes the steps of separating fiber components and embedded starch components from the grain. The fiber components and embedded starch components are cooked at high temperatures and fermented to produce ethanol.
<a href="#">WO 2023073167</a> <a href="#">A1 20230504</a>	Novamont Spa (IT)	<b>Process for the recovery of second-generation sugars.</b> The present invention relates to a process for the production of second-generation sugars from waste fruit and/or fruit processing waste, the monosaccharide composition obtained therefrom and its use as a component of the culture medium in fermentation processes for the production of dialcohols, monoalcohols, hydroxy acids, diacids or amino acids. The process involves the separation of an insoluble residue and an aqueous solution from an aqueous suspension of said waste, enzyme hydrolysis of the oligosaccharides present in the aqueous solution or in the aqueous suspension and the removal through alcohol precipitation of high molecular weight saccharide compounds from the aqueous solution.
<a href="#">WO 2023079455</a> <a href="#">A1 20230511</a>	Versalis Spa (IT)	<b>Integrated process for the production of polyhydroxyalkanoates and bioethanol from lignocellulose hydrolyzate.</b> Integrated process for the production of polyhydroxyalkanoates (PHAs) and bioethanol from lignocellulosic hydrolyzate comprising the following steps: (a) feeding at least a part of said lignocellulosic hydrolyzate to a first fermentation device in the presence of at least one microorganism capable of using sugars with six carbon atoms (C6) and organic acids, obtaining a first fermentation broth; (b) subjecting the first fermentation broth obtained in said step (a) to separation obtaining an aqueous suspension of cellular biomass comprising at least one polyhydroxyalkanoate (PHA) and an aqueous phase comprising sugars with five carbon atoms (C5) in a quantity greater than or equal to 10 g/L, preferably between 12 g/L and 100 g/L; (c) optionally, feeding at least a part of the aqueous phase obtained in said step (b), to a second fermentation device in the presence of at least one microorganism capable of using both sugars with five carbon atoms (C5) and sugars with six carbon atoms (C6), obtaining a second fermentation broth (inoculum); (d) feeding at least a part of the aqueous phase obtained in said step (b) and, optionally, the second fermentation broth (inoculum) obtained in said step (c) and/or at least a part of said lignocellulosic hydrolyzate, to a third fermentation device in the presence of at least one microorganism capable of using both sugars with five carbon atoms (C5) and sugars with six carbon atoms (C6), obtaining a third fermentation broth; (e) subjecting said third fermentation broth to separation obtaining bioethanol. The aforementioned polyhydroxyalkanoates (PHAs) can be advantageously used in various applications, in particular in the medical, pharmacological, agricultural, engineering and food fields. The aforementioned bioethanol can be advantageously used as it is, or mixed with fossil fuels, for automotive purposes, or, suitably purified, in the production of biochemicals (for example, disinfectants).

## Biodiésel

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">EP 4198136 A2</a> <a href="#">20230621</a>	Indian Oil Corp Ltd et al. (IN)	<b>Methods and formulations for enhancing high value lipids.</b> The present invention provides a method for the simultaneous enhancement in biomass and lipids containing omega-3-fatty acids of Thraustochytrid microalgae in a single step using synergistic effect of chemical mixture in appropriate proportion in production medium. The process discloses enriching the biomass of microalgae with high value lipids by subjecting the microalgal cells in growth medium supplemented with unique combination of chemical modulators and carbon substrates in the presence of nitrogen. The present invention also provides a novel strain Schizochytrium sp. (MTCC 5980) for use in continuous aerobic fermentative lipid production process for enhancing high value lipids like Docosahexaenoic acid (DHA), Docasapentaenoic acid (DPA), Eicosapentaenoic acid (EPA) and lipids for biodiesel.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">MX 2019014230 A</a> <a href="#">20210531</a>	Inst Politecnico Nacional (MX)	<b>Process for producing biodiesel through cao/sba-15 type catalysts.</b> The present invention relates to the area of ??chemical catalysis, which is a process for the production of biodiesel, comprising a synthesis step of catalysts of the CaO/SBA-15 type. Said catalysts improve the activity, selectivity, and stability, thus avoiding the problem of catalyst leaching. Also, it includes the optimal conditions for obtaining biodiesel of optimum quality from the seeds of J. Curcas, a plant for non-human consumption. Herein, the requirements of the preferred modality are 80°C, 1% by mass of SBA-50 catalyst, and a molar ratio of oil to alcohol is 12: 1.
<a href="#">KR 20230045219 A</a> <a href="#">20230404</a>	Kyungpook Nat Univ Ind Academic Coop Found (KR)	<b>New green algae originating from ulleungdo and biodiesel production method using the same.</b> The present invention relates to a novel green algae derived from Ulleungdo and a biodiesel production method using the same, according to the present invention]], KNUA107 (Accession No. KCTC 14645BP) was cultured in BG-11 medium supplemented with glucose under mixed nutrient culture conditions. FAME extracted from the produced biomass can be used as a raw material for high-quality biodiesel due to its high content of saturated fatty acids and monounsaturated fatty acids.
<a href="#">US 2023114439 A1</a> <a href="#">20230413</a>	Marathon Petroleum Co LP (US)	<b>Systems and methods of converting renewable feedstocks into intermediate hydrocarbon blend stocks and transportation fuels.</b> Systems and methods to provide renewable transportation fuels for internal combustion engines by converting renewable feedstocks into two or more intermediate hydrocarbon blend stocks and blending at least two of the two or more intermediate hydrocarbon blend stocks to produce the renewable transportation fuel. Methods and/or processes may include selecting sugar from a sugar source and introducing the sugar into one or more reactors. The sugar may be converted into an intermediate renewable hydrocarbon blend stock and sent to a separation unit to separate out an intermediate renewable gasoline unit. The process may include selecting and converting a lipid from a lipid source into a renewable diesel product. The renewable diesel product may be sent to a second separation unit to separate out renewable diesel and a low-grade naphtha. The low-grade naphtha and intermediate renewable gasoline may be blended to define a finished renewable gasoline.
<a href="#">CN 115873907 A</a> <a href="#">20230331</a>	Shanghai Zhongqi Environment Tech Co Ltd (CN)	<b>Method for preparing biodiesel through lipase catalysis.</b> The invention discloses a method for preparing biodiesel through lipase catalysis, and relates to the field of biodiesel, and a biodiesel enzymatic reaction process comprises the steps of raw oil pretreatment, enzymatic transesterification reaction, deacidification treatment and fatty acid salt modification. The deacidification treatment comprises the following steps: further removing moisture from the obtained crude biodiesel through an oil-water separator, introducing the dehydrated crude biodiesel into a reactor containing a low-concentration potassium hydroxide methanol solution, and carrying out deacidification reaction for multiple times, so as to obtain deacidified biodiesel after the reaction is finished; methacrylic anhydride and tert-butylhydroquinone are subjected to an esterification reaction, the synthesized product is subjected to a halogenation reaction through copper chloride, the generated product is used for modifying fatty acid salt in the biodiesel subjected to deacidification treatment, and the biodiesel is obtained. The method has the effects of reducing the acidity of the biodiesel, avoiding saponification reaction, improving the demulsification capability and reducing the condensation point.
<a href="#">BR 102021018179 A2</a> <a href="#">20230328</a>	Univ Federal de Campina Grande PB (BR)	<b>Combustion reaction synthesis of MoO<sub>3</sub> for use as a heterogeneous catalyst.</b> The present invention provides a method for the pilot scale production by combustion reaction of catalysts based on MoO <sub>3</sub> (molybdenum trioxide), for application in the production of biodiesel. More specifically, the present invention deals with the use of the combustion reaction method for catalyst synthesis, since it enables, in addition to temperature control, high chemical homogeneity and high purity, being a versatile and fast synthesis method. The biodiesel obtained catalyzed by the proposed product was promising and showed ester conversions ranging from 94-99%, so it is evident that the invention has potential applicability in the field of catalysis for biodiesel production.

