



BIOENERGÍA: PROYECTOS EUROPEOS 2017

La Unión Europea está promoviendo intensamente el establecimiento y el desarrollo de una bioeconomía sostenible en Europa y uno de sus pilares esenciales se sustenta en el mayor aprovechamiento de los recursos de biomasa. Los esfuerzos en este sentido se ven impulsados por numerosos proyectos de investigación enmarcados en el Horizonte 2020 y otras convocatorias europeas.

En este Apartado se ofrece un listado de cuáles son los proyectos europeos relativos a las tecnologías de conversión de la biomasa para la obtención de energía cuya fecha de inicio se sitúa a lo largo del año 2017. Los proyectos se identificaron en la base de datos CORDIS de la Unión Europea utilizando distintas estrategias de búsqueda. Cabe destacar que entre ellos juegan un papel importante los relativos a la utilización de las algas y el diseño de factorías celulares (*cell factories*) de biocatalizadores, precursores de biocombustibles y otras sustancias de alto valor añadido.

Tabla 1. Proyectos europeos

Accordion Bioreactor: An innovative high capacity Accordion bioreactor technology for high performance and low cost microalgae production	
Duración: 2017-01-01 a 2020-04-30	Financiación: Horizon2020
Participantes:	
<ul style="list-style-type: none"> • Coordinador: Biopharmia AS (Noruega) 	
BioMIC-FUEL: Bio-inspired photonics for enhanced microalgal photosynthesis in biofuels	
Duración: 2017-01-01 a 2019-12-31	Financiación: Horizon2020
Participantes:	
<ul style="list-style-type: none"> • Coordinador: The Chancellor, Masters and Scholars of the University of Cambridge (Reino Unido) 	
BioReg: Absorbing the potential of wood waste in EU Regions and industrial bio-based Ecosystems	
Duración: 2017-01-01 a 2019-12-31	Financiación: Horizon2020
Participantes:	
<ul style="list-style-type: none"> • Coordinador: Cabinet d'Etudes Sur les Dechets et l'Energie (Francia) • Business Region Goeteborg AB (Suecia) • European Biomass Industry Association (Bélgica) • Association Regionale Biomasse Normandie (Francia) • Bios Bioenergiesysteme GmbH (Alemania) • Instytut Uprawy Nawożenia i Gleboznawstwa, Państwowy Instytut Badawczy (Polonia) 	

BIOROBURplus: Advanced direct biogas fuel processor for robust and cost-effective decentralised hydrogen production

Duración: 2017-01-01 a 2020-06-30

Financiación: Horizon2020

Participantes:

- **Coordinador:** Politecnico di Torino (Italia)
- Karlsruher Institut fuer Technologie (Alemania)
- Centre National de la Recherche Scientifique (Francia)
- Scuola Universitaria Professionale della Svizzera Italiana (Suiza)
- Centre for Research and Technology Hellas (Grecia)
- DBI-Gastechnologisches Institut GmbH Freiberg (Alemania)

C2B: Carbon 2 Butanol, a breakthrough technology in eco-innovation that cuts GHG emissions by converting industrial waste gases into chemicals and biofuel

Duración: 2017-01-01 a 2017-04-3

Financiación: Horizon2020

Participantes:

- **Coordinador:** Oakbio Ltd (Reino Unido)

DiReC-IL: Computer simulation of the dissolution and regeneration of cellulose from ionic liquids

Duración: 2017-01-01 a 2018-12-31

Financiación: Horizon2020

Participantes:

- **Coordinador:** Universitaet Wien (Austria)

FALCON: Fuel and chemicals from lignin through enzymatic and chemical conversion

Duración: 2017-01-01 a 2020-12-31

Financiación: Horizon2020

Participantes:

- **Coordinador:** Koninklijke Nederlandse Akademie van Wetenschappen-KNAW (Holanda)
- Helsingin Yliopisto (Finlandia)
- Progression-Industry BV (Holanda)
- Supren GmbH (Alemania)
- Winterthur Gas & Diesel AG (Suiza)
- Total Raffinage Chimie SA (Francia)

GENIALG: GENetic diversity exploitation for Innovative macro-ALGal biorefinery

Duración: 2017-01-01 a 2020-12-31

Financiación: Horizon2020

Participantes:

- **Coordinador:** Centre National de la Recherche Scientifique (Francia)
- The Scottish Association for Marinescience LBG (Reino Unido)
- Seaweed Energy Solutions AS (Noruega)
- Algaplus Producao e Comercializacao de Algas e Seus Derivados Lda (Portugal)
- Stichting Wageningen Research (Holanda)
- Sintef Fiskeri OG Havbruk AS (Noruega)

MEMPHYS: MEMbrane based Purification of HYdrogen System

Duración: 2017-01-01 a 2018-12-31

Financiación: Horizon2020

Participantes:

