VT BIOMASA PARA LA BIOECONOMÍA 40
NIPO: 116-19-007-8 PATENTES
Vigilancia Tecnológica
2º trimestre 2021

# BOLETÍN BIOENERGÍA Y BIOPRODUCTOS

## Hidrógeno a partir de biomasa: Patentes y proyectos

El hidrógeno es el elemento químico más abundante de la naturaleza. Además, es ligero y muy reactivo, así como un combustible muy eficiente y limpio cuya combustión sólo genera vapor de agua. Por ello, el hidrógeno renovable está llamado a jugar un papel importante en el proceso de descarbonización de la economía. Si se logra abaratar su coste, se prevé que su demanda global alcance los 300 millones de toneladas anuales en 2050.

Además del hidrógeno verde, obtenido por electrólisis del agua mediante el uso de energías renovables, existen otras rutas termoquímicas (gasificación, pirólisis, etc.) y biológicas (fermentación oscura, fotofermentación, biofotólisis, etc.) de obtención de hidrógeno a partir de otra fuente renovable como es la biomasa. En este Apartado se expondrá brevemente cuál es su escenario actual en Europa a partir de la identificación de las nuevas familias de patente de solicitantes europeos incorporadas a las bases de datos de la EPO (European Patent Office) en los últimos años y de los últimos proyectos europeos iniciados en este campo.

Desde enero de 2016 hasta finales de abril de 2021, se han incorporado a las bases de datos a las que tiene acceso la herramienta Global Patent Index (GPI, EPO) 432 nuevas familias de patentes relacionadas con la producción de hidrógeno a partir de biomasa. Tan solo el 4% de ellas pertenecen a instituciones europeas. Éstas se recogen en la Tabla 1, de modo que en los números de publicación aparece un vínculo al documento en espacenet. En la Tabla 1 se distingue cuáles son los organismos solicitantes de las patentes y su país de origen. Puede observarse que ningún solicitante cuenta con más de una familia. Los solicitantes con más solicitudes de patente son la empresa sueca Cortus AB y la alemana iGas Energy GmbH. Alemania es el país de origen más frecuente, existiendo cinco familas cuyo solicitante es alemán. A éste le siguen Países Bajos, Reino Unido y Suiza, de modo que cada uno de ellos es el de procedencia de los solicitantes de dos familias.

**Tabla 1.** Familias de patente de instituciones europeas

| Nº Publicación representante (nº solicitudes) | Título | Solicitante | País del solicitante |
|---|---|---|---|
| WO2019058073A1 (2) | Method for controlling a dark fermentation reactor | Agronomique Inst Nat Rech et al. | Francia |
| WO2018141911A1 (3) | Process for the production of hydrogen | Antecy BV | Países Bajos |
| WO2017115262A1 (3) | Methodology for treating biomass, coal, msw/ any kind of wastes and sludges from sewage treatment plants to produce clean/upgraded materials for the production of hydrogen, energy and liquid fuels-chemicals | Arvelakis Stylanos | Grecia |
| WO2019078713A1 (4) | Method and system for the enhancement of productivity of hydrogenotrophic micro-organisms | Avecom NV | Bélgica |
| WO2019052877A1 (3) | System and method for storing hydrogen extracted from fossil coal or any biomass | Blank Christian | Alemania |
| WO2019229255A1 (1) | Photocatalyst and photocatalytic methods for producing hydrogen | Cambridge Entpr Ltd | Reino Unido |
| US2018201850A1 (1) | Process reacting organic materials to give hydrogen | Cleancarbonconversion Patents AG | Suiza |
| WO2019074431A1 (9) | Process and apparatus for hydrotreatment of pyrolysis oil | Cortus AB | Suecia |
| EP3434382A1 (8) | Fractional deposition of valuable substances from aqueous multi-component mixtures | iGas Energy GmbH | Alemania |
| EP3382030A1 (1) | Method and installation for biogas and hydrogen production, and fertilizers containing chelates obtained by this method | Ignaciuk Henrik et al. | Polonia |
| WO2020200341A1 (2) | Process and apparatus for producing hydrogen from a carbon-containing raw material | Inaco Services GmbH et al. | Suiza/Alemania |
| EP3757193A1 (2) | Method and installation for the treatment of sewage sludge, fermentation residues and / or manure with recovery of hydrogen | 4 Innovation GmbH et al. | Alemania |
| GB2556665A (1) | Methods for hydrogen production | Linde AG | Alemania |
| EP3165503A1 (1) | Process for producing hydrogen and heat and/ or power | Shell Int Research | Países Bajos |
| WO2019115871A1 (3) | Method and apparatus for treating a side water fraction | Teknologian Tutkimuskeskus Vtt Oy | Finlandia |
| WO2020035564A1 (1) | Reduction of the content of carbon monoxide in the feed for steam reformers for hydrogen production | Topsoe Haldor AS | Dinamarca |
| GB2571413A (1) | Methods of manufacturing hydrogen | Univ Coventry | Reino Unido |
| MD20120034A2 (1) | Process for biohydrogen cleaning from impurity gases | Univ de Stat Din Moldova | Moldavia |

La Figura 1 muestra la distribución de las solicitudes totales por ámbito de protección. El 23.4% son solicitudes internacionales PCT y el 19.1% se trata de solicitudes de patente europea. Otros ámbitos de protección destacados son EE.UU. y Alemania, a los que corresponde el 10.6% y 8.5% de las solicitudes, respectivamente.

En la Figura 2 se muestra la distribución del número de familias de patente por sus códigos CPC (Cooperative Patent Classification) más representativos relacionados con el proceso de síntesis de hidrógeno. Su significado se recoge en la Tabla 2. Cabe destacar que la mayoría se dirigen al proceso de gasificación de biomasa, aunque existen algunos relativos al proceso de fermentación oscura (C12M41/32) o al de pirólisis (C10B53/02).

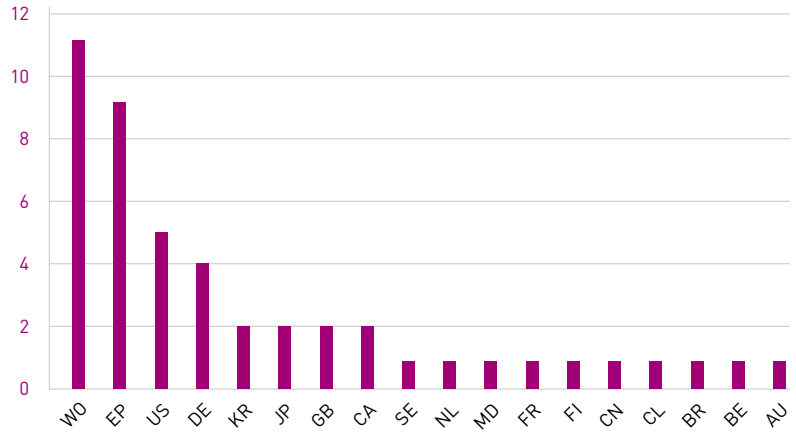


**Figura 1.** Distribución del número de solicitudes por ámbito de protección

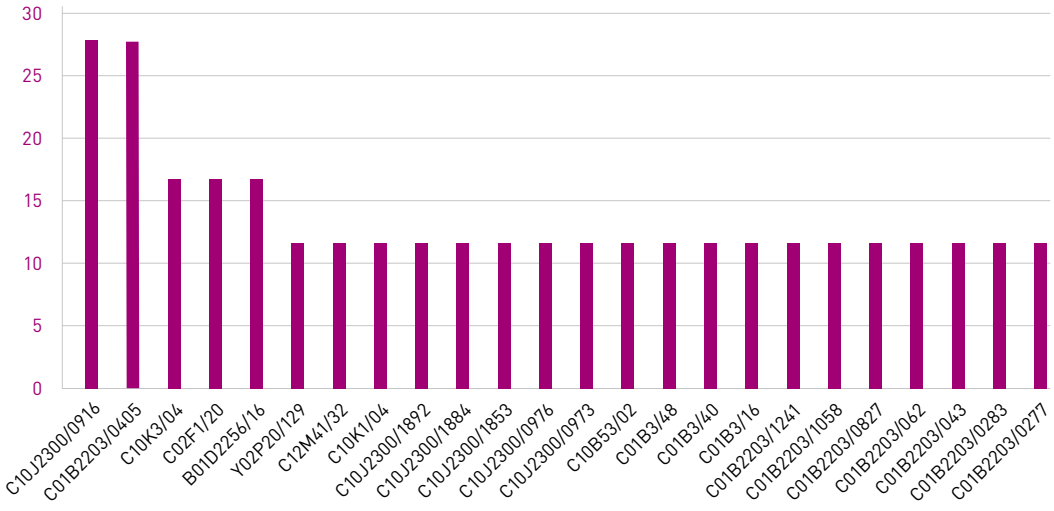


**Figura 2.** Códigos CPC más representativos (nº familias, %)

**Tabla 2.** Significado de los códigos CPC más representativos

| Código CPC | Significado |
|---|---|
| B01D2256/16 | Separation. Hydrogen as the main component in the product gas stream after treatment |
| C01B2203/0277 | Processes for the production of hydrogen or synthesis gas containing a catalytic decomposition step |
| C01B2203/0283 | Processes for the production of hydrogen or synthesis gas containing a CO-shift step, i.e. a water gas shift step |
| C01B2203/0405 | Processes for the production of hydrogen or synthesis gas containing purification step based on a membrane separation gas |
| C01B2203/043 | Processes for the production of hydrogen or synthesis gas containing a purification step. Regenerative adsorption process in two or more beds, one for adsorption, the other for regeneration |
| C01B2203/062 | Processes for the production of hydrogen or synthesis gas integrated with hydrocarbon production, e.g. Fischer-Tropsch process |
| C01B2203/0827 | Processes for the production of hydrogen or synthesis gas. Methods of process heating by combustion of fuel, at least part of the fuel being a recycle stream |
| C01B2203/1058 | Processes for the production of hydrogen. Nickel catalyst |
| C01B2203/1241 | Processes for the production of hydrogen or synthesis gas. Natural gas or methane feed. |
| C01B3/16 | Production of hydrogen or of gaseous mixtures containing a substantial proportion of hydrogen by reaction of water vapour with carbon monoxide using catalysts |
| C01B3/40 | Production of hydrogen or of gaseous mixtures containing a substantial proportion of hydrogen by reaction of hydrocarbons with gasifying agents using catalysts |
| C01B3/48 | Production of hydrogen or of gaseous mixtures containing a substantial proportion of hydrogen by reaction of hydrocarbons with gasifying agents followed by reaction of water vapour with carbon monoxide |
| C02F1/20 | Treatment of water, wastewater or sewage by degassing, i.e. liberation of dissolved gases |
| C10B53/02 | Destructive distillation of cellulose-containing material |
| C10J2300/0916 | Gasification of biomass |
| C10J2300/0973 | Gasifying agents: Water |
| C10J2300/0976 | Gasifying agents: Water steam |
| C10J2300/1853 | Steam reforming gasification process |
| C10J2300/1884 | Details of the gasification process. Heat exchange between at least two process streams with one stream being synthesis gas |
| C10J2300/1892 | Details of the gasification process. Heat exchange between at least two process streams with one stream being water/steam |
| C10K1/04 | Purifying combustible gases containing carbon monoxide by cooling to condense non-gaseous materials |
| C10K3/04 | Modifying the chemical composition of combustible gases containing carbon monoxide to produce an improved fuel, e.g. one of different calorific value, which may be free from carbon monoxide by catalytic treatment reducing the carbon monoxide content , e.g. water-gas shift |
| C12M41/32 | Biofermenters. Means for regulation, monitoring, measurement or control of concentration of substances in solution |
| Y02P20/129 | Climate change mitigation technologies relating to chemical industry. Energy recovery, e.g. by cogeneration, H2 recovery or pressure recovery turbines |

En la Tabla 3 se recogen los proyectos de los programas Horizonte 2020 (H2020) y European Reserach Council (erc) inciados a partir de 2016. En sus títulos aparece un vínculo al documento en CORDIS. Cabe resaltar que, en este caso, van cobrando más peso las iniciativas dirigidas a la utilización de sistemas biológicos para la obtención de hidrógeno (proyectos SE2B, SOLENALGAE y H2BioEnergy). Asismismo, aunque se escapa del alcance de esta introducción, mencionar que van siendo cada vez más numerosos aquéllos en los que se trata de imitar sistemas fotobiológicos tales como los proyectos Nat-HEC, Sol2H2, LuSH Art, BioInspired_SolarH2, etc.