## Bio-jet fuels

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">BR 102021021473 A2 20230509</a>	Univ Minas Gerais (BR)	<b>Compact plant for continuous synthesis of biodiesel in supercritical medium.</b> The present technology deals with a compact plant for continuous synthesis of biodiesel in supercritical medium. The device has dimensions that allow it to be installed, transported and operated in a truck body. However, there are no impediments for the plant to be dimensioned for larger areas. The plant can assume three different configurations, non-limiting, of construction and assembly: configuration for biodiesel synthesis in two sequential steps, configuration for synthesis containing two independent and parallel lines in only one reaction step and configuration for biodiesel synthesis in only one line and reaction step. In addition, the plant features a three-stage heating mechanism, tubular reactors in turns and a distillation system, which contribute to a final yield of 97% in biodiesel content. The portable configuration of the plant makes it possible to assemble production units in different locations, providing decentralized production, as well as being an alternative for the development of research into the synthesis of biodiesel and other biofuels.
<a href="#">CN 116120986 A 20230516</a>	- (CN)	<b>A kind of coupling process for making biodiesel from waste oil and grease.</b> The invention discloses a coupling process for producing biodiesel from waste oil, which comprises the following steps: 1) removing solid impurities from waste oil and mixing it with alcohol and a liquid acid catalyst to carry out pre-esterification reaction to generate a pre-esterification mixture; 2) making the pre-esterification mixture The esterification mixture is mixed with water and passed into the liquid-liquid separator, and the water phase is separated to remove metal ions to obtain the esterification product II; 3) The esterification product II is mixed with the vulcanizing agent and H <sub>2</sub> ; Hydrogen reaction to produce product I; 4) After the product I is separated from the oil phase, it is mixed with H <sub>2</sub> ; and passed into the fixed bed reactor, and separated by a gas-liquid separator to obtain the oil phase product II; 5) The oil phase product II and hydrogen are passed into the hydroisomerization reactor to react to form product II; 6) The product II is passed into the gas-liquid separator, and the separated liquid phase product is passed into the fractionation tower to separate the biodiesel product. The production process of the invention is stable and reliable, and the raw materials are highly adaptable, and raw materials such as catalyst and excess hydrogen can be recycled in the production process, so as to ensure long-term operation of the system.
<a href="#">CN 116036998 A 20230502</a>	- (CN)	<b>A kind of reaction device and method for producing biodiesel by ester exchange method.</b> The invention discloses a reaction device and method for producing biodiesel by transesterification. The reaction device comprises a microchannel mixing device I, a microchannel mixing device II and a transesterification reactor. The transesterification reaction method is as follows: the mixture material I of low-carbon alcohol and triglyceride with a molar ratio $\geq 3:1$ enters from the feed port of the transesterification reactor as the main reaction material, and the low-carbon alcohol and triglyceride The acid ester is introduced into the transesterification reactor with a molar ratio $<3:1$ of the mixed material II as an enhanced mass transfer material, and the mixed material I and II undergo efficient transesterification in the reactor. The present invention strengthens the mass transfer in the entire transesterification reaction process by improving the mixing state of triglycerides and low-carbon alcohols and the mixed feeding mode, and improves the mass-transfer reaction rate and the single-pass conversion rate of raw materials between esters and low-carbon alcohols that are not easily miscible. , shorten the reaction residence time, and improve the production efficiency of transesterification biodiesel.
<a href="#">CN 115895786 A 20230404</a>	- (CN)	<b>A method of making biodiesel from driving rain oil.</b> The invention relates to a method for producing biodiesel from hogwash oil, which comprises the following steps: pre-esterification, pumping hogwash oil into a pre-esterification kettle to raise the temperature to 40-60°C, adding sulfuric acid methanol solution, stirring for reaction, standing still for sedimentation, and separating Take out the acid water in the lower layer; extract, transfer the raw material oil in step S1 to the extraction kettle, heat up to 40-50°C, add methanol to stir, let it settle, the upper layer is methanol, and the lower layer of raw oil is introduced into the transesterification kettle; transesterification , heat the raw material oil in the transesterification tank to 80-90°C, add sodium hydroxide methanol solution to react for 30 minutes, and obtain biodiesel fatty acid methyl ester; separate, heat up to 120°C after transesterification to demethanol, after demethanol, the crude The methyl ester is separated by standing and settling, the lower layer is a glycerin mixture, and the upper layer biodiesel fatty acid methyl ester enters a distillation and refining process to obtain refined biodiesel. The invention aims to provide a method for producing biodiesel from hogwash oil, which can not only be produced in a systematic, standardized and large-scale manner, but also fully utilize waste water and additives in production.

## Bio-jet fuels

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">US 2023193148 A1</a> <a href="#">20230622</a>	Battelle Memorial Inst (US)	<b>Method embodiments for partial hydrogenation of carbocyclic compounds to produce jet fuel blendstock.</b> Disclosed herein are embodiments of a method for making jet fuel blendstocks that comprise partially hydrogenated carbocyclic compounds and which can be used to replace aromatic-containing fuels and that exhibit suitable seal swell properties. The disclosed method embodiments utilize catalysts and reaction conditions that facilitate partially hydrogenating carbocyclic compounds present in mixtures obtained from renewable sources, such as bio-based fermentation products. The reaction product mixtures obtained from the disclosed method can be blended with blendstocks to provide fuels that avoid soot formation caused by aromatic-containing fuels and that exhibit seal swelling that meet requirements in aviation systems.
<a href="#">WO 2023084092</a> <a href="#">A1 20230519</a>	Compania Espanola de Petroleos SAU (ES)	<b>Process for upgrading an oxygenate feedstock into hydrocarbon fractions and other applications.</b> The present disclosure relates to a process plant and a process for production of a n- paraffinic hydrocarbon fraction from an oxygenate feedstock such as a renewable feedstock, comprising the steps of hydrodeoxygenation of the feedstock followed by fractionation of the product thus obtained to provide at least two fractions, wherein the heavy fraction is recycled to an hydrocracking reactor positioned downstream the fractionation section and a lighter fraction is separated to provide the n-paraffinic rich hydrocarbon fraction of a defined carbon range. Optionally, other hydrocarbon fractions obtainable by the provided process and plant may be further transformed into jet fuel or other valuable products.
<a href="#">US 2023103331</a> <a href="#">A1 20230406</a>	Exxonmobil Technology & Engineering Company (US)	<b>Catalyst configuration for renewable jet production.</b> This application relates to methods and systems that utilize catalytic methods to produce jet fuel such as hydrocarbons with carbons numbers from C9 to C16. Disclosed herein is an example method of producing renewable jet fuel. Examples embodiments of the method include hydrocracking a biofeedstock by reaction with hydrogen in the presence of a hydrocracking catalyst to form a hydrocracked biofeedstock. Examples embodiments of the method further include isomerizing at least a portion of the hydrocracked biofeedstock in the presence of a dewaxing catalyst to form a dewaxed effluent. Examples embodiments of the method further include separating the dewaxed effluent to form a renewable jet fuel product.
<a href="#">US 2023136255 A1</a> <a href="#">20230504</a>	Exxonmobil Technology & Engineering Company (US)	<b>High yield jet fuel and chemicals from ozonolysis of triglycerides.</b> A method for producing jet range hydrocarbons may include reacting at least a portion a fatty acid stream comprising C18:1 free fatty acid with ozone in an ozonolysis unit to form at least a C18:1 ozonide intermediate; introducing the C18:1 ozonide intermediate into a reactor, wherein at least a portion of the C18:1 ozonide intermediate is reacted with a reductive agent to produce oxidized products comprising azelaic acid and nonanoic acid; and introducing the oxidized products into a hydrotreating unit, wherein at least a portion of the oxidized products is hydrotreated to produce a paraffin product comprising nonane.
<a href="#">WO 2023088772</a> <a href="#">A1 20230525</a>	IFP Energies Now (FR)	<b>Renewable jet production from catalytic pyrolysis feedstock.</b> The present invention provides a process comprising preparing renewable jet fuel blendstock by: a. feeding biomass, catalyst, and optionally transport fluid to a catalytic pyrolysis process fluidized bed reactor maintained at reaction conditions to manufacture a raw fluid product stream containing renewable aromatics, b. feeding the raw fluid product stream of a) to a solids separation and stripping system to produce separated solids and a fluid product stream, c. feeding the fluid product stream of b) to a fractionation system in order to recover a fraction boiling at 180 °C to 300°C, d. hydrogenating at least a portion of the fraction generated in c) with hydrogen at hydrogenation conditions to produce a hydrogenated fraction containing naphthenes, suitable as jet fuel blendstock, e. optionally recovering the jet fuel blendstock comprising naphthenes from the hydrogenated fraction of d) in a product recovery system.
<a href="#">WO 2023085337</a> <a href="#">A1 20230519</a>	National Univ Corp et al. (JP)	<b>Bio-jet fuel production method and bio-jet fuel production catalyst used in said method.</b> In order to provide a bio-jet fuel production method that enables production of a high quality bio-jet fuel easily while achieving a high level of energy saving, and provide a bio-jet fuel production catalyst used in said method, the present invention comprises a property modification treatment step for, to obtain a bio-jet fuel from a biomass resource, conducting decarbonation, hydrogenation, isomerization, and degradation of a biomass-derived oil containing free fatty acids, hydrocarbons, and triacyl glycerol under a condition with a reaction temperature of 200-450°C by using a catalyst obtained by supporting a solid acid catalyst on a solid base catalyst.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">DE 102022132376 A1 20230607</a>	Petroleo Brasileiro (BR)	<b>Process for the production of aviation paraffin from a renewable source stream rich in aromatic compounds.</b> The present invention refers to the processing of a 100% renewable load in FCC units, wherein the load comprises triglycerides of vegetable and animal source, free fatty acids, fatty acid esters, ketones, alcohols and long-chain aldehydes, using catalyst and appropriate operating conditions in order to obtain 100% renewable products with a high content of aromatic compounds, in the range of naphtha, kerosene, diesel and heavy gas oil. The product thus obtained complies with all the properties of the ASTM D1655 standard, even for contents of up to 10% renewable content. In addition, there is no need to reduce the freezing point of the fossil QAV for the introduction of the renewable component, with no impact on the yield and economy of the process.
<a href="#">WO 2023066738 A1 20230427</a>	Shell Int Research (NL) et al.	<b>Aviation fuel composition.</b> This invention provides an aviation fuel composition comprising: a cycloparaffinic kerosene generated from hydrolysis and hydroconversion of a solid biomass containing lignocellulose, wherein the cycloparaffinic kerosene comprises at least 90 vol% cycloparaffins and less than 1 vol% aromatics; a paraffinic-based kerosene comprising normal and iso-paraffins in an amount of greater than 95%; and optionally, a petroleum-derived kerosene. The aviation fuel composition of the present invention provides an environmentally-friendly fuel while providing improved lubricity and low temperature viscosity properties.
<a href="#">US 2023193143 A1 20230622</a>	UOP LLC (US)	<b>Process for producing jet fuel from isomerizing a biorenewable feed.</b> A new catalyst hydroisomerizes C18 paraffins from fatty acids to a high degree to produce a composition with acceptable freeze point which retains 18 carbon atoms in the hydrocarbon molecule for jet fuel. We have discovered a fuel composition comprising at least 14 wt % hydrocarbon molecules having at least 18 carbon atoms and a freeze point not higher than -40° C. The composition also may exhibit a final boiling point of no more than 300° C. The hydroisomerization process can be once through or a portion of the product diesel stream may be selectively hydrocracked or recycled to hydroisomerization to obtain a fuel composition that meets jet fuel specifications.
<a href="#">CN 115960639 A 20230414</a>	- (CN)	<b>A kind of jet fuel and its preparation method.</b> The disclosure relates to a jet fuel and a preparation method thereof. The jet fuel includes: biomass-based jet fuel, petroleum-based jet fuel and additives, wherein the biomass-based jet fuel includes C8-C15 paraffins, the distillation range of which is 140-260°C, and based on the total weight of the biomass-based jet fuel, the content of components within the distillation range of 170-240°C is 50-98wt%. The jet fuel contains biomass-based jet fuel. Compared with petroleum-based jet fuel, biomass-based jet fuel has more excellent thermal stability and lower sulfur and nitrogen content. Therefore, the thermal stability of the jet fuel of the present disclosure Better performance, and lower sulfur and nitrogen content.