- **Coordinador:** Duale Hochschule Baden-Wuerttemberg (Alemania)
- Imperial College of Science Technology and Medicine (Reino Unido)
- Institut Jozef Stefan (Eslovenia)
- Forschungszentrum Juelich GmbH (Alemania)
- Hydrogen Efficiency Technologies (HYET) BV (Holanda)
- Borit NV (Bélgica)

TASAB: Towards a sustainable algal biorefinery

Duración: 2017-01-01 a 2019-12-31

Financiación: Horizon2020

Participantes:

- **Coordinador:** Aston University (Reino Unido)

FLORIAN: Automatic regulation of combustion process for wood stoves and fireplaces

Duración: 2017-02-01 a 2017-05-31

Financiación: Horizon2020

Participantes:

- **Coordinador:** Atech Elektronika D.O.O (Eslovenia)

HarvPelL: Upscale and redesign of a mobile harvesting and pelletizing disruptive all-in-one machine

Duración: 2017-03-01 a 2017-06-30

Financiación: Horizon2020

Participantes:

- **Coordinador:** SCM Produktions- Und Vertriebs GmbH (Austria)

OXIDISE: Interaction and kinetics of oxidative biomass degrading enzymes resolved by high-resolution techniques

Duración: 2017-03-01 a 2022-02-28

Financiación: European Research Council (ERC)

Participantes:

- **Coordinador:** Universitaet fuer Bodenkultur Wien (Austria)

LIGNINFIRST: The Lignin-First approach for the full valorisation of lignocellulosic biomass

Duración: 2017-03-01 a 2022-02-28

Financiación: European Research Council (ERC)

Participantes:

- **Coordinador:** Imperial College of Science, Technology and Medicine (Reino Unido)

ARTFUL: Structure-activity relationships of an emerging family of fungal lytic polysaccharide monoxygenases

Duración: 2017-04-01 a 2020-03-31

Financiación: Horizon2020

Participantes:

- **Coordinador:** Universite d'Aix Marseille (Francia)

CYCLOMB: Disruptive Cyclone-based technology for effective and affordable particulate matter emission reduction in biomass combustion systems

Duración: 2017-04-01 a 2020-03-31

Financiación: Horizon2020

Participantes:

- **Coordinador:** Solarbox Solar Solutions SL (España)
- KSM Stoker AS (Dinamarca)
- T.A.M.A. Aernova SRL (Italia)
- Universidad de Vigo (España)

TAILORCAT: Towards the selective hydrodeoxygenation and hydrogenation of levoglucosenone using base metal heterogeneous catalysts modified by atomic layer deposition

Duración: 2017-04-01 a 2020-03-31

Financiación: Horizon2020

Participantes:

- **Coordinador:** Universiteit Utrecht (Holanda)

VALUEMAG: Valuable products from algae using new magnetic cultivation and extraction techniques

Duración: 2017-04-01 a 2020-03-31

Financiación: Horizon2020

Participantes:

- **Coordinador:** National Technical University of Athens (Grecia)
- Università Degli Studi Della Campania Luigi Vanvitelli (Italia)
- Nomasico Ltd (Chipre)
- Innovacio i Recerca Industrial i Sostenible SL (España)
- Theracell Advanced Biotechnology Ltd (Reino Unido)
- Vertech Group (Francia)

MECHANISM: The effect of water on the Fischer-Tropsch reaction mechanism and kinetics over bimetallic Co-based catalysts: Theoretical and experimental studies

Duración: 2017-04-14 a 2020-04-18

Financiación: Horizon2020

Participantes:

- **Coordinador:** University of Cyprus (Chipre)

ECOCAT: Improving the economic feasibility of the biorefinery through catalysis engineering: enhancing the catalyst performance and optimizing valuable product yields

Duración: 2017-05-01 a 2019-04-30

Financiación: Horizon2020 (aprobado)

Participantes:

- **Coordinador:** Aston University (Reino Unido)

StrainBooster: Enforced ATP wasting as a general design principle to rationally engineer microbial cell factories

Duración: 2017-05-01 a 2022-04-30

Financiación: ERC (aprobado)

Participantes:

- **Coordinador:** Max Planck Gesellschaft zur Foerderung der Wissenschaften E.V. (Alemania)

TO-SYN-FUEL: The demonstration of waste biomass to synthetic fuels and green hydrogen

Duración: 2017-05-01 a 2021-04-30

Financiación: Horizon2020 (aprobado)

Participantes:

- **Coordinador:** Fraunhofer-Gesellschaft zur Foerderung der Angewandten Forschung E.V (Alemania)
- Engie Services Nederland NV (Holanda)
- Alma Mater Studiorum-Universita di Bologna (Italia)
- Acondicionamiento Tarrasense Asociacion (España)
- The University of Birmingham (Reino Unido)
- Susteen Technologies GmbH (Alemania)