**Tabla 3.** Proyectos de los programas H2020 y erc

| H2020 |
|---|
| BIOROBURplus: Advanced direct biogas fuel processor for robust and cost-effective decentralised hydrogen production |
| **Fecha de inicio:** 01/02/2017 **Fecha de finalización:** 30/06/2021<br>**Coordinador:** Politecnico di Torino (Italia)<br>**Participantes: 10** |
| BL2F: Black Liquor to Fuel by Efficient HydroThermal Application integrated to Pulp Mill |
| **Fecha de inicio:** 01/04/2020 **Fecha de finalización:** 31/03/2023<br>**Coordinador:** Tampereen Korkeakoulusaatio Sr (Finlandia)<br>**Participantes: 11** |
| CH2P: Cogeneration of Hydrogen and Power using solid oxide based system fed by methane rich gas |
| **Fecha de inicio:** 01/02/2017 **Fecha de finalización:** 31/07/2021<br>**Coordinador:** Fondazione Bruno Kessler (Italia)<br>**Participantes: 7** |
| 112CO2: Low temperature catalytic methane decomposition for COx-free hydrogen production |
| **Fecha de inicio:** 01/09/2020 **Fecha de finalización:** 29/02/2024<br>**Coordinador:** Universidade do Porto (Portugal)<br>**Participantes: 6** |
| H2BioEnergy: Operando FTIR spectro-electrochemistry of hydrogenases: unraveling the basis of biological H2 production for innovative clean energy technologies |
| **Fecha de inicio:** 01/01/2018 **Fecha de finalización:** 07/01/2020<br>**Coordinador:** The Chancellor Masters and Scholars of the University of Cambridge (Reino Unido)<br>**Participantes: 6** |
| HYDROGAS: Catalytic Reforming of Glycerol to Hydrogen and Biopropane in Hydrothermal Media |
| **Fecha de inicio:** 01/09/2021 **Fecha de finalización:** 30/11/2022<br>**Coordinador:** Aston University (Reino Unido)<br>**Participantes: 1** |
| SE2B: Solar Energy to Biomass - Optimisation of light energy conversion in plants and microalgae |
| **Fecha de inicio:** 01/03/2016 **Fecha de finalización:** 31/08/2020<br>**Coordinador:** Johann Wolfgang Goethe-Universitaet Frankfurt am Main (Alemania)<br>**Participantes: 11** |
| SWITCH: smart ways for in-situ totally integrated and continuous multisource generation of hydrogen |
| **Fecha de inicio:** 01/01/2020 **Fecha de finalización:** 31/12/2022<br>**Coordinador:** Fondazione Bruno Kessler (Italia)<br>**Participantes: 6** |
| TO-SYN-FUEL: The Demonstration of Waste Biomass to Synthetic Fuels and Green Hydrogen |
| **Fecha de inicio:** 01/05/2017 **Fecha de finalización:** 30/09/2022<br>**Coordinador:** Fraunhofer Gesellschaft zur Foerderung der Angewandten Forschung E.V. (Alemania)<br>**Participantes: 12** |
| Waste2H2: Waste to Hydrogen |
| **Fecha de inicio:** 01/01/2021 **Fecha de finalización:** 31/12/2023<br>**Coordinador:** Instituto Politécnico de Portalegre (Portugal)<br>**Participantes: 3** |

| erc |
|---|
| SOLENALGAE: Improving photosynthetic solar energy conversion in microalgal cultures for the production of biofuels and high value products |
| **Fecha de inicio:** 01/03/2016 **Fecha de finalización:** 31/03/2023<br>**Coordinador:** Universita degli Studi di Verona (Italia)<br>**Participantes: 2** |
| SolReGen: Solar-driven reforming of waste into hydrogen |
| **Fecha de inicio:** 01/10/2021 **Fecha de finalización:** 31/03/2023<br>**Coordinador:** The Chancellor Masters and Scholars of the University of Cambridge (Reino Unido)<br>**Participantes: 12** |

# PATENTES BIOENERGÍA

| Biocombustibles sólidos (pellets, biochars, bio RDFs, bio SRFs, etc.) | | |
|---|---|---|
| Nº Publicación | Solicitante (País) | Contenido técnico |
| WO2021097218 | Crawford Curtis S et al. (US) | **Reactor for biomass processing.** An system for processing biomass comprising a stator, a rotor having an axis of rotation, the rotor being disposed inside the stator and configured to rotate about the axis of rotation therein, a processing chamber defined between the rotor and the stator, an inlet in fluid communication with the processing chamber which is designed to introduce unprocessed biomass into the processing chamber, an outlet in fluid communication with the processing chamber which is designed to carry out processed biomass from the processing chamber and a pump operationally associated with the inlet and the outlet, wherein the pump is configured to pump the unprocessed biomass through the processing chamber. |
| WO2021096780 | Ecogensus LLC et al. (US) | **Mobile solid fuel production system.** A fuel production system includes a first modular unit and a second modular unit. The first modular unit includes a first housing, a process vessel, an agitator rotor assembly, a first drivetrain, an extrusion screw, a second drivetrain, a first separation vessel, and a product shaping system. The second modular unit includes a second housing, a thermal fluid heater system, a condenser, a second separation vessel, and a vacuum pump. The second modular unit is configured to be coupled to the first modular unit. At least a portion of each of the process vessel, the agitator rotor assembly, the first drivetrain, the extrusion screw, the second drivetrain, the first separation vessel, and the product shaping system are contained in the first housing. At least a portion of each of the thermal fluid heater system, the condenser, the second separation vessel, and the vacuum pump are contained in the second housing. |
| WO2021076022 | Gribenyuk andrey semenovich (RU) | **Fire-lighting means and method of manufacturing same.** The present invention relates to fire-lighting means comprising a plurality of twisted fibres of wood fuel material coated with paraffin. The present invention can be used to facilitate the ignition of wood, coal and other fuel materials in furnaces, chimneys, bonfires and so forth. According to the invention, the twisted fibres of the wood fuel material are wound onto an oil-impregnated wick which consists of a number of interconnected hemp cord fibres, wherein the fire-lighting means is also coated with sunflower oil. The technical result achieved is to increase the burning time of the fire-lighting means with an increase in durability. |
| WO2021099907 | Gulas Pavel (SK) | **High-energy solid fuel from plastic waste.** High-energy solid fuel from plastic waste consisting of the mixture of thermosets, thermoplastics, and catalysts, having heating value from 17 to 30 GJ/kg depending on volume and type of the thermoplastic used. Preferably, sorted plastic waste is to be used as thermoplastic, e.g. polyethylene sacks, foils, and bags having heating value over 40 GJ/kg, and the plant biomass as the source of thermoset. The catalysts may be added to the mixture of thermosets and thermoplastics in the form of finely pulverized minerals, or may be provided by any suitable combination of various types of the biomass. Combustion of the high-energy solid fuel achieves much higher heating value, higher flame temperature, and fewer toxic emissions are generated. |
| WO2021097554 | Nat Res Council Canada (CA) | **Wood pellets and binder therefor.** A binder for a wood pellet comprises a lignosulfonate and an aqueous acid solution in a weight ratio of 1:1 to 1:4 lignosulfonate : aqueous acid solution. The wood pellet has wood biomass bound into the pellet with 6-24 wt% of a binder, based on total weight of the pellet, and has 2-6 wt%, based on total weight of the pellet, of a hydrophobic agent impregnated into the pellet. The wood pellet exhibits a desirable balance between mechanical durability and water repellency. The wood pellet may be used as a combustible fuel. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| EP3835393 | Warezak Tomasz (PL) | **Brown coal pellets.** The object of this invention is a pellet based on lignite and waste wood, usable as an energy material in the form of a solid fuel. Lignite-based pellet is characterized in that the mass fractions of lignite and wood chips are in the range of 75-95 wt% and 5-25 wt%, respectively. |
| WO2021089827 | Xare Invest BV (NL) | **Method and system for generating combustible material from organic waste containing a majority of herbaceous plants.** The invention relates to a method for treating organic waste containing a majority of herbaceous plants, in particular of the family of grasses or poaceae, preferably at least 60%, such as animal manure and more specifically horse manure, for the preparation of combustible material, characterized in that said method involves the following steps: - a first step of drying organic matter containing a majority of herbaceous plants by blowing hot air, in particular at a temperature of 60 to 120°C, until the organic matter has a dry mass of 60% to 80%; - a separation step in a densimetric separator to extract a dried herbaceous portion from the dried organic matter; - a second drying step applied to the dried herbaceous portion until the herbaceous portion contains 85% to 95% of dry mass; - a step of grinding the dried herbaceous portion from the second drying step in a mechanical mill into particles having a size of less than 20 mm, preferably between 5 and 15 mm, in order to mechanically split the lignin protection of the cell walls; - a step of pressing (209) the dried, ground herbaceous portion into pellets in a pellet press. |

## Syngas

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| WO2021061171 | Aries Gasification LLC (US) | **Method for gasifying feedstock with high yield production of biochar.** A downdraft gasifier and method of gasification with high yield biochar that utilizes a plurality of high throughput, vertically positioned tubes to create a pyrolysis zone, an oxidation zone beneath the pyrolysis zone and a reduction zone beneath the oxidation zone. A rotating and vertically adjustable rotating grate is located beneath the reduction zone of the gasifier. In addition, a drying zone is located above the pyrolysis zone so the heat of the gasifier can be used to dry feedstock before it enters the gasifier. By optimizing the grate height and rpm, feedstock retention time in the drying zone, the drying zone temperature and feedstock moisture content, the result is gasification of biomass with a high yield and continuous biochar production. |
| EP3828465 | Commissariat Energie Atomique (FR) | **Solar reactor with jet, intended for the thermochemical conversion of a carbonaceous filler, with improved discharge of ash, method for operation thereof, application to gasification of biomass or reforming.** The invention relates to a solar reactor comprising a casing delimiting a reaction chamber, the casing comprising a lower part in the form of a right cone extended at its top by an inlet and an upper part in the form of a straight blind cylinder, at least part of the casing being intended to receive solar radiation, the cone and / or the side surface of the blind cylinder comprising two lateral bores, one of which is extended by a tube for injecting solid reagents and the other is extended by a tube for output of products resulting from the reaction, the inlet comprising two tubes coaxial, of which the central one is intended for the injection of at least the majority of the gaseous reactants, while the peripheral one is intended for the injection of an auxiliary drive gas and for recovery by gravity ash from the reaction. |
| WO2021084016 | Cramwinckel Michiel (NL) | **Process for a plastic product conversion.** The invention is directed to a process for a combined biomass and plastic product conversion by subjecting a moulded product comprising of between 1 and 20 wt% of a plastic product and between 99 and 80 wt% of a torrefied biomass to a pyrolysis or mild gasification thereby obtaining a gaseous fraction comprising hydrogen, carbon monoxide and a mixture of gaseous organic compounds and a char product. |
| WO2021108395 | Energy & Environmental Res Center Foundation et al. (US) | **Char preparation system and gasifier for all-steam gasification with carbon capture.** An ASG system for polygeneration with CC includes a devolatilizer that pyrolyzes solid fuel to produce char and gases. A burner adds exothermic heat by high-pressure sub-stoichiometric combustion, a mixing pot causes turbulent flow of the gases to heat received solid fuel, and a riser micronizes resulting friable char. A devolatilizer cyclone separates micronized char by weight providing micronized char, steam and gases to a gasifier feed and oversized char to the mixing pot. An indirect fluid bed gasifier combustion loop includes a gasifier coupled to the feed, a steam input to provide oxygen for gasification and to facilitate sand-char separation, and an output for providing syngas. A burner provides POC to a mixing pot which provides hot sand with POC to a POC cyclone via a riser, where the POC cyclone separates sand and POC by weight and provides POC and sand for steam-carbon reaction. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| WO2021087618 | Expander Energy INC (CA) | **Process for producing synthetic hydrocarbons from biomass.** A process for preparing synthetic hydrocarbons from a biomass feedstock is provided. The process involves electrolyzing water in an electrolyzer to produce oxygen and hydrogen, using the generated oxygen to gasify a biomass feedstock under partial oxidation reaction conditions to generate a hydrogen lean syngas, adding at least a portion of the generated hydrogen to the hydrogen lean syngas to formulate hydrogen rich syngas, which is reacted a Fischer Tropsch (FT) reactor to produce the synthetic hydrocarbons and water. At least a portion of the water produced in the FT reaction is recycled for use in the electrolysis step, and optionally using heat generated from the FT reaction to dry the biomass feedstock. |
| WO2021078517 | Forschungszentrum Juelich GmbH (DE) | **Production of a synthesis gas comprising carbon monoxide and hydrogen.** The invention relates to a method for producing a synthesis gas comprising carbon monoxide and hydrogen, comprising: a) providing a feedstock gas comprising methane and carbon dioxide, b) converting the feedstock gas into an intermediate product gas comprising carbon dioxide and water vapor and c) converting the intermediate product gas obtained in step b) into the synthesis gas comprising carbon monoxide and hydrogen by means of electrolysis. A synthesis gas comprising carbon monoxide and hydrogen can be obtained from biogas with particularly high efficiency by means of the described method and the described apparatus. To this end, the conversion of the biogas in a fuel cell is coupled with co-electrolysis in an electrolysis cell. |
| WO2021101603 | Massachusetts Inst Technology (US) | **Startup and shutdown of cleanup engine and other components in a biomass conversion system.** An integrated biomass conversion system and a method of starting and shutting down the system are disclosed. The integrated biomass conversion system comprises a syngas generator, such as a gasifier, a cleanup engine and a syngas utilization system, which could be a power producing engine or a chemical reactor for chemical or fuel synthesis. The cleanup engine operates rich and at high temperatures so that the tars exhausted by the syngas generators are destroyed and not allowed to foul other components. An orderly sequence to start and shut down the integrated biomass conversion system is disclosed. |
| WO2021102519 | Melbourne Inst Tech (AU) | **A system and method for pyrolysis.** The invention provides a system for pyrolysis, comprising: (i) a gas producer comprising a gasification zone and a producer gas outlet, wherein the gas producer is configured to: oxidise at least one carbon-containing feed in the presence of an oxidising gas in the gasification zone to form a producer gas; and discharge the producer gas from the gasification zone via the producer gas outlet, wherein a residual oxygen content of the producer gas is substantially depleted or maintained below a maximum predetermined amount by controlling a ratio of oxygen fed to the gasification zone to the carbon-containing feed, (ii) a pyrolyzer comprising a pyrolysis zone and one or more pyrolyzer gas outlets, wherein the pyrolyzer is configured to: feed the producer gas discharged from the gasification zone to the pyrolysis zone; pyrolyze a pyrolyzable organic feed in the pyrolysis zone in the presence of the producer gas to produce a carbonaceous pyrolysis product and a gas mixture comprising combustible components comprising pyrolysis gas; and discharge the gas mixture from the pyrolysis zone via the one or more pyrolyzer gas outlets, and (iii) a first combustor comprising a combustion zone, wherein the first combustor is configured to: receive the gas mixture discharged from the pyrolysis zone in the combustion zone; feed an oxygen-containing gas to the combustion zone; and combust at least a portion of the combustible components present in the gas mixture in the combustion zone to produce a combustion product gas. |
| WO2021102521 | Melbourne Inst Tech (AU) | **A method and system for pyrolysis and carbon deposition.** The invention provides a method of sequential pyrolysis and carbon deposition to produce a composite carbonaceous product, the method comprising: a pyrolysis process step comprising pyrolyzing a pyrolyzable organic feed at a pyrolysis temperature in a first reaction zone in the presence of a non-oxidising gas to produce hot char and pyrolysis gas, wherein the pyrolysis gas and the non-oxidising gas combine to form a gas mixture; discharging the gas mixture from the first reaction zone to a combustion zone and combusting at least a portion of the pyrolysis gas therein, wherein heat produced by the combusting of the pyrolysis gas is transmitted from the combustion zone to the first reaction zone to provide at least a portion of the heat of pyrolysis; and a decomposition process step comprising contacting a hydrocarbon-rich organic gas with the hot char directly after its production in the pyrolysis process step, wherein the hydrocarbon-rich organic gas catalytically decomposes on the hot char at a decomposition temperature which is higher than the pyrolysis temperature, thereby producing gaseous decomposition products comprising hydrogen and a composite carbonaceous material comprising the char with carbon deposits thereon. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| WO2021087542 | Next Generation Elements GmbH (AT) | **Method for thermo-chemical treatment of a gasification material.** The invention relates to a method for thermo-chemical treatment of gasification material by means of a pyrolysis reactor, in which, by means of a heating device, a first quantity of heat (QExt) is introduced into a reactor interior and said reactor interior is heated directly. A gaseous oxidation agent is also supplied to the reactor interior per unit of time during treatment. The quantity of the gaseous oxidation agent is set such that a sub-stoichiometric reaction of the gasification material occurs at a lambda value selected from a value range having a lower limit of 0.01 and an upper limit of 0.5. A second quantity of heat (QInt) is generated in addition to the first quantity of heat (QExt), wherein the provided first quantity of heat (QExt) is reduced at most by the magnitude of the second quantity of heat (QInt) per unit of time. |
| WO2021090090 | Reset SRL (IT) | **Integrated plant for the in situ production of thermal energy from biomass.** Integrated plant for the in situ production of thermal energy from biomass, said integrated plant comprising at least a first module for the formulation of said starting biomass into briquettes with predefined dimensional characteristics, said module in turn comprising at least a section for storing, screening, crushing, drying and briquetting said biomass; said integrated plant further comprising at least a second module for the controlled transport of the biomass, as formulated in said first module, inside at least a third module which is an integral part of said plant and which in turn comprises at least a gasification reactor for converting said formulated biomass into syngas briquettes, said third module further comprising at least a cyclone system for the recovery of possible powders, at least a system for the recovery of the condensates and at least a system for the filtration of the biomass, said plant comprising at least an emergency torch and being characterised in that it comprises at least a fifth module comprising at least a boiler for the production of an energy carrier. |
| EP3819359 | Syncraft Eng GmbH (AT) | **Method and device for adjusting the fill level in a floating bed reactor.** The invention relates to a method for adjusting the fill level in a gasifier for carbonaceous material in the form of a fluidized bed reactor in which biomass and / or coke (K) is converted into a product gas, the method comprising the following steps. Providing a substantially conical, downwardly tapering, fluidized bed reactor, with an upper reactor ceiling and a lower inlet opening into the biomass and / or coke (K) from below and a gaseous gasification agent (V) upwards is introduced into the fluidized bed reactor, so that within the conical reactor a, lifted from the location of the inlet opening, suspended fixed bed is formed, wherein the flow rate of the gaseous gasification agent together with the biomass and / or the coke (K) is adapted to the shape of the flow cross-section of the conical reactor, taking into account the material properties of the biomass and / or the coke, that a stable bed is formed in the reactor which is kept in suspension. |
| WO2021091812 | Thiessen Randall J et al. (US) | **Burner tube.** A system and method uses a combustor and gasifier to burn a primary dirty fuel, such as waste materials or high-polluting fossil fuels, and a secondary low-polluting fuel, such as biomass fuels, for co-generation of electricity while reducing harmful emissions. The primary fuel is burned at least partially through the use of an improved burner tube. Dirty exhaust from a combustor is scrubbed by a gasifier by reforming the combustors exhaust gases into a clean-burning producer gas (syn-gas). The secondary fuel and oxygen are added to the dirty exhaust in the gasifier to create gas, char and ash. The gas powers an engine or turbine that turns a generator, or a boiler, Stirling engine, or Organic Rankine Cycle power plant, and releases a cleaner exhaust. |