## Biohidrógeno

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">DE 102021129804 A1 20230517</a>	Hites Holding GmbH (DE)	<b>Method and apparatus for producing hydrogen.</b> Process for converting carbon-containing raw materials and in particular biomass into hydrogen, comprising the steps: gasification of the carbon-containing raw materials (2) in a gasifier (1), with heated steam being introduced into the gasifier (1) and used for gasification; purification of the hydrogen-containing synthesis gas produced during the gasification, the gasification being an allothermic gasification and the heated steam being used both as a gasification medium and as a heat transfer medium for the gasification, characterized in that energy not used for the H2 production is at least partially used for the production and/or overheating of water vapor is reused.
<a href="#">DE 102021129812 A1 20230517</a>	Hites Holding GmbH (DE)	<b>Method and apparatus for producing hydrogen.</b> The invention relates to a method for operating an apparatus (200) for converting carbon-containing raw materials and in particular biomass into hydrogen, wherein, in an operating mode of the apparatus (200), the following steps are performed: gasifying the carbon-containing raw materials (2) in a gasifier (1), heated steam being introduced into the gasifier (1) and being used for the gasification; purifying the hydrogen-containing synthesis gas produced during the gasification, the gasification preferably being an allothermal gasification and the heated steam being used both as a gasification agent and as a heat-transfer medium for the gasification, characterised in that, in a cleaning mode of the apparatus (200), components of the apparatus (200) and in particular at least of the gasifier are cleaned, these components being cleaned with a flowable cleaning medium and in particular with steam as part of this cleaning process.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">CN 115873906 A</a> <a href="#">20230331</a>	Inst Process Eng CAS (CN)	<b>Method for co-producing hydrogen and butanol from garbage.</b> The invention discloses a method for co-production of hydrogen and butanol from garbage, and relates to the technical field of biochemical engineering. The method comprises the following steps: adding precursor substances of NADH (nicotinamide adenine dinucleotide) and NADPH (nicotinamide adenine dinucleotide phosphate) and amylase catalysis dependent metal ions into a fermentation system, and carrying out anaerobic saccharification and fermentation to realize co-production of hydrogen and butanol from garbage; the fermentation system comprises a fermentation strain, a strain culture medium and a garbage substrate; the fermentation strain is clostridium. The method provided by the invention realizes efficient and green co-production of hydrogen and butanol from organic solid wastes, and provides technical support for industrial conversion of hydrogen and butanol biological energy sources of low-value biomass.
<a href="#">WO 2023097403</a> <a href="#">A1 20230608</a>	logen Corp (CA)	<b>Hybrid-electric process and/or system for producing hydrogen.</b> A process and/or system for producing hydrogen or fuel, fuel intermediate, and/or chemical product produced using the hydrogen. The hydrogen is produced from a feedstock containing biomethane, where the biomethane is produced from biomass. The hydrogen production includes methane reforming a feed comprising biomethane, where at least part of the reforming is conducted in one or more electrically heated reactors (e.g., direct or indirect). Carbon-containing material derived from part of the biomass not converted to hydrogen is stored as part of one or more CCS processes.
<a href="#">WO 2023097404</a> <a href="#">A1 20230608</a>	logen Corp (CA)	<b>Biomethane and/or hydrogen produced from biomass having reduced lifecycle greenhouse gas emissions.</b> A process and/or system for producing biomethane, hydrogen, or fuel, fuel intermediate, and/or chemical product from the biomethane or hydrogen. The biomethane and/or hydrogen is produced in a process that converts biomass to biomethane. In certain embodiments, the biomethane production process includes anaerobic digestion, which produces biogas and digestate. Carbon-containing material (e.g., derived from the biomass) is stored and/or used as part of at least one carbon capture and storage process, where the carbon-containing material includes (i) carbon dioxide produced from the biomethane production process (e.g., produced from anaerobic digestion), and (ii) carbon-containing material obtained or derived from residue of the biomethane production process, and optionally includes (iii) carbon dioxide produced from the hydrogen production process.
<a href="#">CN 115851316 A</a> <a href="#">20230328</a>	Jiangsu Electric Power Res Inst Co Ltd et al. (CN)	<b>Electricity-heat-hydrogen triple co-generation device and method based on biomass gasification.</b> The invention discloses an electricity-heat-hydrogen triple co-generation device and method based on biomass gasification. The device comprises a biomass gasification unit, a chemical looping hydrogen production unit, a gas turbine power generation unit, a steam turbine power generation-heat supply unit and pipelines. Compared with a traditional solid fuel gasification hydrogen production device, the process is simple, only three stages of gasification, combustion and water decomposition hydrogen production are needed, and the hydrogen purity reaches 99% or above; self-heating of the hydrogen production unit is realized by adjusting the amount of air entering the air reactor, and the reaction temperature of the hydrogen production unit is regulated and controlled; the proportion of the hydrogen amount and the power generation amount is adjusted and controlled by adjusting the proportion of synthesis gas entering the chemical looping hydrogen production unit and the gas turbine unit, the heat supply requirement is met by adjusting the steam extraction amount or the steam extraction point position of a steam turbine, and the proportion of the power generation amount and the heat supply amount is adjusted and controlled; therefore, the proportion of power generation, heat supply and hydrogen production of the device is flexibly regulated and controlled.
<a href="#">KR 20230067890</a> <a href="#">A 20230517</a>	Republic Korea Man Rural Dev Admin et al. (KR)	<b>Hydrogen production process using agricultural biomass.</b> The present invention relates to a hydrogen production device, a biomass storage unit for storing biomass; a hydrogen production unit using acid fermentation to produce hydrogen by acid-fermenting the biomass and electrolyzing the generated organic acid; And a hydrogen production unit using steam reforming for anaerobic digestion of the biomass and steam reforming of the generated gas to produce hydrogen, wherein the biomass storage unit is based on the characteristics of the biomass, the hydrogen production unit using acid fermentation or the It includes a control unit for controlling to provide the stored biomass to the hydrogen production unit using steam reforming.
<a href="#">KR 20230036646</a> <a href="#">A 20230315</a>	Univ Ajou Ind Academic Coop Found (KR)	<b>Method for producing hydrogen through co-pyrolysis of biomass.</b> The method includes a method of co-pyrolysis of lignocellulosic biomass and food waste. Alternatively, the method includes a method of co-pyrolysis of waste polymer materials including lignocellulosic biomass and polypropylene or polyethylene.



Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">KR 20230068691 A 20230518</a>	Univ Ewha Ind Collaboration (KR)	<b>Thermochemical redox cycle combined with biomass gasification process for hydrogen production.</b> The present application relates to a hydrogen double generation process for generating hydrogen through an upper cycle process and a lower cycle process, and a hydrogen double generation device driving the same.
<a href="#">CN 115869877 A 20230331</a>	Univ Xi An Jiaotong (CN)	<b>Thermal hydrogen co-production system and method for coupling solar energy with biomass energy.</b> The invention discloses a solar energy and biomass energy coupled thermal-hydrogen co-production system and method. The system comprises a microwave reactor, a biomass gasifier, a combustion reactor, an air preheater, a catalytic reforming reactor, a photo-thermal medium energy storage system, a CO2 separation device and an activated carbon preparation device. Microwave baking pretreatment, biomass gasification hydrogen production and chemical looping combustion are combined, so that the problem of high tar content in the synthesis gas is solved, the quality of the synthesis gas is improved, and efficient separation of CO2 is realized; high-temperature molten salt in the photo-thermal medium energy storage system is used for providing heat energy for the catalytic reforming reaction of the synthesis gas, so that the energy consumption of the catalytic reforming reaction is reduced; the system not only can realize hydrogen production, but also can realize near-zero emission of CO2; the biomass energy and the solar energy input into the system belong to renewable energy sources, and the cost of large-scale collection and storage of biomass raw materials is avoided while efficient and clean utilization of the biomass resources and the solar energy is achieved.