CMHAlgae: Multifunctional Cellulose Magnetic Hybrid (CMH) nanomaterial for integrating downstream processing of microalgae

Duración: 2017-08-01 a 2019-08-31

Financiación: Horizon2020 (aprobado)

Participantes:

- **Coordinador:** Universite Catholique de Louvain (Bélgica)

NewCat4Bio: Innovative sol-gel strategies for the production of homogeneous, hydrothermally stable, and porous mixed metal oxide catalysts for biomass conversion applications

Duración: 2017-08-01 a 2019-07-31

Financiación: Horizon2020 (aprobado)

Participantes:

- **Coordinador:** Universite Catholique de Louvain (Bélgica)

Magyc: Integrated rational design of cell factories for high value compounds

Duración: 2017-09-01 a 2018-08-31

Financiación: Horizon2020 (aprobado)

Participantes:

- **Coordinador:** Silicolife Lda (Portugal)

NTpleasure: Non-thermal plasma enabled catalysis-separation system for upgrading biogas to methane

Duración: 2017-11-01 a 2019-10-11

Financiación: Horizon2020 (aprobado)

Participantes:

- **Coordinador:** The University of Manchester (Reino Unido)

ANÁLISIS DE PATENTES

Durante el primer trimestre de 2017 se han identificado en la base de datos WPI (World Patent Index) 1691 familias de patentes sobre tecnologías de conversión de la biomasa para la producción de energía. La mayoría de las referencias corresponde a invenciones para las que sólo se solicita protección en países asiáticos (Tabla 2). Con el fin de ofrecer una visión más global de los actores implicados, éstas se van a excluir del análisis que se va a realizar en este Apartado.

Teniendo en cuenta esta consideración, cabe señalar que el 76.6% de las familias se refiere a las tecnologías termoquímicas. El 21.4% y el 7.1% hacen referencia a las tecnologías bioquímicas y químicas, respectivamente. La tecnología de combustión es la que cuenta con mayor número de resultados, 40.5% del total, seguida de la de pirólisis/gasificación, con el 37.7%.

Tipos de tecnologías de conversión de la biomasa	Nº Familias (Todos los ámbitos de protección)	Nº Familias (Excluidas aquéllas con ámbitos de protección exclusivamente asiáticos)
Tecnologías termoquímicas	1438	193
Combustión directa	695	102
Gasificación/pirólisis	782	95
Tecnologías bioquímicas	207	54
Digestión anaeróbica	148	25
Fermentación de azúcares	61	30
Tecnologías químicas (transesterificación, Fischer-Tropsch, síntesis de metanol)	76	18
Nº total familia de patentes	1691	252

Tabla 2. Número de familias de patentes clasificados por tecnologías.
Nota: Alguna invención puede incluirse en más de una tecnología.

En la Tabla 3 se muestran los países líderes en protección. En primer lugar se encuentran las solicitudes internacionales (PCT), con 110 documentos; en segundo lugar se encuentra EE.UU., con 80. En tercer lugar y a distancia, se sitúa Alemania, con 25 referencias. En España, en el periodo analizado, se publicaron 6. En la Tabla 4 se recogen los ámbitos de protección más representativos de las invenciones correspondientes a las distintas tecnologías.

	País	Nº Documentos
1	PCT	110
2	EE.UU. (US)	80
3	Alemania (DE)	25
4	EP	18
5	Francia (FR)	17
6	Polonia (PL)	11
7	Rusia (RU)	8
8	Canadá (CA)	6
	España (ES)	6

Tabla 3. Ranking por países (excluyendo países asiáticos)

Tipos de Tecnología (Nº Documentos)			
	Termoquímicas	Bioquímicas	Químicas
PCT	78	28	10
EP	13	5	0
Alemania (DE)	21	5	2
Canadá (CA)	4	2	0
EE.UU. (US)	66	12	6
España (ES)	6	0	0
Francia (FR)	10	6	2
Holanda (NL)	5	0	0
México (MX)	4	1	0
Polonia (PL)	10	2	0
Rusia (RU)	6	1	1
Nº Familias totales	193	54	18

Tabla 4. Ámbitos de protección más solicitados por tecnologías (excluyendo países asiáticos)

En los Apartados posteriores se presenta una selección de los documentos de patentes identificados en este trimestre.