## Biogás

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| EP3831462 | AB Impianti SRL (IT) | **Plant and method for the separation of a gas mixture containing a plurality of components, in particular for obtaining biomethane.** Plant and method for the separation of a gas mixture containing a plurality of gaseous components, comprising first and second membrane-based separation stages and a third gas separation stage with adsorption with oscillating pressure, which first, second and third gas separation stages acting in combination make it possible to obtain a first final flow of gas enriched in a first component of the initial gas mixture, for example methane, and a second final flow of gas, enriched in a second component of the initial gas mixture, for example carbon dioxide. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| EP3835404 | Air Liquide (FR) | **Digester comprising a combined desulphurisation net with hanging strings.** Installation for the production of at least partially desulfurized biogas comprising a digester and / or a biomass post-digester, the digester and / or the post-digester comprising: - An enclosure in which anaerobic digestion of the biomass takes place, resulting in the production of biogas and digestate, - A means of introducing an oxidation gas, - A desulphurization net placed horizontally and fixed in the upper part of the enclosure, and - Ropes attached to said desulphurization net and which hang down to the biogas-digestate interface. |
| EP3835406 | Air liquide (FR) | **Digester comprising an internal wall with expansions and/or hollows.** Installation for the production of at least partially desulphurized biogas comprising a digester and / or a biomass post-digester, the digester and / or the post-digester comprising: - An enclosure comprising the biomass and the gas overhead, and - A means of introduction of an oxidation gas, characterized in that the portion of the internal wall of the enclosure situated at the level of the gas overhead exhibits expansions and / or hollows. |
| WO2021089918 | BGCNordic OY (FI) | **Biogas reactor and methods for producing biogas and manufacturing biogas reactor.** The invention concerns a biogas reactor, in which biogas is arranged to be formed from organic matter. The biogas reactor includes a wall arranged to form a tank structure, a tubular reactor space arranged inside the tank structure, in which the organic matter can be placed to form biogas, a hollow space for a heat-transfer medium, in order to influence the temperature of the organic matter to be placed in the reactor space, connections for feeding organic matter to the reactor space and removing it from the reactor space, and one or more connections for removing biogas from the reactor space. The wall arranged to form the tank structure is arranged to form from hollow pipe profile arranged in a spiral arrangement by helical winding to form a double-layer structure from the said wall. In addition, the said wall arranged to form the tank structure is arranged to form the said hollow space for the heat-transfer medium. In addition, the invention also concerns methods for producing biogas and for manufacturing a biogas reactor. |
| WO2021055799 | Breakthrough Tech LLC (US) | **Ultrasonification for biogas. An ultrasonification system is provided.** The ultrasonification system includes a duct having a proximal end and a distal end, and a vibrating head disposed within the duct near the proximal end thereof. A fluid enters the duct from the proximal end and flows toward the distal end. Related apparatus, systems, techniques, and articles are also described. |
| WO2021059554 | Fujita Corp (JP) | **Biogas generation device.** This biogas generation device is provided with: a treatment tank; a biological sludge bed disposed at a lower portion of the inside of the treatment tank; and a sludge sedimentation body that is disposed above the biological sludge bed and that has an inclined surface opposing the biological sludge bed, wherein the sludge sedimentation body can be moved inside of the treatment tank in the vertical direction. The treatment tank may have a guide rail for moving the sludge sedimentation body along an inner wall of the treatment tank. The sludge sedimentation body may have: a body part having an inclined surface; and a rectification part including a plurality of tubular structures that are disposed on an upper surface of the body part. |
| WO2021113622 | Jacobs Eng Group Inc (US) | **System and methods for improved anaerobic digestion.** The present disclosure relates generally to systems and methods for improving performance of anaerobic digestion by post-anaerobic digestion processing. The post- anaerobic digestion processing includes introducing a digestate to post-anaerobic digestion microorganisms downstream of an anaerobic digestion process, wherein the digestate is a product of anaerobic digestion and the post-anaerobic digestion microorganisms hydrolyze and ferment the digestate to produce hydrolysis and fermentation products. In some instances, the systems and methods further include introducing the hydrolysis and fermentation products to anaerobic digestion microorganisms, wherein the anaerobic digestion microorganisms convert the hydrolysis and fermentation products into biogas. |
| WO2021085530 | Kobelco Eco Solutions Co Ltd (JP) | **Biomass treatment method and biomass treatment equipment.** Provided is a biomass treatment method comprising: a pretreatment step in which, in a substance to be treated containing biomass that includes refractory organic matter and rumen microorganisms that are derived from a ruminant animal, easily fermented constituents are produced from the refractory organic matter; a methane fermentation step in which at least part of the substance to be treated containing the easily fermented constituents is subjected to dry methane fermentation treatment; and a fermentation residue feeding step in which at least part of fermentation residue produced in the methane fermentation step is fed to the substance to be treated in the pretreatment step. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| EP3831921 | Mieth Hans Otto (DE) | **Biogas reactor and method for its operation and fermentation stage.** The present invention relates to a biogas reactor comprising: - a cylindrical pressure vessel which has at least one fermentation zone, a substrate overflow and a biogas collection zone in its interior, - at least one storage tank for storing raw substrate, - at least one raw substrate supply line, which leads from the storage container into the fermentation zone of the cylindrical pressure vessel, - at least one biogas extraction line for discharging the resulting Biogas and at least one recycling container, which is arranged below the cylindrical pressure vessel and is connected to the overflow pipe via a recyclable material collecting line, the substrate overflow of the overflow pipe is positioned at least in the upper half of the cylindrical pressure vessel. The present invention also relates to a method for operating this biogas reactor. Finally, the present invention relates to a final fermentation stage for biogas reactors and biogas plants. |
| WO2021110419 | Saxe Paris Investissement (FR) | **Improved Methanization Unit.** The present invention relates to a batch dry methanization unit comprising a charging space intended to receive a biomass to be methanized, the methanization unit comprising a percolation means, and a means for discharging a percolate. - the methanization unit comprises at least one first filter arranged so as to separate the charging space from a circulation space, - the circulation space being located between the first filter and the discharging means, - a second filter being arranged between the circulation space and the discharging means, said second filter being configured to be finer than the first filter, so as not to let through certain elements that the first filter lets through. The present invention further relates to a percolation process of a batch dry methanization unit successively comprising the following steps: - pouring a percolation liquid onto a biomass, said percolation liquid becoming a percolate by passing through the biomass, - filtering the percolate) through a first filter, - filtering the percolate through a second filter finer than the first filter , - discharging the percolate (5) out of the methanization unit. |
| WO2021075148 | Unicharm Corp (JP) | **Production method for biogas using used sanitary articles.** Provided is a biogas production method that enables efficient production of a biogas from waste matter derived from used sanitary articles. This method is for producing a biogas using waste matter derived from used sanitary articles containing highly water-absorbent polymers, pulp fibers, synthetic resin materials, and excreta. This method comprises a crushing step (S1) for crushing used sanitary articles in an inactivation aqueous solution that can inactivate highly water-absorbent polymers, a forming step (S2) for separating highly water-absorbent polymers, pulp fibers, and synthetic resin materials from the inactivation aqueous solution containing the crushed used sanitary articles, to form a treatment liquid containing a decomposition product of the highly water-absorbent polymers and excreta, and a biogas production step (S3) for producing a biogas using the treatment liquid. |
| WO2021089822 | Xare Invest BV (NL) | **Method and system for generating raw material for anaerobic digestion systems from organic waste containing a majority of herbaceous plants.** The invention relates to a method for treating organic waste containing a majority of herbaceous plants for the preparation of raw material for an anaerobic digestion unit. The method comprises the following steps: - a first drying step, - a separation step - a second drying step, - a grinding step, - a pressing step. |