### Otros biocombustibles (hidrobiodiesel, etc.)

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2023046296 A1 20230330</a>	Chevron Singapore Pte Ltd (SG) et al.	<b>Low sulfur marine fuel compositions.</b> A marine bunker fuel composition is disclosed. The composition is compliant with fuel standard ISO 8217 - 2017 Table 2 and contains at least 70 vol % of a marine fuel oil blendstock and from 1 vol % to 30 vol % of a fatty acid alkyl ester.
<a href="#">WO 2023111702 A1 20230622</a>	Chevron USA Inc (US)	<b>Ionic liquid alkylation of isobutane with bio-ethylene to produce alkylate.</b> A process for producing high octane bio-based alkylate is provided. The process involves reacting isobutane and bio-ethylene using an ionic liquid catalyst. Reaction conditions can be chosen to assist in attaining, or to optimize, desirable alkylate yields and/or properties.
<a href="#">US 2023159835 A1 20230525</a>	Exxonmobil Technology & Engineering Company (US)	<b>Integrated process for the manufacture of renewable diesel.</b> Methods and systems are provided for producing renewable diesel. Disclosed herein is an example method of method for integration of product separation in renewable diesel production, including: stripping a hydrotreated effluent stream comprising hydrotreated biofeedstock to remove isomerization contaminants and form at least an isomerization feed stream and a first gas stream; contacting an isomerization effluent with the first gas stream such that the isomerization effluent adsorbs at least C4+ hydrocarbons from the first gas stream; and stripping at least a portion of an isomerization effluent in an integrated stripper while separated from the stripping the hydrocarbon stream by a dividing wall to remove hydrocarbons having 10 carbons or less and form at least a product stream and a second gas stream, wherein the product stream comprises renewable diesel.
<a href="#">US 2023098592 A1 20230330</a>	Exxonmobil Technology & Engineering Company (US)	<b>Method of refinery processing of renewable naphtha.</b> This application relates to renewable diesel production and to production of renewable naphtha in a renewable diesel unit. Disclosed herein is an example of a method of renewable diesel production. Examples embodiments of the method may include hydrotreating the biofeedstock by reaction with hydrogen to form a hydrotreated biofeedstock; contacting at least a portion of the hydrotreated biofeedstock with a dewaxing catalyst to produce a renewable diesel product and a renewable naphtha product; separating the renewable diesel product and the renewable naphtha product in a product splitter; and monitoring an octane number of the renewable naphtha product with an analyzer.
<a href="#">WO 2023088771 A1 20230525</a>	IFP Energies Now (FR)	<b>Renewable diesel production from catalytic pyrolysis feedstock.</b> The present invention provides a catalytic pyrolysis process for the production of renewable diesel fuel. The present invention provides a process for preparing renewable diesel fuel, comprising preparing renewable diesel fuel by a) fractionating a mixture comprising renewable aromatics to produce a first fraction boiling at 180 °C to 350°C at atmospheric conditions, and a fraction boiling below the boiling point of the first fraction, blending at least a portion of the first fraction with at least one distillate cut having lower aromatic content than the first fraction, and b) hydrogenating a blend of the first fraction and distillate cut having lower aromatic content to produce a hydrogenated fraction comprising a renewable diesel fuel.



Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">EP 4183856 A1</a> <a href="#">20230524</a>	TotalEnergies OneTech (FR)	<b>Base for marine fuel comprising a component from a renewable source and method of manufacturing.</b> The invention relates to a marine fuel base comprising an alkyl ester component of renewable origin, derived from fatty acids of plant or animal origin. The addition of this component of renewable origin improves the viscosity and stability of a petroleum residuum, especially a visbroken residuum.
<a href="#">US 2023125018 A1</a> <a href="#">20230420</a>	Shell USA Inc (US)	<b>Biofuel blends with improved oxidation stability and lubricity.</b> A biofuel includes a mixture having a gasoil generated from hydrolysis and hydroconversion of a solid biomass containing lignocellulose and an isomerized hydroprocessed ester and fatty acid (HEFA) generated from hydrotreating a renewable resource having fats and oils. The gasoil has a cetane index less than 46 and at least 10 parts per million weight (ppmw) of a heteroatom and a cetane index of the biofuel is greater than 46.
<a href="#">US 2023096521 A1</a> <a href="#">20230330</a>	Uchicago Argonne LLC (US)	<b>Process for conversion of waste to fuel.</b> A method for conversion of food waste to biofuel can include a first fermentation in which food waste is converted C2-C4 short-chain carboxylic acids, and a second fermentation in which the C2-C4 short-chain carboxylic acid are elongated into C5-C8 medium-chain carboxylic acids. Medium-chain carboxylic acids can undergo hydrogenation-dehydration of the medium-chain carboxylic acids into C5-C8 linear olefins. The C5-C8 linear olefins are then oligomerized to a C10-C25 mixture comprising olefins, paraffin, cycloparaffins, and aromatics through dimerization; and saturated to C10-C25 mixture by hydrogenation to produce the biofuel.
<a href="#">CN 115960637 A</a> <a href="#">20230414</a>	- (CN)	<b>A kind of marine fuel oil and its preparation method.</b> The present disclosure relates to a marine fuel oil and a preparation method thereof. The marine fuel oil includes: biomass-based component oil and heavy marine fuel oil, wherein the biomass-based component oil includes C8-C15 paraffins and /or oxygen-containing compounds, the distillation range of which is 140-350°C, and based on the total weight of the biomass-based component oil, the content of components within the range of 180-340°C distillation range is 50-98wt%. The marine fuel oil contains biomass-based component oil, and because the biomass-based component oil has more excellent lower sulfur content and viscosity, the marine fuel oil of the present disclosure has lower sulfur content and low viscosity, and All key indicators meet RMG180 or RMG380 product standards.
<a href="#">CN 116024021 A</a> <a href="#">20230428</a>	- (CN)	<b>A method of preparing biomass-based fuel components and biomass-based fuel components.</b> The present disclosure relates to a method for preparing a biomass-based fuel component and a biomass-based fuel component, the method comprising: S01. Making the pre-mixed material containing the preheated biomass-based linear alkanes and hydrogen-containing gas enter the hydroisomerization reactor, contact with the hydroisomerization catalyst, and perform the hydroisomerization reaction to obtain the hydroisomerization product; S02. Carry out gas-liquid separation to the hydroisomerization product, obtain gas phase product and liquid phase product; S03. The gas phase product is subjected to boosting treatment and then returned to operation S01 for use as a hydrogen-containing gas; the liquid phase product is subjected to fractional distillation to obtain a biomass-based fuel component. The method can effectively reduce the freezing point of biomass-based linear alkanes by performing hydroisomerization treatment on biomass-based linear alkanes. Therefore, the disclosed method can prepare biomass-based fuels with low freezing point and high and low temperature fluidity components.