TECNOLOGÍAS TERMOQUÍMICAS

Patentes

COMBUSTIÓN DIRECTA		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2017001019	Ceneco UG Haftungsbeschränkt (DE)	Process and plant for processing and drying of solid materials in small pieces. A process and plant for drying of wood shavings, wood chips or other solid materials of organic and/or mineral origin in small pieces, in which - the material is predried by means of a first preheated drying gas in a first drying step, - the dried material from the first drying step is dried by means of a second preheated drying gas in a second drying step, - ambient air is heated and supplied as second preheated drying gas to the second drying step, - the dried material from the second drying step is cooled by means of a cooling gas, and - the cooling gas heated by cooling of the material and/or the second drying gas cooled in the second drying step is supplied as first drying gas to the first drying step.
CZ20150682	Česká Zemědělská Univerzita V Praze (CZ)	A device for drying and combustion of fuels with removal of NOx substances in combustion products. The device for drying biomass and combustion of fuels with removal of NOx substances in combustion products contains a boiler having the deNOx band (11), and further comprises a unit for volatilization of gases from biomass, out of which there leads the outlet (9) of the volatilized gas to the deNOx band (11) of the boiler and the outlet (2) of the biomass after volatilization to the boiler.
NL2013541	Drynovations B V (NL)	Method for the processing of biomass. Device for processing biomass, has first heat exchanger for condensing vapor of biomass, air outlet connected with inlet of combustor, vaporization device for performing evaporation process, and second heat exchanger for condensing vapor.
EP3124862	Ebara Env Plant Co Ltd (JP)	Heat transfer tube for fluidized-bed boiler. A heat transfer tube, for a fluidized-bed boiler, having a protector which has sufficient durability in a corrosive wear environment, while reducing an initial cost by avoiding a complex structure, considering maintainability such as installation and replacement, and lowering a risk of crack or deformation is disclosed. The heat transfer tube 1 for use in a fluidized bed of a fluidized-bed boiler includes a water tube 2 through which a fluid flows, a thin protector 4, a thick protector 3 made of casting which are provided at an outer circumferential side of the water tube 2 and are configured to protect the water tube 2, a heat-insulating layer 6 provided between the water tube 2 and the thin protector 4, and a fixing jig 5. The fixing jig 5 is fixed to the thick protector 3 to cause the fixing jig 5 to hold the thin protector 4 provided at the outer circumferential side of the water tube 2.
WO2017014299	Fujisaki Electric Co Ltd (JP)	Biomass power generation system using bamboo as main fuel, and method for combusting bamboo in said biomass power generation system. Provided is a biomass power generation system (1) equipped with: a combustion furnace (32) into which a primary air for efficiently combusting fuel on a fire grate (33) and a secondary air for carrying out secondary combustion of unburned matter and unburned gas generated on the fire grate (33) are blown; and a water pipe (39) for cooling the furnace wall of the combustion furnace (32) so as to lower the temperature thereof; wherein the flow velocity of the primary air is reduced, the furnace wall of the combustion furnace (32) is cooled by coolant water flowing in the water pipe (39), and bamboo serving as fuel is combusted.

COMBUSTIÓN DIRECTA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2017006343	Gondhalekar Santosh et al. (IN)	Method and system for converting animal excreta into energy and useful by-products. The present invention provides a method and a system for converting animal excreta into energy and useful by-products. The dewatering system (120) is provided for separating solid and liquid components from animal excreta. The separated solid and liquid components are processed separately using a pelleting system (130) and an anaerobic digester (140) respectively, to produce solid fuel pellets and biogas therefrom. The digestate obtained from anaerobic digestion of the liquid components is processed further using an aeration unit (150), followed by a filtration process to produce potable quality water therefrom. Water discarded from the filtration unit (160) is adapted of being used as a liquid fertilizer. Solid fuel pellets has high combustion efficiency and are capable of being used as fuel for power generation, commercial or residential heating and cooking. Further, burning of the solid fuel pellets produces ash that can be used as a solid fertilizer.
ES2597235	García Gómez José María (ES)	Dispositivo inyector para calderas de biomasa. Dispositivo inyector para calderas de biomasa que comprende un chasis (1) que incorpora un cilindro inyector (2) el cual empuja la biomasa por un conducto (3) a modo de compactador hacia la cámara de combustión (4) de la caldera (5); y donde dicho chasis (1) incorpora también un cilindro cargador (7) asociado a una compuerta (8) asociada a una boca de carga (9) de la biomasa, y donde dicha boca (9) incluye un detector de nivel (10) de sólidos que optimiza el nivel de carga; todo ello comandado por unos medios de control.
ES2597234	García Gómez José María (ES)	Sistema de generación de energía térmica. Sistema de generación de energía térmica que comprende una caldera de biomasa (1) unida a un conducto de evacuación de humos (2) unido a un sistema de ventilación forzada (3) encargado de llevar los humos de la combustión al ciclón (6) que en su parte inferior incorpora un depósito (7) para las cenizas decantadas por la fuerza centrífuga del ciclón; y donde, superiormente incorpora un ventilador axial (8), conectado con un segundo conducto de evacuación de humos (9) que desemboca en la chimenea (10) de la instalación, y cuya función es evacuar los humos tratados al exterior.
WO2017026027	Hitachi Shipbuilding Eng Co (JP)	Method for effectively utilizing energy in waste-incineration facility with ethanol production equipment. [Problem] To provide a novel method for effectively utilizing energy in waste-incineration facilities with ethanol production equipment, the method being capable of achieving a further improvement in energy recovery. [Solution] The method for effectively utilizing energy in waste-incineration facilities with ethanol production equipment according to the present invention is characterized in that an ethanol production step and a methane production step are conducted in the waste-incineration facilities including, provided thereto, ethanol production equipment where bioethanol is yielded from saccharides contained in biomass in general waste. In the ethanol production step, some of heavy stuff comprising raw garbage and wet paper materials is mixed with a pulp separated from lightweight stuff comprising dry paper materials and plastic materials, the heavy stuff and the lightweight stuff having been obtained by pretreating the general waste, and this mixture is fermented. In the methane production step, the remainder of the heavy stuff and/or a distillation residue resulting from the ethanol production step is fermented.
US2017049265	Heuchling Frederick Douglas (US)	Collapsible secondary-burn biomass stove and associated embodiments. A portable, collapsible secondary combustion biomass stove which maintains the environmental and efficiency benefits of a secondary-burn biomass stove while removing the need for the weight and volume of permanent insulation. The stove can be quickly and easily assembled or disassembled without the use of tools for storage and transport. The outer housing of the stove provides stability while shielding the user from the high temperatures of secondary combustion within the chimney and combustion chamber, and collapses for stove transport, insulation may be added to the stove using material indigenous to most campsites, whereby stove operating temperature and efficiency increases while toxic gas release and fuel consumption decrease.