## Bioalcoholes (bioetanol, biometanol, etc.)

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| US2021131031 | Granbio Intellectual Property Holdings LLC (US) | **Processes and systems for biomass impregnation.** Some variations provide a process for impregnating a biomass feedstock with a reaction solution, comprising: providing a biomass feedstock that contains non-condensable gases within biomass pores; introducing a condensable vapor into the biomass pores to remove non-condensable gases out of the biomass pores, thereby generating an intermediate biomass material, wherein at least a portion of the condensable vapor remains within the biomass pores; exposing the intermediate biomass material to a liquid solution to infiltrate the liquid solution into the biomass pores and condense the vapor to form a condensed liquid contained within the biomass pores, thereby generating an impregnated biomass material containing a reaction solution; and recovering or further processing the impregnated biomass material. The non-condensable gases may be oxygen, nitrogen, or carbon dioxide, for example. The condensable vapor may be steam, for example. The reaction solution may contain a pretreatment chemical, such as a catalyst and/or a solvent. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| CN112501213 | Harbin Inst Technology (CN) | **Cathodic electric fermentation method for preparing hydrogen and butanol by electron transfer mediator enhanced clostridium beijerinckii fermentation.** The invention discloses a cathodic electric fermentation method for preparing hydrogen and butanol by electron transfer mediator enhanced clostridium beijerinckii fermentation, and belongs to the technical field of clean energy production through microbial fermentation. The method solves the problems of low butanol output and yield, failure in transformation from an acid producing phase to a solvent producing phase and relatively high acetone proportion in a solvent in a butanol fermentation process for existing clostridium beijerinckii. According to the invention, the butanol is prepared by clostridium beijerinckii fermentation in a cathodic electric fermentation system; and by introducing electrodes and adding exogenous electron transfer mediator neutral red (NR), a fermentation environment can be controlled and optimized, original NAD+/NADH balance of cells can be changed, shunting of different ways in microbial metabolism can be significantly optimized, more carbon and electrons ina microbial metabolism path are induced to flow to a butanol synthesis path, the output and yield of the biobutanol are improved, and more hydrogen is generated at the same time. |
| WO2021105212 | Katholieke Univ Leuven K U Leuven R&D et al. (BE) | **Means and methods to modulate acetic acid tolerance in industrial fermentations.** The present invention relates to the field of fermentation, more particularly to ethanol production. Even more particularly the present invention relates mutant alleles and chimeric genes useful to engineer the acetic acid tolerance in yeast. These yeast strains are particularly useful in the production of bioethanol based on both first- and second-generation substrates. |
| KR20210028504 | Korea Inst Ocean Sci & Tech (KR) | **AWRP Novel strain of Clostridium sp. AWRP and method for selectively producing bio-alcohol using the same.** The present invention relates to a novel strain AWRP of the genus Clostridium and a method for selectively producing bio-alcohol from synthesis gas using the same. Clostridium AWRP (Accession No.: KCTC 13908BP) strain of the present invention does not inhibit cell growth due to acetic acid accumulation during the culture period, and it is possible to produce high concentration of bioethanol. Therefore, it can be usefully used in the process of selectively producing bioethanol from synthesis gas using the new strain AWRP of the genus Clostridium of the present invention. |
| KR20210039115 | Myongji Univ Industry and Academia Cooperation Foundation et al. (KR) | **Transformed Saccharomyces cerevisiae having improved productivity of bio-ethanol and use thereof.** The present invention relates to a recombinant vector comprising the AGAH71 gene sequence represented by SEQ ID NO: 1, the AGAG1 gene sequence represented by SEQ ID NO: 2 and the NABH558 gene represented by SEQ ID NO: 3 for constructing a single enzyme saccharification and fermentation system. In the case of producing ethanol from agarose through the recombined Saccharomyces cerevisiae strain of the present invention, pretreatment of biomass (substrate) is not required and saccharification and fermentation processes are unified to achieve uniformity of the process and by presenting the possibility of simplification, it can be applied to various fields of producing ethanol from biomass. |
| WO2021066695 | Sharetex AB (SE) | **Process for manufacturing organic chemicals and/or distillate hydrocarbon fuels from waste textiles.** The present disclosure relates to a process for manufacturing organic chemicals and/or distillate hydrocarbon fuels from waste textiles comprising cellulosic fibers, wherein the process includes providing waste textiles comprising cellulosic fibers, processing the waste textiles into an aqueous slurry of comminuted waste textiles, saccharification of the comminuted waste textiles into monomer sugars in the presence of a catalyst; and processing the monomer sugars into organic chemicals and/or distillate hydrocarbon fuels. |
| KR20210054723 | Univ Sejong Ind Acad Coop Foud (KR) | **Method for producing bio alcohol from intermediate products of anaerobic digestion tank.** The present invention is a method capable of producing bioalcohol by reacting a mixture of volatile fatty acids and methanol at 280°C to 400°C in a reactor in the presence of a Group 2 alkaline earth metal catalyst or a Group 11 transition metal catalyst based on a support. |

| Biodiésel | | |
|---|---|---|
| Nº Publicación | Solicitante (País) | Contenido técnico |
| WO2021083435 | Ecopetrol SA (CO) | **Process for removing polar components to improve biodiesel performance at low temperatures.** The present invention describes a process which guarantees the removal of the insoluble polar pollutants present in biodiesel that give rise to the formation of precipitates at temperatures above cloud point and dramatically affect its performance at low temperatures. The biodiesel obtained through the process described in the present invention guarantees that the strictest requirement is fulfilled in international legislation for cold filtration, thereby guaranteeing the production of high-quality industry-grade biodiesel. The process consists basically of two steps: the first is adsorption in a reactor batch and the second is the transfer of the polar chemical components left over from the first step. In both steps, a natural or acid-activated aluminosilicate is used as an adsorbent. |
| WO2021106619 | Fujitusyo Co Ltd et al. (JP) | **Bio-fuel production method using flow-type reaction device.** To enable mass-production of a bio-fuel that is suitable for a diesel engine such that the free fatty acid conversion rate is high and the triglyceride conversion rate is kept low by using a flow-type reaction device in a bio-fuel production method which involves reacting a lower alcohol with a raw material oil containing a free fatty acid in the presence of a solid acid catalyst. A bio-fuel production method performed at a lower alcohol-to-raw material oil mass ratio of 0.12 to 0.8, a reaction temperature of 170°C to 300°C, and a liquid hourly space velocity (LHSV) of 0.5 (h-1) to 6 (h-1), using as a solid acid catalyst a catalyst selected from among an SiO2/Al2O3-based solid acid catalyst, an SiO2/Al2O3-based solid acid catalyst comprising mesoporous silica having portions into which aluminum is introduced, and an Al2O3/B2O3-based solid acid catalyst. |
| DE102019130655 | GEA Mechanical Equipment GmbH (DE) | **Method for reducing the content of monoglycerides in a crude biodiesel.** A method for reducing the content of monoglycerides MG in a crude biodiesel RB produced by transesterification of oil in the presence of methanol, which after transesterification has a content of monoglycerides MG between 0.4 to 0.7% by weight, a content of methanol greater than 0.7% by weight and of free fatty acids FFA of less than or equal to 0.25% by weight, characterized by the following steps: A providing the raw biodiesel RB with the aforementioned ingredients in the aforementioned concentrations; B Addition 1 of an alkaline-aqueous solution L in the form of sodium hydroxide solution to the raw biodiesel RB, the NaOH concentration in the sodium hydroxide solution being less than 4.03 mol / l and the amount of sodium hydroxide solution added between 1.0 and 3, 0 wt .-% based on the amount of raw biodiesel RB and the temperature of the raw biodiesel RB during the addition of the alkaline-aqueous solution L is at least 50 ° C, for the raw biodiesel RBC mixing the alkaline-wä Aqueous solution L by means of a mixer, in particular a dynamic mixer, with hydrolysis of glycerides in biodiesel, preferably of monoglycerides MG, D First centrifugal separation 2 of a heavy phase 6 comprising the alkaline-aqueous solution L with the hydrolyzed ingredients of a light phase 7 comprising the Biodiesel through a separator at a speed of 4400 to 7200 rpm. |
| CN112592767 | Guizhou Jinjiang Bioenergy Tech Co Ltd (CN) | **Device and method for continuously producing biodiesel.** The invention provides a device and a method for continuously producing biodiesel. The method take waste oil as a raw material and adopt the biodiesel continuous production device for production and processing, and the production process comprises the following steps: firstly, dehydrating, deslagging and preheating waste oil, then mixing treated waste oil with glycerol in proportion, carrying outtwo-stage esterification reaction in an esterification series reaction device, tn the reaction process, performing dehydration in real time to promote the esterification reaction process, after esterification reaction is completed, subjecting a feed liquid to flash evaporation to remove glycerol and a small amount of fatty acid, performing transesterification in a transesterification series reaction device, after the transesterification is completed, subjecting the feed liquid to flash evaporation to remove methyl alcohol, then performing standing sedimentation separation to remove glycerol, and rectifying and refining the obtained crude biodiesel to obtain a biodiesel finished product. The method provided by the invention is reasonable in process, advanced in equipment, high in reaction speed, high in product conversion rate and low in production cost, and meets industrial production requirements. |
| WO2021105305 | Inachem GmbH et al. (DE) | **Method of making fatty acid esters.** Method of transesterifying a fatty acid triglyceride with a C1-30 aliphatic alcohol, the method comprising step (A): (A) heating the fatty acid triglyceride with the C1-30 aliphatic alcohol in the presence of an acid; wherein the acid is selected from the group consisting of a sulfonic acid, a disulfonic acid and a hydroxycarboxylic acid, and a mixture thereof; the molar ratio of fatty acid triglyceride to aliphatic alcohol is less than 1 : 6; and the heating in step (A) is in a temperature range of from 20 to less than 100 °C. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| CN112522034 | Inst Chemical Ind Forest Products CAF (CN) | **Method for preparing biofuel from rhodosporidium toruloides.** The invention discloses a method for preparing biofuel from rhodosporidium toruloides, which comprises the following steps: putting rhodosporidium toruloides and a solvent into a closed reaction kettle, heating the reaction kettle in an air-isolated atmosphere, reacting the yeast with the solvent in a high-temperature high-pressure environment, and destroying the cell walls, carrying out transesterification on grease in the cells and ethanol in the solvent, filtering out residues, and removing the solvent to obtain a mixture which takes long-chain fatty acid ethyl ester as a main component andis a biofuel. Compared with a traditional process, the method has the advantages that the biofuel is prepared by a thermochemical method, cell wall breaking and ester exchange are synchronously carried out, and the biofuel is prepared by a one-step method, so that the preparation process of the biofuel is simplified, the process time is shortened, the environmental pollution caused by waste liquid in the existing ester exchange reaction is eliminated, a catalyst is not needed, and the method is economic and environment-friendly; and the method is a novel environment-friendly process for preparing biofuel from rhodosporidium toruloides. |
| WO2021107260 | Moojin Machinetool Co Ltd (KR) | **Biodiesel production system comprising process for preprocessing high acid value oil using biodiesel by-product.** The present invention relates to a system for producing biodiesel after reducing the free fatty acid (FAA) content of oil and fat that contains a large amount (2.6 to 60%) of FAA (high acid value oil hereinafter), and more specifically, to a biodiesel production system comprising a process for preprocessing high acid value oil using a biodiesel by-product, the system comprising: a high acid value oil preprocessing reaction unit which, by mixing glycerin into high acid value oil, produces low acid value oil having a reduced FAA content (2.5% or less), and then discharges same; and a biodiesel synthesis reaction unit which comprises a low acid value reaction tank for mixing the low acid value oil, methanol and a catalyst, which have been injected therein, a precipitation tank for precipitating the glycerin and separating and discharging same, a methanol recovery tank for recovering the methanol, a washing tank for washing after the recovery of the methanol, a drying tank for removing water after the washing; and a biodiesel storage tank for storing biodiesel from which water has been removed in the drying tank. |
| WO2021058875 | Neste Oy (FI) | **Renewable base oil production engaging metathesis.** Herein is provided a process for producing renewable products, such as a renewable base oil, from a feedstock of biological origin. The process comprises subjecting a feedstock comprising free fatty acids and fatty acid glycerides, wherein at least one hydrocarbon chain is unsaturated, to esterification reaction in the presence of an alcohol. The ester stream thereby obtained is then subjected to metathesis conditions in the presence of a renewable alkene to obtain a metathesis product. Separation of said metathesis product comprises recovery of a fraction comprising or consisting essentially of C16 fatty acid esters, which is subjected to ketonisation reaction conditions to produce long chain ketones, which after hydrotreatment meet requirements for a renewable base oil. Ketonisation reaction produces renewable alkene usable in metathesis reaction. |
| WO2021074201 | Novozymes AS (DK) | **Fatty acid esterification process.** The present invention relates to a process for enzymatic esterification of free fatty acids. In particular the invention relates to this process using a flash operation for water removal from enzyme reaction mixture. |
| US2021095216 | Texon LP (US) | **Controlled blending of biodiesel into distillate streams.** Methods are provided for accurately blending biodiesel into distillate streams to achieve a pre-determined percentage of biodiesel in the distillate, applicable to wild-type distillate streams as well as distillate streams that already contain some percentage of biodiesel. |