# PATENTES BIOPRODUCTOS

Biomateriales (de construcción, medicina, embalaje, etc.)		
Biocomposites y biofibras		
Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2023065030 A1 20230427</a>	CTK Res and Development Canada Ltd (CA)	<b>Biodegradable polymer based biocomposites.</b> The present invention provides compositions for making biodegradable biocomposites, comprising poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV) or a mixture of PHBV and polybutylene adipate terephthalate (PBAT); a hemp residue; and optionally PBAT grafted with one or more compatibilizers selected from maleic anhydride, glycidyl methacrylate, pyromellitic anhydride, acrylic acid, polyacrylic acid, methylene diphenyl diisocyanate, poly(glycidyl methacrylate, copolymer(s) of glycidyl methacrylate and copolymers of acrylic acid, and/or one or more compatibilizers from maleic anhydride, glycidyl methacrylate, pyromellitic anhydride, acrylic acid, polyacrylic acid, methylene diphenyl diisocyanate, poly(glycidyl methacrylate, copolymer(s) of glycidyl methacrylate and copolymers of acrylic acid.
<a href="#">EP 4190863 A1 20230607</a>	Formosa Plastics Corp (TW) et al.	<b>Thermoplastic composition, thermoplastic composite, and method for producing thermoplastic composite.</b> The present invention relates to a thermoplastic composition, a thermoplastic composite, and a method for producing the thermoplastic composite. In the method for producing the thermoplastic composite, a polymer, an acid-modified lignin with a specific element content and a compatibilizer with a specific melt flow index and a specific maleic anhydride content are used to produce the thermoplastic composite. Hydroxy groups of the acid-modified lignin react with maleic anhydride groups of the compatibilizer to generate ester bonds via an in-situ reaction catalyzed by acidic groups of the acid-modified lignin to enhance compatibility between the polymer and the lignin, thereby increasing a mechanical strength of the resulted thermoplastic composite.
<a href="#">WO 2023052684 A1 20230406</a>	Metsae fibre OY (FI)	<b>A method, a product obtained by the method, and dried cellulosic and/or lignocellulosic particles.</b> According to an example aspect of the present invention, there is provided a method comprising: providing a wet pulp composition comprising cellulosic and/or lignocellulosic fibres; mixing the wet pulp composition with at least one additive chemical to obtain a mixture of wet pulp and additive chemicals; at a consistency of the mixture of less than 80%, preparing cellulosic and/or lignocellulosic particles from the mixture; drying the particles, wherein fibres in the particles are dispersible to a molten thermoplastic or thermoset matrix to obtain a dispersion of fibres in the molten matrix.
<a href="#">EP 4183708 A1 20230524</a>	Planetpack Packaging Ind Lda (PT)	<b>Biodegradable compositions and methods for producing same.</b> Biodegradable compositions comprising cellulose fiber and starch, in a ratio of fiber:starch between 5:1 and 1:2 by weight, wherein the cellulose fiber is virgin fiber, lignocellulosic biomass, organic residues, primary sludge, or any combination thereof, are disclosed. Articles comprising the compositions and methods for producing thereof are also disclosed.
<a href="#">EP 4177297 A1 20230510</a>	Sali Matuszok Sevda et al. (DE)	<b>An ecological biodegradable packaging material from aloe vera reinforced bioplastics and methods of using the same.</b> The invention relates to a Method for producing an aloe vera reinforced bio-composite material, comprising: a) Plasticizing a binder in a first extruder, wherein the binder comprises a polymer; b) Providing a mixture of fibrous filler material made from aloe vera, in particular from aloe vera leaves, and a hydrophobic agent dissolved and/or dispersed in a liquid carrier; c) Mechanically shearing and drying the mixture in a second extruder whereby liquid is at least partly or completely extracted from the mixture; and .d) Blending the dried mixture with the plasticized binder. The invention further relates to an aloe vera reinforced bio-composite material and a container made thereof.
<a href="#">EP 4166345 A1 20230419</a>	Sram Llc (US)	<b>Natural fiber composite bicycle component.</b> A rim for a bicycle wheel includes a radially inner portion disposed along an inner circumference of the rim. The rim also includes a first sidewall, a second sidewall spaced apart from the first sidewall, and a radially outer tire engaging portion disposed along an outer circumference of the rim. The first sidewall, the second sidewall, the radially outer tire engaging portion, the radially inner portion, or any combination thereof includes a composite laminate. The composite laminate includes a layer of a composite material. The composite material includes a matrix of a polymer-based material and natural fibers of a reinforcing material. A volume of a respective one of the natural fibers of the layer of the composite material is greater before lamination of the composite laminate compared to the volume of the respective one natural fiber after the lamination of the composite laminate.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2023111712 A1</a> <a href="#">20230622</a>	Stora Enso OYJ (FI)	<b>Composite product.</b> A composite product comprises a solid wood component and a coating layer on at least one side of the solid wood component. The at least one side of the solid wood component has a wood grain. The coating layer comprises at least one thermoplastic polymer and non-spherical pigment particles distributed within the coating layer. The coating layer has a surface pattern at least partly mimicking the wood grain.
<a href="#">EP 4194484 A1</a> <a href="#">20230614</a>	Traceless Mat GmbH (DE)	<b>A process for producing a thermoplastic material, a process of forming a granulate or extrudate, thermoplastic product and use of the thermoplastic material.</b> A process for producing a thermoplastic material for use as powder or slurry for further processing such as injection moulding or coating, comprising the steps: (i) mixing a biomass containing prolamins, such as a grain source or a water insoluble fraction of a grain, having prolamins and lipids, and an organic solvent to obtain undissolved components and dissolved components comprising dissolved prolamin, lipids and other dissolved components, (ii) extracting said dissolved components into a first liquid and extracting undissolved components in a first solid under the following conditions: a. maintaining temperature below 80°Celsius, preferably below 75°C, most preferably below 70°Cb. maintaining dielectric constant between $\epsilon_r$ 30 and 42 at 25°Cc. maintain pressure level p at below 2 bard. performing extraction for no longer than an extraction time $t_e$ (in min) = $k_{e1} * T$ (in °C) + $k_{e2} * \epsilon_r$ (at 25°C) + $k_{e3} * p$ (bar absolute), where $k_{e1}$ is in the range between 0.04 and 1.00 $k_{e2}$ is in the range between 0.08 and 2.00 $k_{e3}$ is in the range between 1.70 and 60.00 (iii) separating the first solid from the first liquid (iv) recovering said thermoplastic material from the first liquid as powder by removing organic solvent under the following conditions: - maintaining temperature of the prolamins below 80°C, preferably below 75°C, most preferably below 70°C - maintaining a dielectric constant $\epsilon_r$ between 30 and 42 at 25°C - maintaining a pressure level at below 2 bar - performing recovering for no longer than for no longer than a recovering time $t$ (in min) = $k_{r1} * T$ (in °C) + $k_{r2} * \epsilon_r$ (at 25°C) + $k_{r3} * p$ (bar absolute) where $k_{r1}$ is in the range between 0.0004 and 12.0000 $k_{r2}$ is in the range between 0.0008 and 7.0000 $k_{r3}$ is in the range between 0.0167 and 80000.0000.
<a href="#">EP 4159796 A1</a> <a href="#">20230405</a>	Univ Almeria (ES)	<b>Anthraquinone and silanized functionalized materials derived from olive stone.</b> The present invention relates to a new anthraquinone and silanized functionalized material useful in potential luminescence and/or catalytic applications and as fillers in the composite manufacturing world.
<a href="#">WO 2023108185 A1</a> <a href="#">20230622</a>	Univ Wien Bodenkultur et al. (AT)	<b>Method for producing a composite material.</b> The present invention relates to a method for producing a composite material, wherein the composite material is an agglomerate which comprises chips of lignocellulosic biomass, in particular wood, the chips being connected to a water-weakenable, reversibly bindable binder, and the method comprising the following steps: (a) providing loose chip material, comprising or consisting of chips that are wetted at their surface at least partially, preferably fully, with the binder, (b) optionally adjusting the water content of the chip material, and (c) pressing the chip material to obtain the composite material, the chip material having a water content prior to the pressing of between 5 wt.% and 40 wt.% in relation to its total weight, the temperature of the pressed chip material in a first pressing phase being at least 100°C. The invention further relates to a composite material.

## Bioplásticos

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">EP 4166674 A1</a> <a href="#">20230419</a>	ACBC Srl (IT)	<b>Method for the preparation of polyhydroxybutyrate.</b> The present invention relates to methods for the preparation of high molecular weight polyhydroxybutyrate (PHB) by culturing <i>Bacillus megaterium</i> strains in a mixture of agri-food wastes, to PHB obtained or obtainable by said methods as well as to its use in the preparation of articles such as, for example, soles and / or heels for shoes.
<a href="#">EP 4177290 A1</a> <a href="#">20230510</a>	Artificial Nature SL (ES)	<b>A triblock copolymer, a process for obtaining thereof and uses thereof.</b> The present invention relates to a triblock copolymer comprising the structure: Poly(lactic acid (PLA) -X- poly(lactic acid (PLA), wherein X is an unsaturated polymacrolactone (PML) or a copolymer containing the PML and a polyester. The present invention further relates to a process for obtaining said triblock copolymer and to uses thereof.
<a href="#">WO 2023104316 A1</a> <a href="#">20230615</a>	HES-SO Valais-Wallis et al. (CH)	<b>Extraction of polyhydroxyalkanoates from biomass, and uses thereof.</b> The present invention pertains to the technical field of extracting PHA from biomass, in particular by means of solvents, and treating the extracted PHA to give a desired intermediate. The present invention further relates to using such intermediate as an additive for fuel. For any of these purposes, the applied solvent is an important factor to improve both process efficiency and sustainability, especially on an industrial scale.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2023085374</a> <a href="#">A1 20230519</a>	Kaneka Corp (JP)	<b>Method for producing polyhydroxyalkanoate.</b> This method for producing a polyhydroxyalkanoate comprises: a step for culturing polyhydroxyalkanoate-producing microorganisms to obtain microbial cells in which polyhydroxyalkanoates are accumulated; and a step for treating the microbial cells with an enzyme. The microbial cells have a number-average aspect ratio of a cell size of at least 2.0, and the enzyme includes a cell wall-degrading enzyme. The enzyme may further include a proteolytic enzyme.
<a href="#">WO 2023055373</a> <a href="#">A1 20230406</a>	Kimberly Clark Co (US)	<b>Depolymerization of a polyhydroxyalkanoate and recycling of hydroxyalkanoate monomer obtained thereby via a metabolic process.</b> A process is disclosed for production of a polyhydroxyalkanoate that includes depolymerization of a post-consumer polyhydroxyalkanoate and utilization of the hydroxyalkanoate monomer thus produced as a carbon source for a microorganism capable of production of a polyhydroxyalkanoate. Methods can be utilized for true cyclic use of polyhydroxyalkanoates including polyhydroxybutyrates. Various aspects are described including simultaneous depolymerization and polymer production, utilization of purified depolymerase enzymes and/or microorganisms that express a depolymerase in conjunction with a microorganism that produces polymer, utilization of microorganisms that produce both a depolymerase and a new polymer, and utilization of genetically modified organisms to produce natural or modified depolymerase enzymes.
<a href="#">WO 2023055109</a> <a href="#">A1 20230406</a>	Korea Institute of Energy Tech (KR)	<b>Method for producing polyhydroxyalkanoate, polyhydroxyalkanoate produced using same, and dry fermenter for producing polyhydroxyalkanoate.</b> Disclosed are a method for producing a polyhydroxyalkanoate, a polyhydroxyalkanoate produced using same, and a dry fermenter for producing a polyhydroxyalkanoate. The present invention is characterized by comprising: a step for producing a concentrated biomass fermentation broth containing a carboxylate produced by the dry fermentation of biomass; and a step for producing a polyhydroxyalkanoate by culturing a polyhydroxyalkanoate (PHA)-producing microorganism in the concentrated biomass fermentation broth, wherein, in the step for producing the polyhydroxyalkanoate, the reducing power for producing the polyhydroxyalkanoate is controlled according to the concentration of the carboxylate.
<a href="#">WO 2023046580</a> <a href="#">A1 20230330</a>	Nestle SA (CH)	<b>PHA-based container and method for manufacturing such container.</b> The present invention relates to a plastic container for a liquid, comprising a body portion and a neck portion. The body portion comprises a body portion wall forming a reservoir adapted to contain the liquid. The neck portion is formed by a neck portion wall that forms an opening for filling the container with liquid and emptying the container. The container body portion wall and the container neck portion wall are made of biodegradable plastics at least the body portion wall being made of a material comprising 40 to 99.9 weight percent of polyhydroxyalkanoate (PHA). The maximum thickness of the neck portion wall is less than 2mm, and preferably comprised between 1.2 mm and 1.6mm. This enhances the biodegradability of the whole container.
<a href="#">EP 4166612 A1</a> <a href="#">20230419</a>	Polymaris Biotechnology (FR)	<b>Polyhydroxyalkanoate compositions for making 3D printing filaments, formulations including same, method of making same and consumable filament for 3D printing.</b> The invention relates to formulations and compositions of consumable filaments for 3D printing comprising at least polyhydroxyalkanoate. The invention also relates to a process for the preparation of such formulations and compositions. The invention also relates to consumable filaments for 3D printing comprising such formulations.
<a href="#">WO 2023086004</a> <a href="#">A1 20230519</a>	Polynex Tech AB (SE)	<b>PHA production using hydrothermally treated organic material.</b> The present invention describes a method comprising providing a hydrothermally treated organic material and producing polyhydroxyalkanoates (PHAs) from the hydrothermally treated organic material.
<a href="#">WO 2023111092</a> <a href="#">A1 20230622</a>	Productos Solubles SA (ES)	<b>Capsule for preparing an infusion beverage.</b> The invention relates to a capsule for preparing an infusion beverage from the interaction between an infusion product and a liquid, said capsule comprising a capsule body and a lid. The capsule body and the lid are mutually connected to one another for creating a closed infusion chamber containing the infusion product. The capsule body is made of a capsule body material comprising between 60% to 89.5% w/w of PBS, PBAT, PLA, TPS, PHA, regenerated cellulose or combinations thereof and between 0.5 and 5% w/w, preferably between 0.5 and 2% w/w of at least one catalysator for enhancing the biodegradability of the capsule body, said at least one catalysator comprising one among the group of polyphosphate salts, phthalates, epoxides or combinations thereof and finally one or several organic and inorganic fillers respectively between 5 and 25% w/w and 5 and 20% w/w.