COMBUSTIÓN DIRECTA

Nº Publicación	Solicitante (País)	Contenido técnico
DE102015008498	Karl Schröder Nachf Inh Karl-Heinz Schröder E K (DE)	Electrostatic filter for removing fine particulates from exhaust of small combustion installations. The invention relates to an electrostatic precipitator for the separation of fine dust from the exhaust gas from small firing installations, comprising a housing (1) in which a filter channel arrangement (8) is arranged with a multiplicity of filter channels (8a) extending parallel to one another, the filter channel arrangement (8) (7) for widening the flow cross section of the exhaust stream to be cleaned to the width of the filter channel arrangement (8) and a flow rectifier connected downstream of the diffuser (7). The object of the invention is to reduce the flow path for the exhaust gas to be cleaned in such an electrostatic filter and at the same time to improve the electrostatic dust separation. In addition, if possible, all filter channels should be equally involved in dust separation. In order to achieve this object, the invention provides that all filter channels (8a) of the filter channel arrangement (8) are flowed through from the bottom to the top, and that the flow rectifier is designed as a gap gap (10) which is adjustable in its gap width and whose channel length corresponds to the width of the filter channel arrangement (8) And whose adjustable nozzle jet reaches all inflow openings of the filter channels (8a) of the filter channel arrangement (8).
EP3115722	Ktb Invest Ivs (DK)	Method and drying plant material and utilising heat from the drying plant. A method and a plant for utilising heat from a drying plant for drying material in the form of particulate material, e.g. wood chips, shavings, sawdust, straw, wood pellets or bedding, including bedding that has been used in a stable. The method and the plant include a drying step for drying the particulate material, which is heated by hot oil. A boiler for heating the oil is connected with means for supplying at least a partial stream of the material to the boiler for burning the material in the boiler. In addition, the boiler has means for transmitting the combustion heat from flue gas to the oil before the oil is returned to the drying chamber. The plant also includes a heat exchanger by which a partial stream of the hot oil from the boiler is heating a circulating heating medium, such as water, from a heating conduit of the heating part of a central heating system for heating and/or hot water production for one or more buildings. In front of the heat exchanger there is preferably provided a condenser condensing vapour in the drying air and transmitting the heat to the heating medium for preheating and utilisation of the heat from the drying air.
US9566549	Rio Grande Valley Sugar Growers Inc (US)	Apparatus and method for cleaning gas streams from biomass combustion. A horizontal scrubber may be configured for removal of sulfur dioxide and particulate matter from a gaseous stream derived from the combustion of biomass, including, for example, sugar cane bagasse. The scrubber may include a horizontally disposed housing including an inlet configured to receive a gas stream derived from combusted biomass and an outlet. The scrubber may further include a manifold of liquid nozzles disposed within the housing that are configured to provide a spray of liquid droplets in a co-current orientation to the gas stream. An array of tubes may be oriented adjacent to the manifold of liquid nozzles and may be configured to receive the gas stream and liquid droplets from the nozzle array, but providing minimal resistance to material flow. To encourage flow, members of the tube array may include circular walls with a substantially uniform cross section.
GB2540241	Suirvale Dev Ltd (IE)	A lid of an outdoor biomass boiler. A reversible spigot 120 removably attached to a lid 100 of a biomass boiler comprises in a first orientation (fig 1) the spigot projects from an upper surface 103 of the lid and in combination with an orifice 132 in the lid is used to communicate fuel into the boiler; and a second orientation (fig 2) the spigot projects from underneath the lid into the boiler and in combination with a blanking plate 130 seals the orifice in the lid. The spigot has a flange 122 with a series of holes 123 enabling the spigot to be connected to the lid by bolts. A gasket 125 is provided between the flange and lid. The boiler may be an external biomass boiler. The lid may be rectangular and comprise a flat mid-section 103 between two sloped upper surfaces 102, 104 with the spigot mounted on the mid-section. Advantages include that a separate new lid does not need to be attached.