| Bio-jet fuels | | |
|---|---|---|
| Nº Publicación | Solicitante (País) | Contenido técnico |
| CN112521975 | China Huanqiu Contracting & Eng Co Ltd (CN) | **Hot hydrogen stripping method for preparing aviation biofuel by two-stage hydrogenation method.** The invention discloses a hot hydrogen stripping method for preparing aviation biofuel by a two-stage hydrogenation method. According to the method, a hot hydrogen stripping tower is arranged betweentwo sections of reactors, high-separation hot hydrogen of a rear-section reactor is adopted as a gas source, hot hydrogen stripping operation is carried out at the outlet temperature and pressure of afront-section reactor, and components including hydrogen sulfide, carbon monoxide, carbon dioxide and water in a liquid-phase material are removed. The hot hydrogen stripping method disclosed by theinvention is applied to a process for preparing aviation biofuel by a hydrogenation method, impurity components in a deoxidation reaction product can be removed at low cost, and the requirement of a downstream cracking isomerization reaction catalyst on sulfur content limitation is met. |
| CN112538009 | China Petroleum & Chem Corp et al. (CN) | **Dimer acid as well as continuous production method, continuous production system and application thereof.** The invention provides a continuous production method and a continuous production system for dimer acid. The continuous production method comprises the step in which a mixed system containing C18 fatty acid and a solvent is subjected to a continuous polymerization reaction in a fixed bed reactor containing a catalyst to prepare the dimer acid, wherein the catalyst comprises a carrier and an activecomponent loaded on the carrier, the active component comprises aluminum, the carrier is an MCM-41 molecular sieve or an MCM-48 molecular sieve, and the silica-alumina ratio of the catalyst is (5-80): 1 by molar ratio. The dimer acid is prepared by adopting a specific catalyst and a specific method, so that the purity, the yield and the selectivity of the obtained dimer acid are obviously improved, meanwhile, the monocyclic proportion of the obtained dimer acid is high, and when the obtained dimer acid is used in an anti-wear agent, the anti-wear performance of the anti-wear agent can be improved. The method provided by the invention can also ensure continuous polymerization reaction, and is suitable for large-scale production of dimer acid. |
| WO2021092213 | Gevo Inc (US) | **Selective formation of jet and diesel fuels from bio-based C3-C8 olefins via oligomerization with tungstated catalysts.** Disclosed is a process for converting lower linear and branched mono-olefins, derived from C2-C5 bio-based alcohols to higher hydrocarbons, to one or more C8-C24 hydrocarbons. Certain embodiments provide a process for oligomerization of branched and/or linear C3-C8 olefins to renewable diesel fuel and/or jet fuel in overall yields of at least 70% in the presence of tungstated γ-alumina or tungstated silica catalysts admixed with ZSM-5 type zeolites. |
| CN112552949 | Guangzhou Inst Energy Conversion CAS (CN) | **Method for synthesizing high-density low-freezing-point hydrocarbon component from biomass platform compound.** The invention discloses a method for synthesizing a high-density low-freezing-point hydrocarbon component from a biomass platform compound. The method comprises the following steps: (1) carrying out aldol condensation reaction by taking ethanolamine ionic liquid as a catalyst and cyclopentanone and aromatic aldehyde as raw materials to prepare a reaction product, and separating the reaction product to obtain a bicyclic condensation product and a tricyclic condensation product; and (2) under the action of a water-resistant bifunctional catalyst, carrying out hydrodeoxygenation reaction on the bicyclic condensation product and the tricyclic condensation product obtained in the step (1) to obtain the high-density low-freezing-point hydrocarbon component. The product obtained by the method provided by the invention can be used as a high-performance jet fuel, the energy density of the fuel is improved, and the low-temperature flowing property is improved. |
| KR20210027985 | Korea Res Inst Chemical Tech (KR) | **Catalyst for the synthesis of jet fuel range hydrocarbon through one-pot hydrotreatment reaction manufacturing method thereof.** ZSM-5 zeolite carrier; and a catalytically active metal including nickel (Ni) or cobalt (Co) and molybdenum (Mo) impregnated in the carrier; and a one-pot hydrogenation reaction using a paraffinic hydrocarbon compound separated from biodiesel as a reaction raw material. In the production of a hydrocarbon mixture in the range of jet fuel by the one-pot hydrogenation reaction, the isomerization rate of jet fuel is 70% or more, and the yield of jet fuel is 40% or more, paraffinic hydrocarbon compound separated from biodiesel as a reaction raw material. A catalyst for the production of hydrocarbon mixtures in the jet fraction range is disclosed. |
| WO2021099343 | Neste Oyj (FI) | **A hydrocarbon composition.** Disclosed is a hydrocarbon composition comprising isomerised paraffins having specific cut-off points in the distillation curve, a density from 768.0 to 772.0 and an average carbon number of 14.3 to 15.1. The hydrocarbon composition is useful as fuel or fuel component, especially a jet fuel. Disclosed is also a method to produce a hydrocarbon composition. The isomerised paraffins in the hydrocarbon composition can be from a renewable source. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| WO2021094657 | Neste Oyj (FI) | **Method for producing renewable fuel and base oil.** The present invention provides a base oil produced from feedstock of biological origin and a method for producing the same. The present invention further provides base oil blends comprising the base oil of biological origin and at least one additional base oil. |
| WO2021094655 | Neste Oyj (FI) | **Method for producing renewable fuels.** The present invention provides a diesel fuel component produced from feedstock of biological origin and a method for producing the same. The present invention further provides diesel fuel blends comprising the diesel fuel component of biological origin and at least one additional diesel fuel. |
| WO2021105557 | Neste Oyj (FI) | **Method to prepare an aviation fuel component.** The present invention relates to methods for preparing aviation fuel component (80) from a feedstock (10) comprising fossil hydrotreating feed and a second feed comprising esters of fatty acids and rosins, free fatty acids and resin acids. The method comprises subjecting the feedstock to hydrotreatment reaction conditions to produce a hydrotreated stream (20), separating the hydrotreated stream to three fractions (30, 40, 50) from which at least part the highest boiling fraction (50) is subjected to hydrocracking reaction to produce a hydrocracked stream (60). At least part of the hydrocracked stream is admixed with at least part of the hydrotreated stream, and their admixture (70) is processed further until desired conversion of the feedstock to the aviation fuel component is obtained. |

## Biohidrógeno

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| CN112520691 | Dongguan Baida New Energy Co Ltd (CN) | **Biomass hydrogen production equipment.** The invention discloses biomass hydrogen production equipment. The equipment comprises: a feeder, wherein a spiral cutter is arranged in the feeder, a coupler fixedly connected with the spiral cutteris arranged on one side of the feeder, a first discharging port is formed in the other side of the feeder, a first motor is arranged on one side of the coupler, and a first feeding port is formed in the upper end of the feeder; and a reactor, wherein a water tank is arranged on the outer side of the reactor, two liquid passing openings are formed in the outer side of the water tank, a second feeding opening, a third motor, a detection probe and an air outlet are formed in the upper portion of the water tank, and an aeration device is arranged at the lower end of the reactor. Through the arrangement of a cutting knife and an auxiliary structure matched with the cutting knife, introduced materials can be treated in advance, the fed materials are cut, and the situation that subsequent materials are blocked is effectively avoided. |
| CN112520694 | Dongguan Baida New Energy Co Ltd (CN) | **Biomass gas purification treatment process.** The invention discloses a biomass gas purification treatment process. The process comprises the following steps: S1, biomass pretreatment; S2, biomass retreatment; S3, biomass purification treatment;and S4, biomass hydrogen production treatment. By utilizing biomass gasification, gas supply, heat supply, biomass hydrogen production and integrated power supply with a fuel cell are achieved, a distributed gas-heat-electricity co-generation system can be realized, and the system is an important composition for clean energy supply in the future. Meanwhile, the process can realize regional gas supply and heat supply, and achieves the purposes of reducing energy consumption, energy cost, pollutant discharge and CO2 discharge of enterprises and alleviating regional energy supply and demand contradiction. A tar catalytic conversion catalyst is developed, so that the tar content of the biomass gas is reduced, macromolecular hydrocarbon in tar is converted into useful gas such as micromolecularhydrocarbon, the generation of tar is reduced from the source, the gasification efficiency and the heat value of a gasification product are improved, and a great purification effect is achieved. |
| CN112520696 | Dongguan Baida New Energy Co Ltd (CN) | **Separation and purification device for biomass hydrogen production.** The invention discloses a separation and purification device for biomass hydrogen production. The device comprises a gasification system, the gasification system is communicated with the gas outlet end of the biomass hydrogen production system, the gas outlet end of the gasification system sequentially passes through a filtering system, a decoking system and a purification system and is communicated with a gas collection system, and the gas collection system is communicated with the gas supply end of a gas supply pipeline. According to the invention, purification is carried out after dust removal and decoking are carried out on the gas, and in addition, a reverse purging device can continuously purify the hydrogen, so that other gases in the gas are gradually discharged from an emptying pipeline, and the internal hydrogen quality of the gas collection system is gradually improved. In addition, in order to realize continuous production and purification of the hydrogen, a plurality of groups of reverse purging devices can also be arranged, so that uninterrupted production is realized, and the hydrogen production efficiency is improved. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| GR20190100424 | Eidikos Logariasmos Panepistimiou Kritis Elpk et al (GR) | **Production of bio-hydrogen (H2) by exposure to plant (micro)organisms and other non-photosynthetic microorganisms in an electric field.** The present invention relates to the production of bio-hydrogen (H2) by plant (micro) organisms but also by other non-photosynthetic microorganisms as result of their metabolic processes when exposed to an electric field of appropriate voltage and intensity. With the present invention, we "exploit" an electrolysis environment (an electric field between two platinum electrodes in water) to expose unicellular green algae (or other photosynthetic or non-photosynthetic microorganisms). Under these conditions, within a few minutes we see an increase in the metabolic processes of the microorganisms with a parallel high rate of bio-hydrogen production (40-100% of the corresponding electrolytic hydrogen produced). The rate of bio-hydrogen production is independent of the rate of hydrogen production through electrolysis, which remains constant. The rate of bio-hydrogen production from green algae in an electric field is about 2500 times higher than the corresponding rate of bio-hydrogen production from green algae under anoxic conditions without the effect of electric field. |
| KR20210023548 | Korea Inst Sci & Tech (KR) | **A catalyst for liquid phase reforming of biomass the method for producing the same and the method for producing high purity hydrogen.** The present specification discloses a heterogeneous alloy catalyst for liquid phase reforming of biomass, a method for preparing the same, and a method for producing hydrogen using a liquid phase reforming reaction of a saccharide or a compound derived therefrom using the same. |
| KR20210033251 | Korea Inst Sci & Tech (KR) | **Process for producing hydrogen from biomass at low temperature and low pressure.** The present invention relates to a method of producing hydrogen from biomass at low temperature and low pressure, and more particularly, a liquid product containing mainly formic acid through a low temperature hydrothermal treatment of a mixed aqueous solution of biomass, an acid, an oxidizing agent, and a polar aprotic solvent. After obtaining the hydrogen gas mixture and recovering the hydrogen gas mixture, a distillation or separation membrane from the remaining liquid product was obtained to obtain an aqueous formic acid solution that minimized the concentration of impurities, and then a dehydrogenation catalyst was added to the aqueous formic acid solution. It relates to a low-temperature low-pressure process for producing a gas mixture. |
| WO2021062218 | Purdue Research Foundation (US) | **Processes and systems for biological hydrogen production from organic waste using yeast.** Processes and systems for biologically producing hydrogen gas from organic waste, including food waste. Such a process includes biologically producing hydrogen gas from organic waste by anaerobic fermentation of the organic waste with at least one strain of yeast. |
| CN112588243 | Univ Hebei North (CN) | **Biomass hydrogen production composite catalyst synthesis device and synthesis method.** The invention discloses a biomass hydrogen production composite catalyst synthesis device which comprises a shell, a cover plate is movably connected to the top of the shell, the surface of the shellis fixedly sleeved with a cover body, a heating wire is fixedly connected to the right side of an inner cavity of the cover body, and a semiconductor chilling plate is fixedly connected to the left side of the inner cavity of the cover body; and the inner wall of the cover body is movably sleeved with a gear ring, stirring rods are fixedly connected to the tops of the two sides of the gear ring, and a first motor is fixedly connected to the right side of the bottom of the cover body. The biomass hydrogen production composite catalyst synthesis device solves the problems that an existing biomass hydrogen production composite catalyst synthesis device is poor in stirring effect, insufficient in mixing and uniform in stirring, large in difference between upper and lower raw materials and relatively insufficient and slow in reaction process, most of the raw materials are heated through internal resistance wires during synthesis, although heating is rapid, heating is not uniform, the reaction is insufficient, the cleaning is inconvenient, and the next use is influenced. |
| CN112473680 | Univ Huazhong Science Tech (CN) | **Bifunctional calcium-based catalyst and preparation method and application thereof.** The invention discloses a difunctional calcium-based catalyst and a preparation method and application thereof. The preparation method comprises the two processes of preparation of a mayenite carrierand preparation of the difunctional calcium-based catalyst, the mayenite carrier is prepared through a calcination-hydration method, and the difunctional calcium-based catalyst is prepared through a hydrothermal method. In reforming hydrogen production reactions of first-stage, second-stage and third-stage tar simulants, the prepared difunctional calcium-based catalyst shows good catalytic activity and high CO2 adsorption performance, high activity is still kept after circulation for four times, and the whole preparation method is simple and high in operability, and the difunctional calcium-based catalyst has a good application prospect in biomass tar reforming hydrogen production and utilization. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| WO2021113588 | Univ South Carolina (US) | **Steel mesh based catalyst with superior mechanical stability / magnetic separability.** Described herein are reusable, mesh-based catalysts with superior mechanical stability and magnetic separability wherein the mesh may be formed in a variety of shapes and can be easily separated from a process stream and in combination with biomass torrefaction, reduces toxic emissions and produce hydrogen gas, which can be burned at the facility to generate heat or electricity. |

## Otros biocombustibles (hidrobiodiésel, biopropano, biocrudos, etc.)

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| WO2021087618 | Expander Energy Inc (CA) | **Process for producing synthetic hydrocarbons from biomass.** A process for preparing synthetic hydrocarbons from a biomass feedstock is provided. The process involves electrolyzing water in an electrolyzer to produce oxygen and hydrogen, using the generated oxygen to gasify a biomass feedstock under partial oxidation reaction conditions to generate a hydrogen lean syngas, adding at least a portion of the generated hydrogen to the hydrogen lean syngas to formulate hydrogen rich syngas, which is reacted a Fischer Tropsch (FT) reactor to produce the synthetic hydrocarbons and water. At least a portion of the water produced in the FT reaction is recycled for use in the electrolysis step, and optionally using heat generated from the FT reaction to dry the biomass feedstock. |
| WO2021087616 | Forge Hydrocarbons Corp (CA) | **Processes for producing hydrocarbon material from organic feedstock.** There is provided a process for producing hydrocarbon material from a hydrocarbon material precursor which includes free fatty acid material, comprising: supplying a hydrocarbon material precursor-comprising feed material to a conversion zone, with effect that the hydrocarbon material precursor-comprising feed material is converted to a gaseous hydrocarbon material-comprising product; condensing a portion of the gaseous hydrocarbon material-comprising product such that a condensed hydrocarbon material-comprising product is obtained; and recycling the condensed hydrocarbon material-comprising product to the conversion zone as a reflux; wherein the condensing is effected in response to emplacement of the gaseous hydrocarbon material-comprising product in heat transfer communication with a heat sink disposed externally of the conversion zone. |
| WO2021099220 | Neste Oyj (FI) | **Gasoline composition with octane synergy.** The present invention relates to the field of gasoline and gasoline compositions or blends. More specifically the invention relates to a novel fuel or gasoline composition with synergistic effects and use thereof, and in particular a synergistic effect with respect to the octane rating/octane number. |
| US2021087480 | Reg Synthetic Fuels LLC (US) | **Renewable hydrocarbon lighter fluid.** The present technology relates to hydrocarbon fluids, and more particularly, a hydrocarbon lighter fluid derived from renewable sources. Specifically, the present invention relates to converting fatty acids/glycerides to a charcoal lighter fluid with the same or better performance as petroleum middle distillates. |
| CN112521990 | Sichuan Jinshang Environmental Protection Tech Co Ltd (CN) | **Method for producing high-flash-point pure oil fuel by modifying methanol with waste cooking oil.** The invention discloses a method for producing high-flash-point pure oil fuel by modifying methanol with waste cooking oil, and solves the technical problem of high production cost of methanol fuel inthe prior art. The method comprises the following steps: step 1, mixing methanol with N-hexyl amide for reaction to generate a methanol mixed solution, and processing waste cooking oil into fatty acid; step 2, mixing the methanol mixed solution prepared in the step 1 with fatty acid for reaction to generate a fatty acid-modified methanol solution; and step 3, adding kerosene capable of forming asuspension system into the fatty acid-modified methanol solution, performing stirring to form a microemulsion suspension, dropwise adding dodecanol to adjust until the liquid is transparent, performing standing for 24 hours, performing stirring again, and performing uniform discharging to obtain the high-flash-point pure oil fuel. According to the production method of the high-flash-point pure oilfuel, the production cost of the methanol fuel can be effectively reduced, the pure oil fuel with a flash point exceeding 60 DEG C can be prepared, and production and transportation of the pure oil fuel are safe and environmentally friendly. |
| EP3798286 | Vertoro BV (NL) | **A method for obtaining a lignin oil composition using a compressed gas and acid assisted process.** The present invention relates to a process for the production of a liquid lignin composition, in particular to a method for obtaining a lignin composition using a compressed gas and acid assisted process, wherein a lignocellulosic biomass feedstock is treated with a polar organic solvent using an inorganic acid to assist in the release of lignin into the polar organic solvent and the use of compressed gas to keep the polar organic solvent in its liquid phase. |