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

### Biofertilizantes, bioadhesivos, etc.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2023084157</a> <a href="#">A1 20230519</a>	Aalto Univ Foundation SR (FI)	<b>Water-based epoxidized lignin and process for its production and its use as phenol-formaldehyde replacement in adhesives and cross-linkers.</b> The invention is the synthesis and use of epoxidized lignin (EL) preferably with but also without colloidal lignin nanoparticles (CLP, plural CLPs). The invention is divided in two parts, synthesis and utilization. The synthesis of the invention is performed in the following general steps: Preparation of an aqueous solution of lignin and a base. Combining the lignin solution with epichlorohydrin at 1 - 90 °C, where the amount of epichlorohydrin should be within 1 - 20 ml per gram of lignin. Allowing the epoxidation reaction to take place between 1 minutes to 5 hours, while stirring the mixture. Removal of excess epichlorohydrin from epoxidized lignin solution by e.g. solvent extraction. Separation of EL from the aqueous solution. EL functions as a cross-linker and may be used e.g. to prepare adhesives, surface coatings, and composite materials. EL may also be used as foaming agent in water-based solutions.
<a href="#">EP 4180463 A1</a> <a href="#">20230517</a>	Agrana Beteiligungs AG (AT)	<b>Hydroxypropylated granular starch with low propylene glycol content.</b> The present invention provides a hydroxypropylated granular starch with a degree of molar substitution of hydroxypropyl groups (MS) of above 0.25 and a reduced content of volatile organic compounds (VOC), namely a propylene glycol content of below 2 wt.-% of the starch, and a process for the preparation of said hydroxypropylated granular starch. The present invention further relates to a hydroxypropylated starch with a degree of molar substitution of hydroxypropyl groups (MS) of above 0.25 and a propylene glycol content of below 2 wt.-% of the starch, and to a construction material composition or cementitious and/or dispersion-modified construction adhesive comprising said hydroxypropylated starch.
<a href="#">WO 2023109674</a> <a href="#">A1 20230622</a>	Beijing Acad Agric & Forestry (CN)	<b>Bio-based polyol for polyurethane, coating liquid and coated controlled release fertilizer thereof.</b> Disclosed in the present invention are a bio-based polyol, a coating liquid, a coated controlled release fertilizer and a preparation method. The bio-based polyol is prepared according to the following method: adding biomass, a liquefying agent, a co-liquefying agent and an acidic catalyst according to a mass ratio of 100:100-500:1-10:2-15 into a reaction kettle for undergoing a reaction, cooling to 100°C or below by using an ice water bath after the reaction is finished, and collecting a supernatant. The coating liquid comprises the following raw materials: the bio-based polyol, an alkaline catalyst, other polyols and an auxiliary agent. The coated controlled release fertilizer is composed of a core and a membrane shell, wherein the core is a fertilizer particle, the membrane shell is formed by the coating liquid and a curing agent undergoing a solvent-free in-situ reaction, and the mass of the membrane shell is 2-8% of the mass of the coated controlled release fertilizer.
<a href="#">ES 2941288 A1</a> <a href="#">20230519</a>	Biobab R&D SL (ES)	<b>Peribacillus aracenensis BB004 stimulant of adaptive metabolism of plants against water stress, improves plant nutrition and polyphenol content.</b> Peribacillus aracenensis bacterial strain (CECT 30655), microorganism of the group of Gram + bacteria, genus Peribacillus, stimulant of the adaptive metabolism of plants against water stress, improver of plant production and nutrition, and improver of polyphenol content. This strain, isolated from the rhizosphere of Pinus pinaster, on nutrient agar (PCA), has been characterized from the morphological, biochemical and genetic point of view by total genome sequencing, identifying it as a new species. It can be used to increase production under water stress conditions, due to its ability to increase CO <sub>2</sub> fixation and transpiration, optimizing energy capture through photosynthesis and reducing oxidative stress; as a biofertilizer, due to its ability to improve the absorption of nutrients both in the presence and in the absence of water stress; and to improve the quality of the fruits, due to its ability to increase antioxidant polyphenols in plant species of pharmacological and nutritional interest.
<a href="#">WO 2023075770</a> <a href="#">A1 20230504</a>	Chroma Paper Llc (US)	<b>Biodegradable reinforced paper packaging material.</b> A paper packaging material having a paper layer with a polyethylene coating on one surface, a biodegradable resin grid on the opposite surface to enhance its strength while maintaining reduced weight and a thermo-sealing resin, which eliminates the use of glues in the packaging process. The vegetal resin is made out of vegetable wax, acrylic styrene copolymer, demineralized water, water based silicone and natural fungicide.
<a href="#">EP 4183815 A1</a> <a href="#">20230524</a>	Evertree (FR)	<b>Adhesive composition comprising ground pea seeds and an amine-based azetidinium-functional cross-linker.</b> The invention relates to an adhesive composition comprising:- ground pea seeds,- an amine-based azetidinium-functional cross-linker, and- water. The invention also relates to an article and its preparation process, use of the adhesive composition according to the invention, and use of ground pea seeds.

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2023114321 A1 20230622</a>	Purdue Research Foundation (US)	<b>Underwater bonding with a biobased adhesive.</b> Underwater adhesive compositions comprising a zein and a tannic acid, alone or further in combination with FeCl <sub>3</sub> , an inorganic filler, a natural polymer, or any combination thereof; and a method of making them.
<a href="#">EP 4174108 A1 20230503</a>	Ricoh Co Ltd (JP)	<b>Resin particle, toner, developer, developer storage container, resin particle producing method, toner producing method, image forming apparatus, and image forming method.</b> The present disclosure provides a resin particle including a binder resin, in which the binder resin contains a biomass-derived resin and a recycled resin, and a content (% by mass) of the biomass-derived resin and a content (% by mass) of the recycled resin in the binder resin satisfy relational equation (1): Content of recycled resin > Content of biomass-derived resin.
<a href="#">WO 2023048659 A1 20230330</a>	Univ Yeditepe (TR)	<b>Halotolerant bacterial strains as bio-fertilizer with growth-promoting and abiotic stress alleviation benefits for plants and application thereof.</b> The present invention relates to a bio-fertilizer and/or a bio-stimulant comprising at least one microbe selected from the group consisting of Pseudomonas monteilii (XE15) having NRRL Accession No. B-67997, Bacillus subtilis (XE18) having NRRL Accession No. B-67996, and Pseudomonas sp. (TR8) having NRRL Accession No. B-67998, and combinations thereof.
<a href="#">WO 2023070800 A1 20230504</a>	Zhou Xia (CN)	<b>Process for producing bio-based cyclic anhydride monoester wood adhesive by using bio-based powder raw material.</b> A process for producing a powder cyclic anhydride monoester wood adhesive by using a bio-based raw material. The process comprises: appropriately degrading a powder raw material with a suitable water content in the presence of a multifunctional catalyst, and also, subjecting same to an esterification reaction with a cyclic anhydride to introduce a curable functional group, so as to generate a functionalized powder raw material; and mixing the separated functionalized flour material with water, and adding a curing agent to form a heat-curable wood adhesive. A double-layer plywood sample is prepared according to ASTM International Standard 2017, D2339-98, and is cured in a hot press at a pressure of 3 MPa and a temperature of 150-200°C for 3-10 min. The dry strength and wet strength of the double-layer plywood sample are as high as 3.5 MPa, and the wood failure ratio exceeds 80%.