COMBUSTIÓN DIRECTA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2017014028	Taiheiyo Cement Corp et al. (JP)	Method for producing biomass fuel. [Problem] To make it easier to produce fuel from byproducts (palm oil byproducts) generated in the crude palm oil extraction process, and to improve, inter alia, the efficiency with which the fuel produced is transported. [Solution] A method for producing a biomass fuel provided with a washing/desalting step for performing desalting by washing the palm oil byproducts with water, a drying step for drying the washed/desalted palm oil byproducts, a pulverization step for pulverizing the dried palm oil byproducts, and a molding step for molding the pulverized palm oil byproducts. The chlorine content of the washed/desalted palm oil byproducts is preferably less than 1000 ppm, a rotary stirring continuous washing machine is preferably used in the washing/desalting step, the water content of the dried palm oil byproducts is preferably 20% by mass or less, the long fiber length of the pulverized palm oil byproducts is preferably 10 mm or less, the bulk density of the molded article obtained by the molding step is preferably 0.65 kg/L or higher, and the compressive strength of the molded article is preferably 1.5 N/mm ² or higher.
EP3112444	Total Marketing Services (FR)	Method for preparing acid fuel oil from the acidification of a soap stock of vegetable and/or animal origin. The present invention relates to a process for preparing a combustible acid oil derived from biomass, in particular resulting from the acidification of a neutralization paste obtained by a process for refining a vegetable and / or animal oil. The process according to the invention makes it possible to obtain a combustible acid oil with low water, ash, sulfur, calcium, phosphorus, sodium and optionally alkali metals, other than sodium, suitable for burning in industrial combustion plants.
FR3040142	Urbaser Environment (FR)	Process and installation for the treatment of residual household waste. The invention relates to a process for the treatment of residual household waste, which makes it possible to obtain a diversion rate greater than or equal to 80% by producing solid recovered fuels and compost, and by extracting glass, metals and recyclable plastics. The process is essentially characterized in that it includes: a first treatment phase comprising a granulometric sorting step without prior grinding using at least one double-sided rotary screen; This equipment has at its head a device making it possible to open all the containers enclosing the residual household waste; The double-meshed rotating screen separates the fractions, according to their native particle size, into three streams, a second treatment phase, specific to each of the three streams originating from the first phase and composed of several steps, making it possible to extract the recyclable products, To produce compost and to isolate the products used as a basis for the manufacture of solid recovered fuels, - a third phase of processing, consisting of several stages, of producing solid recovery fuels.