# PATENTES BIOPRODUCTOS

| Biomateriales (de construcción, medicina, embalaje, etc.) | | |
|---|---|---|
| **Biocomposites y biofibras** | | |
| Nº Publicación | Solicitante (País) | Contenido técnico |
| WO2021066775 | Atatuerk Ueniversitesi Bilimsel Arastirma Projeleri Birimi (TR) | **A chemical method for thinning wool fibres.** Invention relates to a chemical method providing thinning of wool fibres comprising process steps of wetting wool fibres with water, adding chemical abrasive solution onto wetted wool, mixing wools until desired thinning and lighting is achieved, filtering and separation of wool, washing separated wool with water and drying. |
| WO2021095297 | Bioapatite Inc et al. (JP) | **Cured article and method for manufacturing same.** A novel cured article with which it is possible to expand usage of rubble, etc., and expand usage of plant biomass. The present invention contains an inorganic material and at least one material selected from lignin and cellulose. |
| WO2021096461 | Duzce Univ Rektorlugu (TR) | **Composite panel with rice husk additive and polyurethane filling.** The invention relates to, composite panels with rice husks or rice husk powder or rice husk and rice husk powder mixture additive and polyurethane filling, that aesthetically solves the problem of the outer shell of structures such as heat, water and sound insulation, and that is used in large-sized buildings the carrier system of which is steel or prefabricated, such as factories, industrial buildings, military buildings, social buildings, agricultural buildings, sports facilities, construction site buildings, silos, hypermarkets, shopping malls, cold stores, wholesale market buildings, in the production of facades, roofs, cold storage, louver-shutters, refrigerators, in white goods industry, space and aviation industries. |
| EP3805318 | Evertree (FR) | **Process for the manufacture of a lignocellulosic fibre-based composite material and composite material obtained by such process.** The present invention relates to a process for the manufacture of a lignocellulosic fibre-based composite material comprising the steps of:• obtaining a fibrous mix (S1) comprising a defibrated lignocellulosic material and defibrated plant seeds;• blending the fibrous mix with a resin (S2) to form a composite mixture; and• curing (S3) the composite mixture, thereby forming the lignocellulosic fibre-based composite material.In this process, defibrated plant seeds are used as source of protein and fibres, provided in a dry fibrous mix of defibrated lignocellulosic material and defibrated plant seed.A preferred application of this process is the manufacture of fibreboards, such as MDF. |
| WO2021090052 | GP Agtech SA (AR) | **Lignocellulosic composite formed by a first source from maize plant waste with cellulose fibres from a second source and production method.** The invention relates to a lignocellulosic composite formed by mixtures of fibres from a first source of maize waste fibre, and to a production method, which consists of at least part of the stalk and leaves (husk) in a proportion by weight of 65-90% of the total weight of fibre, mixed with 35-10% of the total weight of a second source of fibres from the waste of an annual plant species, with a width, lumen and thickness less than those of the fibre from the first source. The first fibre source has a high cationic charge, the fibres and fines produced being contained in a mechanical maize paste with fibres having greater tensile strength, which come from the second fibre source, forming self-linkages, establishing hydrogen-bridge bonds. |
| EP3819118 | Munksjoe ahlstrom OYJ (FI) | **Compostable lid for sealing a beverage capsule or a beverage pad and capsules and pads sealed therewith.** This invention relates a compostable lid for sealing a beverage capsule or a beverage pad wherein the lid comprises a natural-fiber based support obtainable by:(i) providing a first fibrous base sheet comprising natural fiber material sensitive to a gelatinizing agent;(ii) treating the first base sheet with a gelatinizing agent to give a treated first fibrous base sheet comprising gelatinized material;(iii) providing a second fibrous base sheet;(iv) contacting the treated first fibrous base sheet and the second base sheet with each other;(v) causing at least partial migration of the gelatinized material from the treated first fibrous base sheet into the second fibrous base sheet to give a multilayer product; and(vi) neutralizing and/or washing the product thus obtained and then drying it. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| WO2021080491 | Rise Innventia AB (SE) | **Lignin-containing sealant and/or coating compositions from renewable sources.** The present invention relates to lignin-containing compositions comprising: 10 to 50 percent by weight of lignin; 10 to 50 percent by weight of a polyethylene glycol; 10 to 50 percent by weight of an acrylic resin; and 1 to 50 percent by weight of an inorganic filler; wherein the percentages by weight are expressed relative to the total dry weight of the composition, and wherein the total dry weight of the composition amounts to 100 percent. The present invention further relates to processes for sealing joints or coating surfaces using such a composition. Moreover, the present invention relates to joints sealed and surfaces coated using such a composition, as well as vehicles comprising such sealed joints and coated surfaces. |
| EP3831564 | Saint Gobain Isover (FR) | **Method for manufacturing lignocellulose fibre panels.** The invention relates to a method of manufacturing insulation boards based on lignocellulosic fibers, comprising (a) providing lignocellulosic fibers, (b) applying to the lignocellulosic fibers a binder composition, (c ) The formation of a mat of lignocellulosic fibers by compression of the lignocellulosic fibers impregnated with the binder composition, (d) Heating the mat of lignocellulosic fibers compressed so as to obtain a panel of lignocellulosic fibers bound by an insoluble and infusible thermoset binder , said process being characterized in that the binder composition is an emulsion of a poly (methylene diphenyl isocyanate) (pMDI) in an aqueous phase comprising water and a polyol in the dissolved state. |
| EP3828226 | Sika Tech AG (CH) | **An acoustic damping material comprising renewable raw materials.** The invention is directed to an acoustic damping material comprising a binder matrix comprising a bitumen component or a polymer component, and filler component comprising at least one solid particulate cellulose-containing filler. The acoustic damping material is suitable for use in damping of undesired vibrations and noise in mechanical structures and components of manufactured articles. The invention is also directed to use of the acoustic damping material for damping of vibrations and noise in transportation vehicles and white goods, to a vibration and noise damping element comprising a damping layer composed of the acoustic damping material, to a method for applying a vibration and noise damping element to a noise emitting surface of a substrate, and to a vibration damped system comprising a substrate and the vibration and noise damping element bonded to a noise emitting surface of the substrate. |
| WO2021086974 | Struktol company of america LLC (US) | **Wood polymer composites and additive systems therefor.** A wood polymer composite additive includes at least one maleic anhydride grafted polymer coupling agent, a second coupling agent that is at least one of a silane and siloxane, at least one peroxide crosslinking agent; and an amine compound. A wood polymer composite includes the additive, a thermoplastic polymer and cellulosic material. A wood polymer composite article is formed by extruding the composite material. |
| WO2021072257 | US Agriculture (US) | **Thermochemical biomass compounder.** A system, optionally a continuous-process system, for the production of a biomass-polymer composite. The system accepts a biomass input, particulates the biomass using one or more mills, subjects the particulated biomass to a heat treatment, such as torrefaction, and then compounds the torrefied biomass with a polymer to create the composite. Such a system, and in particular, a continuous-type system, allows for efficient processing of all of the inputs, and furthermore eliminates the dangers, time, and costs associated with having to safely cool down torrefied biomass prior to compounding at a later time or location. |
| WO2021076047 | Vaelinge Innovation AB (SE) | **Wood fibre based panel and a method for obtaining such panel.** A building panel having a thickness (D) after pressing and comprising a substrate, a first sub-layer comprising a binder arranged on a first side of the substrate and a surface layer comprising a first wood veneer, arranged on the first sub-layer, wherein the building panel has a thickness distribution of about ±7,5 %, the thickness distribution defined by the formula:((D max –D min)/(Dmax+Dmin)) x 100 and a method for producing a building panel. |

| Bioplásticos | | |
|---|---|---|
| Nº Publicación | Solicitante (País) | Contenido técnico |
| EP3828229 | Arcelik AS (TR) | **A biopolymer compound and a refrigerator comprising an egg tray produced from biopolymer.** The present invention relates to a biopolymer compound comprising polylactic acid or polylactic acid based biopolymer and eggshell powder, and to a refrigerator comprising an egg tray produced from said compound. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| EP3797948 | Bic Violex SA (GR) et al. | **Handle for razor made of bioplastic polymers and vegetable fillers.** The present disclosure provides a handle for razor made of polylactic acid (PLA) with another bioplastic polymer such as polybutylene succinate (PBAT), bio-polyethylene (bio-PE), and polybutylene succinate (PBS), combined with vegetable fillers chosen in the group consisting of wood, wheat, flax, and seagrass. The present disclosure also provides a method for manufacturing such handle, a razor including such handle, and a skincare kit including such handle. |
| WO2021110337 | Conopco Inc D/B/A Unilever [US] et al. | **Biodegradable package containing water-soluble capsules.** A substrate treatment product comprising a package comprising at least one layer of fibrous or pulp material and at least one layer of a polymeric material selected from polylactic acid, polyhydroxyalkanoate, a polyester, polybutylenadipate terephthalate, a cellulose based material, a starch based material, a sugare cane based material and mixtures thereof, and the packaging containing a plurality of water-soluble capsules, each water-soluble capsule comprising a substrate treatment composition within a sealed compartment which is filled to at least 60% of the volume of the compartment, the package comprising (i) a receptable containing or more of said water soluble capsules and a closure; (ii) a child resistent closure mechanism comprising a first locking member on the receptacle and a second locking member present on the closure whereby the members interlock; wherein the substrate treatment composition has a viscosity in the range 200 mPa.s – 2000 mPa.s at 25°C at a shear rate of 21 sec-1, wherein the water soluble capsule comprises a water soluble film comprising polyvinyl alcohol, a modified polyvinyl alcohol, polyvinyl acetate, carboxymethylcellulose or hydroxypropyl methyl cellulose and wherein the water content of the substrate treatment composition is in the range 0.01 – 15%wt. based on the total weight of the composition. |
| EP3819380 | Consejo Superior Investigacion (ES) | **Recombinant pseudomonas putida strains for the production of polyhydroxyalkanoate.** The invention relates to recombinant Pseudomonas putida strains derived from P. putida KT2440 which harbor genetic modifications that make them able to produce significant amounts of polyhydroxyalkanoate (PHA) under balanced nutritional conditions, even by using fatty acid-unrelated carbon sources. Genetic modifications comprised in these recombinant strains focus on avoiding nitrogen limitation and overproducing PHA. The invention also refers to a method for the production of PHA in which the strains of the invention are used. |
| ES2812048 | Fundacion Univ Catolica de Valencia San Vicente Martir et al. (ES) | **Biodegradable biomaterial.** The present invention relates to a hydrophilic biodegradable biomaterial comprising a semi-interpenetrated network (semi-IPN) made up of a polymer of the polyhydroxyalkanoate (PHA) family, and another polyvinyl alcohol (PVA) polymer. Likewise, the invention refers to its method of obtaining and to a composition comprising said material and particles with conductive and antimicrobial properties useful for the prevention and treatment of microbial and microbial infections and in tissue regeneration through the use of cell substrates based on the biomaterial. with and without electrostimulation. |
| WO2021085120 | Kaneka Corp (JP) | **Method for producing poly(hydroxyalkanoic acid) and use of said poly(hydroxyalkanoic acid).** A purpose of the present invention is to provide a production method by which a poly(hydroxyalkanoic acid) (PHA) (e.g., a PHA powder) can be obtained at high efficiency. This PHA production method comprises (a) the step of producing an aqueous suspension containing a PHA and a dispersant and having a pH of 7 or less and (b) the step of spray-drying the aqueous suspension produced in the step (a), wherein the dispersant is composed of a poly(ethylene oxide) (PEO) block and a hydrophobic group, the PEO block in the dispersant being made up of 20 or more repeating ethylene oxide (EO) units. |
| WO2021054721 | LG Chemical Ltd (KR) | **Biopolymer composition, preparation method for same and bioplastic using same.** The present application relates to a biopolymer composition, a preparation method for same and a bioplastic using same, the biopolymer composition comprising at least 83.5 weight% of a copolymer resin of lactic acid (LA) and 3-hydroxypropionate (3HP), an antioxidant, and a lubricant, and the composition having an elongation percentage of at least 90% but not greater than 500%. |
| WO2021086927 | Mars Inc et al. (US) | **Medium-chain-length polyhydroxyalkanoates and their use in chewing gum bases.** The present disclosure is directed to medium chain length polyhydroxyalkanoate (mcl-PHA) copolymers, and to chewing gum bases and chewing gums comprising the mcl-PHA copolymers. In some instances, the mcl-PHA copolymers may partially or completely replace conventional petroleum-based gum base polymers, including elastomers, in the chewing gum and gum base. The chewing gums and gum bases of the present disclosure may be free or substantially free of petroleum-based ingredients. Chewing gums comprising the mcl-PHA copolymers of the present disclosure may also have enhanced degradability as compared to conventional chewing gums. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| WO202111926 | Ticona LLC et al. (US) | **Cellulose ester composition containing bloom resistant or bio-based plasticizer.** A polymer composition containing cellulose acetate in combination with one or more bloom resistant or bio-based plasticizers and optionally one or more bio-based polymers is described. The polymer composition is formulated so as to have properties similar to petroleum-based polymers for producing, for example, single-use biodegradable articles. |
| WO2021094525 | Total Corbion Pla BV (NL) | **Process for polymerising lactide using a liquid catalyst formulation.** The present invention relates to a process for polymerizing lactide comprising the steps of a) preparing a liquid catalyst formulation comprising a catalyst, an initiator and lactide, and b) contacting the liquid catalyst formulation prepared in step a) with lactide, and polymerizing said lactide in the presence of said liquid catalyst formulation to form polylactide. The invention further provides a liquid catalyst formulation and use thereof for polymerizing lactide. |