## Biocosméticos, Biofarmacéuticos

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">WO 2023086710 A1 20230519</a>	Cargill Inc (US)	<b>Carrageenan and starch texturizer based natural deodorant.</b> The present technology provides a natural-based deodorant composition that includes about 5.0 weight percent (wt%) to about 15.0 wt% of a texturizer based on total weight of the deodorant composition, about 0.5 wt% to about 2.5 wt% of a gelling agent comprising kappa carrageenan; and about 5.0 wt% to about 35.0 wt% of an emollient composition; and water; wherein the texturizer includes a n-octenyl succinate anhydride (nOSA) modified starch and a hydroxypropylated starch, wherein a weight ratio of the nOSA modified starch to hydroxypropylated starch is about 3:1 to about 20:1.
<a href="#">ES 2942220 A1 20230530</a>	Cellbitech SL (ES)	<b>Argan pulp powder, its food and functional use.</b> Argan pulp powder, its food and functional use. The present invention is based on the functional use of a part of the fruits of Argania spinosa as a component of food, nutraceutical and pharmaceutical formulations, as well as the procedure for obtaining a suitable material to be used from these fruits. The report describes the procedure for obtaining a pharmaceutical powder obtained from the aforementioned fruits using a device consisting of a rotating drum, a current of air that can be heated, and the product fresh that is introduced in a bag with a special mesh. With the procedure we manage to dry, pulverize and condition the product for its later use as a pharmaceutical and food ingredient.
<a href="#">EP 4173489 A1 20230503</a>	Fundacio Inst Dinvestigacio Sanitaria Pere Virgili et al. (ES)	<b>Biocompatible extracellular vesicles obtained from fermented food industry by-products, compositions and applications thereof.</b> The present invention refers to biocompatible extracellular vesicles, isolated from fermented food industry by-products, wherein the lipidome of the vesicles comprises at least eight families of lipids including fatty acyls (FA), glycerophospholipids (GP), glycerolipids (GL), sphingolipids (SP), saccharolipids (SL), polyketides (PK), sterol lipids (ST) and prenol lipids (PR), with the following ratios between these lipids families: from 0.4 to 1.4 for FA/GL, from 0.2 to 0.4 for FA/GP, from 1.3 to 3.4 for FA/PK, from 4.2 to 7.1 for FA/PR, from 61.2 to 124 for FA/SL, from 0.9 to 3.0 for FA/SP and from 0.9 to 1.6 for FA/ST. The present invention also refers to a method for the isolation of said vesicles, compositions comprising the vesicles and applications thereof.



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<a href="#">EP 4198093 A1</a> <a href="#">20230621</a>	Givaudan SA (CH)	<b>A method of extracting natural dyestuffs from the waste-streams of a botanical biomass.</b> A method of extracting natural dyestuffs from the waste-streams of a botanical biomass. The method is a one-pot process of preparing a dyestuff comprising the steps of:- providing a botanical biomass selected from rose containing an oil useful as a flavour, fragrance, cosmetic, medicinal or well-being ingredient;- treating the biomass with an organic solvent in which the oil is soluble to form an oil-containing phase;- separating the oil-containing phase from the biomass;- subjecting the biomass to a process of steam distillation to remove any residual solvent from the biomass and to create an aqueous phase containing the dyestuff; and- recovering the dyestuff in an aqueous solution.
<a href="#">WO 2023053714</a> <a href="#">A1 20230406</a>	Honda Motor Co Ltd (JP)	<b>Composition and extract of green alga chlamydomonas reinhardtii.</b> Provided is a composition that contains green alga Chlamydomonas reinhardtii or an extract of the green alga C. reinhardtii, wherein the green alga C. reinhardtii or the extract of the green alga C. reinhardtii acts as an agonist of a retinoic acid receptor.
<a href="#">WO 2023059925</a> <a href="#">A1 20230413</a>	Inolex Investment Corp (US)	<b>Biobased polyglyceryl esters and compositions comprising the same.</b> The present invention relates to biobased polyglyceryl ester compounds and compositions and formulations comprising same, processes for preparing the inventive biobased polyglyceryl ester compositions, as well as applications thereof including the use of the inventive compounds and compositions in formulations of products or components of products. The biobased polyglyceryl ester composition may comprise a mixture including one or more compounds of Formula (I): wherein: PG is a polyglyceryl group comprising greater than 40% hexaglycerol and higher polyglycerols and less than 60% pentaglycerol and lower polyglycerols, R is a linear or branched C5-C8 alkyl group, n = from 1 to 3, and wherein substantially all of the carbon present in the one or more compounds of Formula (I) is biobased.
<a href="#">EP 4169502 A1</a> <a href="#">20230426</a>	Provital SAU (ES)	<b>Cosmetic and dermatological use of rubus fruticosus fruit extract.</b> The present invention relates to a cosmetic and dermatological use of a Rubus fruticosus fruit extract (RFE) for increasing adipocytic mass in adipose tissue. It relates also to a cosmetic method therefor comprising the step of topically applying to skin the RFE or a cosmetic composition comprising the RFE.
<a href="#">EP 4173633 A1</a> <a href="#">20230503</a>	Raiz Instituto de Investig da Floresta e Papel (PT)	<b>Products comprising essential oil or extract with phenolic compounds obtained from the residual water of the hydrodistillation of eucalyptus globulus leaves and their uses.</b> The present invention relates to products comprising essential oil (EO) or extract with phenolic compounds obtained from the residual water of the hydrodistillation (HRW) of Eucalyptus globulus (E. globulus) leaves that demonstrate antifungal activity in various strains of fungi, or activities anti-inflammatory and/or antisenescent for topical or non-topical application in the absence of cytotoxicity. Another aspect of the present invention relates to formulations that incorporate the products, bacterial cellulose (BC) membranes that incorporate the products that include the HRW, and face masks from the BC membranes.
<a href="#">WO 2023062562</a> <a href="#">A1 20230420</a>	Univ Catolica Portuguesa et al. (PT)	<b>Lignin, methods of extraction and uses thereof.</b> The present disclosure relates to a light-brown lignin, with a sweet and woody odour, antioxidant activity and ultraviolet protection for use in cosmetics. The present disclosure also relates to an alkaline method of extracting said lignin from sugarcane bagasse using mild conditions, the lignin obtained by the method of the present disclosure also has a high purity. The lignin of the present disclosure may be used in cosmetic composition, such as beauty products, in particular a face cream, more in particular blemish balm (BB) cream.
<a href="#">WO 2023054590</a> <a href="#">A1 20230406</a>	Yakult Honsha KK (JP)	<b>Althaea fermented product and use thereof.</b> Provided is an althaea-derived material that has been improved in order to enhance the activity. The starting material for the fermented product is althaea or a processed material therefrom, and the fermented product is provided by one or two or more microorganisms selected from microorganisms belonging to lactobacilli, microorganisms belonging to genus Lactococcus, microorganisms belonging to genus Leuconostoc, and microorganisms belonging to genus Pediococcus. This fermentation product is useful as, for example, a material to be blended into skin topical agents and cosmetics.



## Bioaditivos alimentarios

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">EP 4186375 A1</a> <a href="#">20230531</a>	ADM Wild Europe GmbH & Co Kg (DE)	<b>Composition and foam.</b> The present invention relates to a composition or foam, comprising soluble dietary fiber, hydrocolloid, emulsifier and oil and/or fat, a food-product additive and a food product comprising the composition or the foam, a foam obtainable from the composition, methods for producing the composition, foam, food-product additive and food product, the use of the composition, foam, or food-product additive in a food product and a container comprising the composition, foam or food-product additive.
<a href="#">WO 2023057609 A1</a> <a href="#">20230413</a>	Bunge Loders Crocklaan BV (NL)	<b>Emulsion and use of a phospholipid composition.</b> The invention relates to use of a plant-based phospholipid composition as emulsifier in an emulsion containing OPO triglyceride, wherein the phospholipid composition has a weight ratio of phosphatidylethanolamine (PE) to phosphatidylinositol (PI) at most 0.70 based on the total amount of polar lipids in the composition. The invention also relates to the stabilized emulsion, as well as infant formula and toddler formula containing the stabilized emulsion.
<a href="#">EP 4197519 A1</a> <a href="#">20230621</a>	DPP Tech Inc (CA)	<b>Preservative compositions and methods of use.</b> Methods are provided for reducing or preventing undesirable changes in a composition over time, such as microbial growth, oxidative damage, and/or color changes. Date palm pollen or an extract thereof serves as a preservative, antimicrobial, and/or antioxidant component, thereby stabilizing the composition.
<a href="#">WO 2023057820 A1</a> <a href="#">20230413</a>	Douxmatok Ltd (IL)	<b>Coated sweetener particles.</b> Sweetener formulations having sweetener-and-polysaccharide coated sweetener particles, and methods for making such formulations and for utilizing them in food products, such sweetener formulations containing coated sweetener particles, each sweetener particle of at least a portion of said sweetener particles having: (a) a sweetener core; (b) a sweetener shell at least partially enveloping said sweetener core; and (c) polysaccharide particles disposed at least within said sweetener shell; wherein CPS-shell is a first average concentration of said polysaccharide particles disposed in an outermost layer of said sweetener coating; wherein CPS-core is a second average concentration of said polysaccharide particles disposed in said coated sweetener particles, radially inward with respect to said outermost layer; and wherein CPS-shell > CPS-core.
<a href="#">EP 4173490 A1</a> <a href="#">20230503</a>	Eti Gıda Sanayi Ve Ticaret Anonim Sirketi (TR)	<b>A functional food ingredient and production method thereof.</b> The invention is related to a functional food ingredient comprising invert sugar and protein to be used in high sugar-containing food products such as cream, chocolate, dragee, fruit-flavored sugar, etc., which provides reducing the use of sugar without affecting the perception of sweetness and reducing the amount of or eliminating natural or artificial sweeteners, and the production method of said food ingredient.
<a href="#">WO 2023072604 A1</a> <a href="#">20230504</a>	Firmenich & Cie (CH)	<b>Composition comprising a nutrient and a taste modulator.</b> The technical field of the present invention relates to a composition comprising a nutrient and a taste modulator. Processes for preparing said composition and consumer products containing said composition are also objects of the invention.
<a href="#">WO 2023052343 A1</a> <a href="#">20230406</a>	Givaudan SA (CH)	<b>Coloring composition.</b> The present invention provides a food colouring composition, in particular the invention provides a composition or colouring composition comprising at least one phycobilin and at least one peptide, polypeptide and/or protein. In certain embodiments, the phycobilin (such as a Phycocyanin) and the at least one peptide, polypeptide and/or protein form a complex.
<a href="#">WO 2023057877 A1</a> <a href="#">20230413</a>	Millbo Srl (IT)	<b>Ingredient for food preservation.</b> The present invention fits into the field of preservation of foods, preferably baked products, and relates to a composition comprising fermented flour obtained from fermentation by means of lactic and/ or propionic acid bacteria, an extract of plant origin, more specifically an extract of Sorbus aucuparia L., and a carrier. The present invention also relates to the use of said composition, preferably in powder form, as an additive for the preservation of foods, preferably baked products. Preferably, the composition of the invention is added to the ingredients for preparing the above-mentioned foods prior to baking.
<a href="#">WO 2023063424 A1</a> <a href="#">20230420</a>	Pharma Foods Int Co Ltd (JP)	<b>Ceramide-containing composition and method for producing same.</b> Provided is a composition containing a ceramide derived from a natural substance. The present invention provides a composition containing a polyphenol and a ceramide. The invention of the present application further provides a composition containing a ceramide derived from wine fermentation lees. Also provided is a method for producing a ceramide-containing composition, the method comprising a step for washing wine fermentation lees and a step for extracting the resulting washing residue using a polar solvent.

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<a href="#">EP 4193844 A1</a> <a href="#">20230614</a>	Univ Wageningen (NL) et al.	<b>Starch addition for improved structure formation in meat analogues.</b> The invention relates to a composition comprising at least one plant-based protein and at least one starch. The invention further relates to a process of texturizing a composition of the invention, to a fibrous structure that is generated by such process, and to an edible product comprising said fibrous structure.

## Bioproductos alimenticios para animales

Nº Publicación	Solicitante (País)	Contenido técnico
<a href="#">EP 4201221 A1</a> <a href="#">20230628</a>	Borregaard AS (NO)	<b>Ruminant feed or supplement for ruminant feed and process for preparing the same.</b> The present invention relates to a process for the production of a ruminant feed or a supplement for a ruminant feed and to a ruminant feed or supplement for a ruminant feed prepared by the inventive process.
<a href="#">WO 2023076707</a> <a href="#">A1 20230504</a>	Bulbow Steve (US)	<b>Pig waste silage.</b> The invention herein is directed to pig waste silage, which is derived from the conversion of pig waste, a fermentable sugar source, and a lactic acid fermentable culture, thereby pig waste is transformed into a nitrogen-rich, crude protein concentrate ingredient, suitable for consumption by cattle, sheep, and goat diets. The pig waste silage of the invention herein is a crude protein source that can lower operational costs for cattle and other ruminant producers, by using less protein-based grains, as well as reduction in greenhouse gas emissions, through a better and more efficient digestion of ruminants, based on physiological principles.
<a href="#">WO 2023081920</a> <a href="#">A1 20230511</a>	Cargill Inc (US)	<b>High plant pufa fish food.</b> Fish feed and methods to increase weight gain in farmed fish comprising providing a feed composition to said fish, wherein said feed composition comprises oil derived from a genetically modified oilseed crop plant, wherein the oil from the genetically modified oilseed crop plant comprises EPA, DHA and DPA.
<a href="#">ES 2938957 A1</a> <a href="#">20230417</a>	Cellbitech SL (ES)	<b>Formulation of a nutritional supplement for animals rich in fatty acids without the use of technological additives.</b> Formulation of a nutritional supplement for animals rich in fatty acids without the use of technological additives. The present invention describes the use of Ocimum basilicum seed and other natural plant components in the formulation of a food supplement for pets without the use of technological additives, where the objective is to improve the quality of life of animals. providing said formulation useful bioactive elements intended to prevent the appearance of different health problems in animals. (Machine-translation by Google Translate, not legally binding)
<a href="#">WO 2023057804</a> <a href="#">A1 20230413</a>	General&Pharma Srl (IT)	<b>Food composition for animals and method of preparation thereof.</b> An instant food composition for animals is reconstitutable by adding water and comprises: a dehydrated vegetable component selected from the group consisting of grains of cereals, grains of quinoa, grains of buckwheat and mixtures thereof, wherein the grains are dehydrated and the outer surface of the grains is at least partially coated with an edible hydrophobic shell; a dehydrated protein component of animal origin; an additional dehydrated vegetable component, other than cereals, quinoa and buckwheat; a dehydrated appetizing component. The composition comprises optionally a functional component. A method for preparing an instant food composition for animals comprises the following steps: mixing a plurality of dehydrated grains of a vegetable component that is selected from the group consisting of cereals, quinoa, buckwheat and mixtures thereof, so as to obtain a mixture; during mixing, spraying an edible hydrophobic composition at a temperature of 40°C onto the mixture; allowing the edible hydrophobic composition to deposit on an outer surface of the grains; allowing the deposited hydrophobic composition to cool down to ambient temperature and solidify on the outer surface of the grains, so as to form an edible hydrophobic shell which at least partially coats the grains; further mixing the grains that are coated with the edible hydrophobic shell with a dehydrated protein component of animal origin, an additional dehydrated vegetable component other than cereals, quinoa and buckwheat, a dehydrated appetizing component and optionally a functional component, so as to obtain the instant food composition for animals.
<a href="#">WO 2023099406</a> <a href="#">A1 20230608</a>	Farmerscent GmbH (DE)	<b>Raw-fiber crusted pellets, feedstuff containing them, and corresponding methods and uses.</b> Described is a raw-fiber crusted pellet comprising one or more feedstuff additives, animal feedstuff comprising a plurality of said raw-fiber crusted pellets, and a method for producing same. Further described is the use of pellets that comprise or consist of vegetable raw fiber sources as substrate pellets for the production of raw-fiber crusted pellets, and the use of feedstuff additives for coating substrate pellets comprising vegetable raw fiber sources.

## Bioproductos alimenticios para animales

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<a href="#">EP 4201222 A1</a> <a href="#">20230628</a>	Nestle SA (CH)	<b>Combination of bornyl acetate and citral for decreasing enteric methane production in ruminants.</b> The present invention relates to a feed supplement/feed additive comprising bornyl acetate and citral. The invention also relates to animal feed comprising the feed ingredients/feed supplement. The animal feed is for decreasing enteric methane production in a ruminant animal, such as cattle.
<a href="#">EP 4193845 A1</a> <a href="#">20230614</a>	Oase GmbH (DE)	<b>Fish feed composition and use thereof.</b> Provided are fish food compositions that include 40-70 wt. % cereal flour, 15-30 wt. % meal from aquatic animals, 10-20 wt. % extraction meal, 0.01-0.40 wt. % pepper, and 0.1-1.0 wt. % free methionine. Also provided are methods for using the fish food compositions as a fish food for ornamental fish.
<a href="#">EP 4159030 A1</a> <a href="#">20230405</a>	Paragon Pet Products Europe BV (NL)	<b>Pet chew and method for producing a pet chew.</b> The present invention relates to a pet chew (100), preferably made substantially of a bioplastic material or composition, more preferably a biodegradable and/or edible bioplastic material or composition, yet more preferably a bioplastic material or composition based on starch or so-called thermoplastic starch (TPS) or polymer starch. The pet chew (100), which may be extrusion moulded, comprises at least a first pet chew body (10) and a second pet chew body (20). The first and second pet chew bodies (10, 20) are formed as elongate bodies, preferably substantially stick-shaped bodies. The first and second elongate pet chew bodies (10, 20) extend substantially parallel to each other and are connected to each other at their lateral sides. The pet chew (100) is arranged such that the first pet chew body (10) and the second pet chew body (20) can be torn apart from each other.
<a href="#">WO 2023108644</a> <a href="#">A1 20230622</a>	Univ Yanbian (CN)	<b>Total mixed fermentation feed having regulated pH value and preparation method thereof.</b> A total mixed fermentation feed having a regulated pH value, comprising a concentrated feed and a coarse feed, the concentrated feed being obtained by preparing a concentrated feed raw material via lactic acid bacterium fermentation, and the coarse feed being obtained by preparing a coarse feed raw material via bacillus megaterium MYB3 fermentation under an alkaline condition; the pH value of the total mixed fermentation feed is 6.00-7.00.

**NIPO: 116-19-007-8**



**Boletín elaborado con la colaboración de:**

**Agencia Estatal  
de Investigación**

C/ Torrelaguna, 58  
28071 Madrid

**Bioplat**

C/ Doctor Castelo 10, 4ºD  
28009 Madrid  
Tel.: 91 074 54 28  
E-mail: [secretaria@bioplat.org](mailto:secretaria@bioplat.org)  
[www.bioplat.org](http://www.bioplat.org)

**CIEMAT**

Avda. Complutense, 40  
28040 Madrid  
Tel: 91 346 08 99  
E-mail: [uip@ciemat.es](mailto:uip@ciemat.es)  
[www.ciemat.es](http://www.ciemat.es)

**OEPM**

Paseo de la Castellana, 75  
28071 Madrid  
Tel: 91 349 53 00  
E-mail: [carmen.toledo@oepm.es](mailto:carmen.toledo@oepm.es)  
[www.oepm.es](http://www.oepm.es)



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