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

### Biofertilizantes, bioadhesivos, etc.

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| ES2827874 | Aguasol rizo SL (ES) | **Machine and manufacturing processes for biological inputs based on compost tea and its derivatives with simplified biodynamic technology.** Machine and manufacturing process of biofertilizers based on compost tea and its derivatives. This invention is both the machine and the process of using it for the manufacture of biofertilizers based on compost tea and its derivatives using simplified biodynamic technology and the precepts for structuring water. There are many advantages that incorporate the use of this machine and the application of these biofertilizers on agricultural soil. The increase in organic matter, the improvement of the crops and their organolepic properties, the elimination of toxins, the multiplication of microorganisms in the soil or the improvement of quality and the increase in production are just some of its advantages. |
| WO2021117519 | Bridgestone Corp (JP) | **Adhesive composition.** The present invention pertains to: an adhesive composition for organic fiber cord, that has little environmental load as a result of not containing resorcin or formalin and has good adhesiveness; a production method for the adhesive composition for organic fiber cord; and a rubber reinforcing member (organic fiber cord–rubber complex) and tire using these. In addition, the adhesive composition for organic fiber cord is characterized by including a first bath treatment fluid and a second bath treatment fluid. The first bath treatment fluid is a composition including an epoxide and an isocyanate compound. The second bath treatment fluid is a composition including a polyphenol compound (excluding resorcin) and an aldehyde compound having an aromatic ring. |
| WO2021078836 | Centre Nat Rech Scient et al. (FR) | **Biobased adhesive compositons.** The present invention relates to biobased adhesive compositions. More particularly, the present invention relates to adhesive compositions, the processes for manufacturing same and the applications thereof, in particular in the form of wood particle board. The invention relates in particular to an adhesive composition in the form of a solution or dispersion comprising at least one water-soluble or water-dispersible polysaccharide comprising aldehyde functions, said solution or dispersion having a solids content of greater the 20 wt%, preferably of at least 30 wt% and more preferably of at least 40 wt%, expressed as a weight percentage of solids relative to the total weight of the solution or dispersion. |
| WO2021117826 | Dainippon Ink & Chemicals (JP) | **Adhesive tape.** Provided is an adhesive tape that has a high degree of biomass, sufficient adhesive strength and excellent re-peeling. This adhesive tape is characterized by having an adhesive agent layer that contains a polyester resin, a degree of biomass of 80 wt% or greater, a gel percentage of 40 wt% or greater, and an adhesive strength to a stainless steel sheet of 4 to 14 N/20 mm. |
| WO2021054215 | Denka Company Ltd (JP) | Emulsion-type adhesive and adhesive tape. To provide: an emulsion-type adhesive from which an adhesive tape having excellent adhesive force and adhesion holding force, and also having less adhesive residue can be formed; and an adhesive tape using the emulsion-type adhesive. [Solution] This emulsion-type adhesive contains, with respect to 100 parts by mass of a rubber component in terms of solid content, 50-220 parts by mass of a tackifying resin in terms of solid content, and 5-30 parts by mass of polyvinyl alcohol in terms of solid content. The rubber component is preferably a rubber mixture containing a natural rubber and a synthetic rubber at a mass ratio of 80:20 to 20:80 in terms of solid content. The synthetic rubber preferably contains a methyl methacrylate graft rubber. It is preferable that the polyvinyl alcohol has a polymerization degree of 550-5000 and a saponification degree of 80-95 mol%. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| WO2021073765 | Hexion Inc (US) et al. | **Glycidyl esters of alpha, alpha branched acids from renewable sources and formulations thereof.** The invention relates to compositions of α,α-branched alkane carboxylic acids glycidyl esters which derived from rosin and or hydrogenated rosin reacted with an epihalohydrin. The above glycidyl esters compositions can be used for example, as monomer in binder compositions for paints or adhesives, as reactive diluent or as acid scavenger. This invention is also about the uses of rosin and or hydrogenated rosin glycidyl ester in combinations with polyester polyols, or acrylic polyols, or polyether polyols. |
| WO2021081018 | Massachusetts Inst Technology (US) | **Biomaterial-based compositions to deliver plant growth promoting microbes.** The use of biological fertilizer combined with microbes can be used instead of herbicides, pesticides and synthetic fertilizers. Silk and trehalose dry films can be used as seed coatings to localize and quantify delivery of plant microbes to mitigate plant stress and soil salinity. Similar microbes can be delivered using the same technology. |
| WO2021065836 | Nitto Denko Corp (JP) | **String-like adhesive body.** The present invention relates to a string-like adhesive body comprising a string-like core member and an adhesive layer that covers the surface of the core member in the longitudinal direction, wherein: the adhesive layer includes a non-biomass-derived component and the core member includes a biomass-derived component; and when 2 μl of water is dripped onto the core member and the contact angle of the water is measured, the difference between the contact angle θ0 measured immediately after water dripping and the contact angle θ30 measured when 30 seconds have passed since the water dripping (θ0 - θ30) is 20° or less. |
| WO2021070096 | Plantic Tech Ltd (AU) | **Laminate.** A laminate according to the present invention comprises a remoistening adhesive agent layer (I) and a base material layer (II), the remoistening adhesive agent layer (I) containing a modified starch (A) and a water-soluble polymer (B), and the modified starch (A) having an amylose content of at least 45 mass%. |
| WO2021065854 | Spiber Inc (JP) | **Adhesive.** To provide a novel adhesive that contains a protein as a starting material and that has sufficient adhesive strength. [Solution] An adhesive that contains spider silk fibroin and an alcohol. |
| WO2021101983 | Univ California (US) | **Tough tissue sealants and the use thereof.** The invention provides injectable, tough hydrogels that can be crosslinked in situ on demand using minimally-invasive methods, such as visible light exposure is an unmet medical challenge. Among the emerging biopolymers for tissue sealing, gelatin methacryloyl (GelMA), a naturally-derived biopolymer obtained from denatured collagen, has secured a promising role as a result of its excellent bioadhesion, biodegradation, and biocompatibility. To overcome one of the main shortcomings of GelMA, i.e., brittleness, we hybridized it using methacrylate-modified alginate (AlgMA) to impart ion-induced reversible crosslinking that can dissipate energy under strain. The hybrid GelMA-AlgMA hydrogels provide a photocrosslinkable, injectable, and adhesive platform with an excellent toughness that can be engineered using divalent cations, such as calcium. This class of novel hybrid biopolymers with more than 600% improved toughness may set the stage for durable, mechanically-resilient, and cost-effective tissue sealants in minimally invasive procedure, especially for stretchable tissues. |

| Biocosméticos, Biofarmaceúticos | | |
|---|---|---|
| Nº Publicación | Solicitante (País) | Contenido técnico |
| WO2021092667 | Bioart Biocosmeticos Ltda et al. (BR) | **Photoprotective compositions, photoprotective formulations including photoprotective compositions, preparation methods and uses thereof.** The present invention relates to compositions based on clays, oils and/or plant extracts with photoprotective and/or antioxidant activity and inorganic sunscreens, formulations including photoprotective compositions, preparation methods thereof and uses thereof. Problem to be solved: providing hybrid compositions of organic and inorganic photoprotective ingredients that do not require the use of nanoparticulate sunscreens or synthetic chemicals, that provide adjustable degrees of SPF and UVAPF and that make it possible to obtain photoprotective formulations in different pharmaceutical or cosmetic forms. Solution to the problem: Photoprotective compositions are disclosed that contain at least one clay, at least one oil and/or plant extract with photoprotective and/or antioxidant activity, and at least one inorganic sunscreen; said clay is present in the composition in a concentration of 0.1 to 85% by weight; said oil and/or plant extract is present in the composition in a concentration of 0.2 to 80% by weight; and said inorganic sunscreen is present in the composition in a concentration of 0.5 to 75% by weight. A photoprotective formulation including said photoprotective composition is also disclosed, together with the preparation method thereof. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| WO2021086042 | Daebong Ls Co Ltd et al. (KR) | **Cosmetic composition comprising red ginseng marc-derived oligosaccharide, and method for producing same.** The present invention relates to a cosmetic composition comprising a red ginseng marc-derived oligosaccharide, and a method for producing the red ginseng marc-derived oligosaccharide. The present invention uses an enzymatic bioconversion technology on red ginseng marc, which has low industrial use, so as to optimize a process for converting a high molecular weight polysaccharide into a low molecular weight oligosaccharide, and thus economic efficiency may be obtained. In addition, when applied on skin, the red ginseng marc oligosaccharide produced by the present invention affects the proliferation of a strain by acting as a skin flora food source and metabolic regulation influencing factor, and especially, has an effect whereby the growth of beneficial bacteria in skin flora may be promoted, while the growth of harmful bacteria in skin flora may be inhibited. |
| WO2021080297 | Doctor Tj Co Ltd (KR) | **Composition containing evening primrose flower extract as active ingredient for preventing or treating obesity or metabolic syndromes induced thereby.** The present invention relates to a pharmaceutical composition containing evening primrose flower extract as an active ingredient for preventing or treating obesity or metabolic syndromes induced thereby. Specifically, the evening primrose flower extract has been proven to have anti-adipogenetic activity and thus can be effectively used in preventing, ameliorating, and treating obesity or obesity-induced metabolic syndromes caused by adipogenesis. |
| WO2021081619 | EC Labs Inc (CA) | **Hemp peptide compositions for nutraceutical and personal care products.** A skin and/or hair care composition includes a mixture of low-molecular weight hemp (LMWH) peptides, some or all of the peptides are less than about 1 kDa in size. The composition may be a nutraceutical, food product, beverage or topical formulation. The peptides may be obtained by enzymatic hydrolysis of hemp proteins. The composition may be used to repair, mitigate or improve skin or hair health or conditions. |
| WO2021091080 | Gustar Co Ltd (KR) | **Composition for preventing or treating hair loss, or promoting hair growth or hair thickening, comprising complex extract of beet, red onion and purple-fleshed sweet potato as active ingredient.** The present invention relates to a composition for preventing or treating hair loss, or promoting hair growth or hair thickening, comprising a complex extract of beet, red onion and purple-fleshed sweet potato as an active ingredient. The composition of the present invention: significantly promotes the proliferation of human hair follicle dermal papilla cells (HHDPC); suppresses a nitric oxide-mediated inflammatory response; suppresses the generation of reactive oxygen species (ROS); increases the expression of the protein Bcl-2 which inhibits the apoptosis of HHDPC; and inhibits the expression of the proteins Bax, PARP-1 and caspase-3 which promote the apoptosis of HHDPC, and thus has an excellent effect of preventing or improving alopecia, etc. |
| WO2021095910 | Jejuuda Co Ltd (KR) | **Cosmetic composition containing horse oil and skin care method using same.** The present invention relates to a cosmetic composition containing horse oil and a skin care method using same, and more particularly, to a cosmetic composition containing horse oil and a skin care method using same, wherein unlike the conventional method in which an oil is applied to the skin at the very last stage of a basic skincare routine, the skin care method applies a horse oil ampoule consisting of liquid horse oil with excellent absorption without stickiness at the first stage of a basic skincare routine, thereby enhancing skin-improving effects, and applies the cosmetic composition to the skin in skin toner, serum, and cream formulations, sequentially, thereby enhancing antioxidant effects and the like, the cosmetic composition containing an extract of Isodon inflexus var. canescens (Nakai) Kudo, an extract of Korean dendropanax, a thyme extract, horse oil, etc. |
| WO2021067452 | Lonza Consumer Health Inc (US) | **Cannabinoid product for improving musculoskeletal healt.** The present disclosure is directed to a composition or nutritional product containing a cannabinoid in combination with an adjuvant, such as a Type II collagen. The different nutraceutical agents are capable of synergistically working together to improve the health and well-being of a human or animal. For instance, the nutritional product can be used in many different applications, such as to treat joint discomfort and pain, and/or to improve muscular health. |
| WO2021112298 | Nature In Lab Inc et al. (KR) | **Method for producing complex fermentation product of lichen-derived minerals and galactomyces.** The present invention provides: a method for extracting lichen-derived minerals; and a method for producing a galactomyces complex fermentation product. The galactomyces complex fermentation product is obtained by adding a mineral complex, which includes at least one mineral (Cu, Zn, Mg, Ca, and Ge, etc.) derived from lichens, in the process of fermenting galactomyces, and has the effects of regulating the osmotic balance of skin cells, activating keratin metabolism, alleviating inflammation, and moisturizing. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| WO2021071365 | Revolution Fibres Ltd (NZ) | **Nanofibre matrix made of natural polymers with natural functional ingredients for cosmetic products.** Described herein is a nanofibre matrix comprising 100% natural biopolymers selected from polysaccharides and/or proteins with optional functional ingredients for use as cosmetic products. More specifically, nanofibre matrix manufactured by electrospinning methods comprising a dry sheet without containing any preservatives, surfactants, solvents and crosslinkers. To use nanofibre cosmetic products, simply wet skin and then apply the nanofibre to skin. Functional ingredients may be optionally incorporated within the nanofibre matrix during electrospinning to provide different cosmetic effects. Functional ingredients offer skin benefits such as moisturizing, anti-ageing, wrinkle reduction, brightening, antioxidant and acne treatment. Functional ingredients can be essential oil where it is incorporated into nanofibre matrix to provide scent effect to cosmetic products. Functional ingredients can also be natural dye where it is incorporated in nanofibre matrix to make coloured nanofibres. Coloured nanofibres can be used for makeup products such as blush, eye shadow, eyebrow, nail polish, lipstick, contouring and hair dye product. The nanofibre matrix comprising 100% natural biopolymers with or without functional ingredients can be processed to assorted shapes or easily cut by consumers for using on different areas of skin for different purposes. |
| WO2021097584 | Univ Andres Bello et al. (CL) | **Agarophyton chilensis extract, rich in free fatty acids, as a nutraceutical or nutritional supplement, suitable for modulating PPAR-γ activity.** An Agarophyton chilensis extract, enriched with free fatty acids and PPAR-γ modulators, which comprises palmitic acid, stearic acid, myristic acid, oleic acid and 8-hydroxyeicosatetraenoic acid (8-HETE). A method for obtaining the extract. A nutraceutical composition which comprises the extract enriched with free fatty acids and PPAR-γ modulators, wherein said extract is suitable for treating or preventing health conditions that require neuroprotection, said neuroprotection involving the activation of PPAR-γ receptors. |
| WO2021071350 | Uninversite Internationale D´Agadir (MA) | **Basic composition for mouth or body hygiene or for health, comprising a ground substance or a powder or an extract from a plant of the genus white horehound or common horehound.** The invention relates to a pharmaceutical solution for preparation in liquid form composed of a ground substance or a powder or an extract from the plant "white horehound" and essential oils. This solution is presented to users in bottles and in sachets for greater practicality and ease of handling and transport. |
| ES2823599 | Univ Vigo (ES) | **Aqueous antioxidant extracts of vegetable raw materials, procedure of obtaining and their use in the composition of a cosmetic and/or dermatological product.** Extracts obtained from Cytisus scoparius flowers, Pleurotus ostreatus mushrooms, Brassica rapa leaves and Quercus robur acorns using microwave-assisted hydrodiffusion and combined with gravity (Microwave hydrodiffusion and gravity, MHG). These extracts were used in the formulation of moisturizing creams with sun protection made with different thermal waters, evaluating their chemical and bioactive stability, as well as their mechanical properties. |

| Bioaditivos alimentarios | | |
|---|---|---|
| Nº Publicación | Solicitante (País) | Contenido técnico |
| EP3799723 | ADM Wild Europe GmbH & Co KG (DE) | **Foamable composition and foam.** The present invention relates to a foamable composition comprising 0.05 to 10 wt% of a plant germ flour, 0.1 to 15 wt% of a thickening agent; 0.1 to 35 wt% of a natural fiber and water, based on the total weight of the composition. The invention further relates to a foam obtainable from said foamable composition, a method for producing said foamable composition comprising mixing the ingredients with water, the use of said foamable composition or said foam in a food product and a food product comprising said foamable composition or said foam. |
| WO2021105953 | Amyris Bio Products Portugal et al. (PT) | **Multifunctional extracts of sugarcane straw or bagasse and uses thereof.** Provided herein are extracts of sugarcane straw or bagasse, methods of preparing the extracts, and the use of the extracts in compositions that have antioxidant activity, anti-inflammation activity, and antimicrobial activity that can be used as multifunctional ingredients. Further provided are methods of using the extracts to treat or ameliorate conditions involving oxidation, inflammation, skin and food enzymes inhibition activity capacity and microbial growth. |
| WO2021069205 | Conopco Inc D/B/A Unilever et al. (US) | **Dressing composition comprising plant protein.** Food composition in the form of an oil-in-water emulsion comprising water, a first acidulant selected from the group consisting of lactic acid, benzoic acid, acetic acid, sorbic acid and mixtures thereof, structurant, selected from the group consisting of starch, flour, gum, fiber and mixtures thereof, 5 to 60 wt% of vegetable oil, non-soy plant protein having an average particle size of below 100 micrometers, and a second acidulant, having a pKa of 3.2 or lower, wherein the weight ratio between plant protein and vegetable oil is ≥ 0.3, and wherein the pH of the composition is of between 2.5 and 4.5. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| ES2817924 | Creaciones Aromaticas IND SA (ES) | **Solid heat-reversing sauce or cream.** Solid sauce or cream that comprises at least one gelling agent selected from gelatin, agar-agar, modified starch or combinations thereof, characterized in that gelatin, agar-agar, modified starch or combinations thereof are the only gelling agents present in the sauce or solid cream; and manufacturing procedure thereof. Also disclosed are blocks or slices of the solid sauce or cream as well as solid preparations useful for making the solid sauce or cream. |
| WO2021081049 | Kalamazoo Holdings Inc (US) | **Light stable natural yellow colorant systems in pickled and fermented vegetable applications.** The present invention comprises a novel natural yellow colorant system to enhance the appearance of pickled and/or fermented vegetable products. Individually ail-natural yellow pigments failed light stability investigations in pickled and/or fermented vegetable products - either the yellow hue of the brine solution faded, or the pulp/skin of the vegetable turned white, or both. Surprisingly combinations of these same individual natural yellow pigments not only created brine hues and vegetable coloring comparable to FD&C Yellow # 5 products but remained stable in accelerated Sight stability investigations designed to mimic the real-time shelf-life of the products. |
| WO2021086852 | Longrun LLC (US) | **Sugar substitute.** A ketogenic sweetener made from a combination of high intensity sweetener, medium intensity sweetener and soluble fiber. The process of making the ketogenic sweetener involves mixing the high intensity sweetener, medium intensity sweetener and soluble fiber at specific proportion to yield a homogenous composition. The ketogenic sweetener is ideal for diabetic individuals and people following ketogenic diets. The compositions of the invention are made from natural ingredients and have unique heat stable properties with low glycemic index and function as a prebiotic. |
| WO2021072012 | Rhodia Operations et al. (FR) | **Hydrophobically-modified polysaccharides and uses thereof.** Described herein are hydrophobically-modified polysaccharides, their manufacture, and their use in microencapsulation, typically of water- insoluble active materials. |
| WO2021086848 | Scherer Technologies LLC R P (US) | **Delayed release softgel capsules in higher pH environment.** Disclosed in certain embodiments is a delayed release softgel capsules comprise a fill material that is encapsulated in a pH dependent shell composition, the pH dependent shell composition including pectin and gellan gum. Also disclosed are methods of preparing any of the delayed release softgel capsules described herein and methods of use thereof. |
| WO2021104619 | Symrise AG (DE) | **Particulate products and method for production thereof.** The present invention relates to a method for producing an agglomerate, particulate product that contains one or more flavors and/or odorous substances. The shelf life of the particular product is significantly improved and the one or more flavors and/or odorous substances are protected from in particular oxidation by spraying the products with certain binders. The present invention also relates to particulate products that contain one or more flavors and/or odorous substances, preferably produced according to the method of the invention, and to the use of certain substances to improve the shelf life of particulate products that contain one or more flavors and/or odorous substances. |
| WO2021106839 | Taiyokagaku CO LTD (JP) | **Squid-like texture composition.** [Problem] To provide a squid-like texture composition. [Solution] A squid-like texture composition comprising a curdlan (A), a saccharide (B), and insoluble fibers (C), wherein the mass ratio of A:B:C is 100 : 5 to 450 : 1 to 100. In this case, the particle size of the insoluble fibers (C) is preferably such that 80 percent or more thereof passes through a 300-μm mesh, the average particle size thereof is preferably 100 μm or less. The saccharide (B) is preferably starch syrup. |
| WO2021076608 | Tate & Lyle Ingredients Americas LLC (US) | **Flavor altering and/or sweetness enhancing compositions and methods and food and beverage products based thereon.** The present disclosure provides flavor altering and/or sweetness enhancing compositions, methods, and food and beverage products using a soluble oligomeric component selected from soluble dietary fiber and polydextrose to alter flavor and/or enhance sweetness. |
| WO2021067568 | Univ California (US) | **Soy proteins for preparation of gels, fibers and films.** The present invention provides compositions of soy protein gel fibers, soy protein fiber membranes, and soy protein films. The present invention also provides methods of making the soy protein compositions and also uses of the compositions. |

| Bioproductos alimenticios para animales | | |
|---|---|---|
| Nº Publicación | Solicitante (País) | Contenido técnico |
| WO2021067429 | Ajinomoto Health & Nutrition North America Inc (US) | **Method for protecting protein from heat damage and reducing rumen degradability of methionine.** Protein-containing feedstuffs which contain at least one protein feed material and either methionine or at least one feed product which contains methionine are resistant to reduction of digestibility as a result of heat damage during drying. |
| WO2021066358 | Bioforce Co Ltd (KR) | **Honeybee feeding solution composition for improving honey collection, and preparation method therefor.** The purpose of the present invention is to prepare a feeding solution composition containing, as active ingredients, a seaweed composite extract, an Artemisia annua extract and a propolis extract, so as to improve the immunity of honeybees through a natural product derived from nature, and thus increase the population of honeybees and the egg yield of queen bees, thereby improving productivity of beekeeping farmers. The present invention provides a honeybee feeding solution composition comprising a seaweed composite extract, an Artemisia annua extract, a propolis extract, citric acid, sodium L-glutamate and vegetable oil, wherein the seaweed composite extract, the Artemisia annua extract and the propolis extract are obtained by performing hot water extraction at 40-60°C for 4-8 hours. |
| WO2021070891 | Chubushiryo Co LTD et al. (JP) | **Method for producing cattle feed, and cattle feed.** [Problem] To improve the palatability of a cattle feed containing sugar cane without using any other material having good palatability. [Solution] A feed for feeding cattle with sugar cane, wherein the sugar cane is used not in an unsqueezed state as such but preliminarily squeezed and divided into a squeeze cake (bagasse) and a juice, followed by remixing the bagasse with the juice to give a mixture. |
| WO2021116396 | DSM IP Assets BV (NL) | **Compressed TABLETS.** The present invention relates to compressed tablets comprising 3-nitrooxypropanol or derivatives thereof, gluten and a non-enzymatically browned bypass protein as well as to the production of such tablets. |
| WO2021078839 | DSM IP Assets BV (NL) et al. | **Animal feed composition.** A combination of alpha-galactosidases and xylanases in animal feed increases the availability of the gross energy (GE) and the Average Metabolizable Energy of the animal feed by hydrolyzing the complex carbohydrates of maize, soybean meal and other protein meal sources. The hydrolysis of the indigestible oligosaccharides by the combination results also in reducing their anti-nutritional effect. |
| WO2021119075 | IMS Trading LLC (US) | **Pet chew with an outer surface provided by a tubular shaped animal organ.** A chew for an animal with an outer surface provided by all or a portion of a tubular shaped animal organ, such as an organ provided by the foreskin of animal pizzle. More specifically, the present invention relates to a chew product with an outer surface provided by all or a portion of a tubular shaped animal organ and a method for forming such product where the tubular shaped animal organ enhances attraction and palatability for the animal. |
| WO2021099594 | Forfarmers Corp Services BV (NL) | **Process for making animal feed mash agglomerates.** The present disclosure relates to a process for the production of animal feed agglomerates having increased nutritional values and meeting or exceeding the industry standards for flowability. Also provided are animal feed agglomerates obtainable by the process of the disclosure, including animal feed agglomerates having increased nutritional value as well as good flowability, and which are preferably devoid of disadvantageous ingredients. |
| WO2021112371 | H U One Co Ltd (KR) | **Snack, comprising abalone, for companion animal and preparation method therefor.** The present invention relates to a snack, comprising abalone, for companion animals and a preparation method therefor. More specifically, the present invention relates to a snack, comprising abalone, for companion animals and a preparation method therefor wherein the abalone is prepared by steaming deshelled abalone viscera and flesh with pine leaf extract-containing liquid smoke at a high pressure, pulverizing same, and molding the pulverized viscera and flesh into a certain size. The snack for companion animals has an improved shelf life and organoleptic property and potentiates immunity in companion animals. |
| WO2021107796 | Hipromine Spolka Akcyjna (PL) | **Compound feed, feed supplement, bioutilization method of the agri-food industry by-products, method of breeding/rearing insects of the order diptera and their applications.** The invention relates to a method of bioutilization of the agri-food industry by-products, a method of breeding/rearing insects from the order Diptera, in particular the Black Soldier Fly species (Hermetia illucens), and a compound feed and a feed supplement for breeding/rearing said insects and the use of said compound feed and/or a feed supplement for the bioutilization of the agri-food industry by-products. |

| Nº Publicación | Solicitante (País) | Contenido técnico |
|---|---|---|
| WO2021070969 | Kaneka Corp et al. (JP) | **Phospholipid, and feed containing same for fish and shellfish.** Provided is a phospholipid to which DHA and/or EPA is bound, wherein: the DHA and/or the EPA is contained at a total amount of 2-50 wt% relative to the entirety of constituent fatty acids in the phospholipid; and (the total amount of DHA and/or EPA bound to position 2 of the phospholipid)/(the total amount of DHA and EPA bound to position 1 and position 2 of the phospholipid)(weight ratio) is 0.2-0.8. |
| EP3799721 | Mars Inc (US) | **Methods of treating animal proteins.** The presently disclosed subject matter provides methods of treating animal proteins and pet food products including the same. Methods include treating animal proteins with one or more base compounds to increase the pH thereof to provide for increased preservation and the reduction of spoilage of the animal protein. |
| WO2021064581 | White Dog Labs Inc (US) | **A feed ingredient comprising propionate and a selected by-product of fermentation.** Provided is a feed ingredient comprising propionate and a byproduct of fermentation of a feedstock by propionic acid-producing bacteria, wherein said feedstock comprises a carbon source and wherein said bacteria are of a class selected from the group consisting of Actinobacteria, Bacteroidia, Clostridia, Negativicutes and combinations thereof. Also provided are methods for manufacturing the feed ingredient and uses thereof. |

NIPO: 116-19-007-8

# VT BIOMASA PARA LA BIOECONOMÍA

## PATENTES

## 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
www.bioplat.org

**CIEMAT**
Avda. Complutense,40
28040 Madrid
Tel: 91 346 08 99
E-mail:uip@ciemat.es
www.ciemat.es

**OEPM**
Paseo de la Castellana, 75
28071 Madrid
Tel: 91 349 53 00
E-mail:carmen.toledo@oepm.es
www.oepm.es