TECNOLOGÍAS BIOQUÍMICAS

Patentes

PIRÓLISIS/GASIFICACIÓN		
Nº Publicación	Solicitante (País)	Contenido técnico
US2017037319	Cool Planet Energy Systems Inc (US)	Method for biomass fractioning by enhancing biomass thermal conductivity. A method is disclosed for generating useful Chemical intermediates from biomass using a novel pyrolysis reactor that utilizes the inherent thermal properties of carbon under compression as the biomass is subjected to sequential or concurrent temperature ramps. The ramps are sufficient to volatilize and selectively create different components, while the pressure application aids the selective decomposition of the biomass.
WO2017035023	Entegris Inc (US)	Microcrystalline cellulose pyrolyzate adsorbents and methods of making and using name. A cellulosic carbon pyrolyzate material is disclosed, having utility as a gas adsorbent for use in gas storage and delivery devices, gas filters, gas purifiers and other applications. The cellulosic carbon pyrolyzate material comprises microporous carbon derived from cellulose precursor material, e.g., microcrystalline cellulose. In adsorbent applications, the cellulosic carbon pyrolyzate may for example be produced in a particulate form or a monolithic form, having high density and high pore volume to maximize gas storage and delivery, with the pore size distribution of the carbon pyrolyzate adsorbent being tunable via activation conditions to optimize storage capacity and delivery for specific gases of interest. The adsorbent composition may include other non-cellulosic pyrolyzate components.
US2017058127	Georgia Southern Univ Res and Service Found (US)	Production of nanocellulose and carbon black from lignocellulosic biomass. Disclosed herein are integrated processes for preparing useful materials from renewable biomass feedstocks. The materials include nanocellulose and bio-based carbon black. The processes are characterized by low energy input requirements. The nanocellulose and bio-based carbon black produced according to the disclosed processes have improved properties relative to nanocellulose and bio-based carbon black produced by more energy intensive processes.
US2017058219	Green Waste Energy Inc (US)	Pyrolysis processing of solid waste from a water treatment plant. The present invention provides methods and apparatus for treating waste, such as municipal waste via pyrolysis and yielding one or more of heat energy; electrical energy and fuel. In some embodiments, waste feed stock can be municipal waste in black bag form. In some the present invention additionally provides for processing of hundreds of tons of municipal waste each day.
US2017044452	Greyrock Energy Inc (US)	Blends of low carbon and conventional fuels with improved performance characteristics. The present invention provides a blended fuel and methods for producing the blended fuel, wherein a low carbon fuel derived from a renewable resource such as biomass, is blended with a traditional, petroleum derived fuel. A blended fuel which includes greater than 10% by volume of low carbon fuel has an overall improved lifecycle greenhouse gas content of about 5% or more compared to the petroleum derived fuel. Also, blending of the low carbon fuel to the traditional, petroleum fuel improves various engine performance characteristics of the traditional fuel.
DE102015215143	Hochschule Merseburg et al. (DE)	Method for generating weak gas by thermo-chemical complete or partial oxidation of solid biomass, to supply heat and electric power to engine or carburetor, involves supporting switching between fixed bed and fluidized bed. The method involves crushing and drying of biomass, arranging central air baffle under central air baffle oxidation zone, injecting preheated air through central air nozzle (7), and transferring materials to reaction chamber above central air baffle for forming a fluidized bed. The dried biomass is placed into pyrolysis storage (3), and complete conversion of residual reaction products is carried out. Cyclic ash discharge is carried out at bottom of high-temperature reactor. The level in reactor chamber is regulated and switching between fixed bed and fluidized bed is supported.
MX2014015447	Inst de Investigaciones Eléctricas (MX)	Process for generating electric power using synthesis gas obtained from biomass derived from bamboo and other wood species. The present invention refers to a process for generating electric power using synthesis gas resulting from biomass generated from bamboo and other wood species, said process including the conditioning of the synthesis gas and its use as a fuel in an electric power generator, where the resulting synthesis gas has a low Sulphur content and a content of hydrogen of at least 20%.

PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
PL412978	Inst Technik i Tech Specjalnych Spółka Z Ograniczoną Odpowiedzialnością (PL)	System for conducting pyrolysis of the constant biomass, waste plastics and used up tyres. A system for pyrolysis of solid biomass, waste plastics and worn out tires comprises a tubular reactor (RR) provided at the entrance of the burner gas or pellet (P) from the blower ejector (D), wherein on the front cover of the reactor tube (RR) is arranged gear chain driven by a gear motor (M) with electric control of the angular position, and at the base of the reactor positioned the adjustment of the angular position (R) in the actuator so that the arm control supports the rear portion of the reactor tube (RR), and at the outlet of the reactor tube (RR) is a coil (W). The reactor (RR) comprises a heating tube inner (1) mounted along the horizontal axis of the reactor, from which extend side branches, i.e. heating pipes side (2) connecting an inner tube of the heating pipe outer (3) located in the chamber pyrolysis (5) and the outside of the outer heating tube is a heat chamber (4) surrounded by a cylindrical mantle (6).
WO2017017838	Mitsubishi Heavy Ind Environmental & Chemical Eng Co Ltd (JP)	Carbide producing method and carbide producing device. This carbide producing method for carbonizing woody biomass (B) to produce carbides (C) comprises: a thermal decomposition step for carbonizing woody biomass (B) through thermal decomposition; an LHV calculation step for calculating the LHV of carbides (C) which are the carbonized woody biomass; and a supplied heat amount control step for controlling, on the basis of the calculated LHV, the amount of heat supplied per unit time to the woody biomass at the thermal decomposition step.
DE202016007348	Nienhaus Hugo (DE)	Plant for continuous production of plant coke from biomass. Plant for the continuous production of plant coke from a biomass particle in a bed as a moving bed, comprises a shaft reactor (211) with a shaft reactor trough (71) comprising a head end and a foot end (81), at least one particle conveying device for transporting the biomass particles into the shaft reactor, at least one ventilation metering device for feeding the air into the shaft reactor, and a lattice arranged in a transition region between the central section of the shaft reactor and the foot end for supporting the bed in an interior of the shaft reactor.
CA2937608	Pichach Gary (CA)	Subterranean gasification system and method. A system and method for gasification of a feedstock in a subterranean formation to produce syngas is described. An injection well is completed in the formation to inject an oxidant, provide an ignition source and convey the feedstock that includes water and one or more of a biomass, waste plastic, coal, bitumen and petcoke. Volatilized hydrocarbons and gaseous reaction products are simultaneously withdrawn from a producer well from the subterranean formation to the surface. This syngas product is treated at the surface for power generation or conversion to transportation fuels and/or plastics. This method provides a low capital cost gasification unit which is capable of processing a variety of feedstock mixtures.
WO2017042129	Shell Int Research (NL)	Conversion of biomass into a liquid hydrocarbon material. The present invention provides a process for producing liquid hydrocarbon products from a biomass, biomass containing and/or biomass-derived feedstock, said process comprising the steps of: a) contacting the feedstock with a first hydrolysis catalyst composition and molecular hydrogen in a first hydrolysis reactor vessel at a temperature in the range of from 350 to 600°C and a pressure in the range of from 0.50 to 7.50MPa, to produce a product stream comprising partially deoxygenated hydrolysis product, H ₂ O, H ₂ , CO ₂ , CO, C ₁ - C ₃ gases, char and catalyst fines; b) removing said char and catalyst fines from said product stream; c) hydroconverting said partially deoxygenated hydrolysis product in a hydroconversion reactor vessel in the presence of one or more hydroconversion catalyst compositions and of the H ₂ O, CO ₂ , CO, H ₂ , and C ₁ - C ₃ gas generated in step a), to produce a vapour phase product comprising substantially fully deoxygenated hydrocarbon product, H ₂ O, CO, CO ₂ , and C ₁ - C ₃ gases, wherein one or more of the first hydrolysis catalyst composition and the hydroconversion catalyst composition is prepared by a process comprising combining a porous support with one or more catalytically active metals selected from Group VI and Group VIII of the Periodic Table, thereby forming a catalyst precursor having a volatile content, and reducing the volatile content of the catalyst precursor in one or more steps, wherein at least one volatile content reduction step is performed in the presence of one or more sulfur containing compounds; and wherein the catalyst precursor does not reach calcining temperatures prior to said at least one combined volatile content reduction-sulfurizing step.

PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
W02017044748	Sundrop Fuels Inc (US)	An integrated process plant having a biomass reforming reactor using a fluidized bed. An interconnected set of two or more stages of reactors to form a bio-reforming reactor that generates syngas for a number of different liquid fuel or chemical processes is discussed. A first stage includes a circulating fluidized bed reactor that is configured to cause a chemical devolatilization of the biomass into its reaction products of constituent gases, tars, chars, and other components, which exit through a reactor output from the first stage. A second stage of the bio-reforming reactor has an input configured to receive a stream of some of the reaction products that includes the constituent gases and at least some of the tars as raw syngas, and then chemically reacts the raw syngas within a vessel of the second stage to make the raw syngas from the first stage into a chemical grade syngas by further cracking the tars, excess methane, or both.
W02017015022	Synata Bio Inc (US)	Methods for sustaining the viability of microorganisms during a cessation of syngas flow and processes for storage and reactivation of microorganisms. The methods are disclosed for sustaining a population of microorganisms in an aqueous fermentation broth used in a process to convert syngas to alcohol when the supply of syngas is impaired. The methods involve supplying at least one formate moiety at a rate and amount sufficient to maintain the population of microorganisms. The introduction of the formate moiety also results in the production of at least one metabolic compound other than ethanol and/or acetate by the microorganisms. The metabolic compound can comprise at least one energy storage compound which can be used to support the microorganisms during processing, storage and reactivation.
EP3138892	Synthopetrol (FR)	Use of multifunctional magnetic catalysts for the transformation of biomass. The present invention relates to the use of a heterogeneous solid catalyst comprising or consisting of a metal complex linked by covalent bonds and / or by Van der Waals type interactions on a magnetic carrier for the implementation of a hydrotreatment reaction of gas derived from the pyrolysis of a substrate, the said hydrotreatment reaction being carried out with hydrogen and with said gas in the presence of said catalyst and leading to a gaseous phase, said gaseous phase leading by a step of cooling to the production of a liquid phase formed of liquid biofuel.
PL412733	Tech Invest House Spółka Z Ograniczoną Odpowiedzialnością (PL)	Method for processing biomass to high-energy fuel. Method for converting biomass into high-energy fuel by carbonizing process, involves fixing heat exchanger to reactor, producing charred biomass to biogas system by movable assembly, and placing screen on road tractor.

TECNOLOGÍAS BIOQUÍMICAS

Patentes

DIGESTIÓN ANAERÓBICA		
Nº Publicación	Solicitante (País)	Contenido técnico
PL2449086	Andersen Uno (NO)	<p>A device for the production of biogas from organic waste. A device for biological degradation of organic material and for producing biogas from said degradation, comprising a closed container (4) with a filling opening (12) for the organic material and discharge openings (5, 18) for the degradation products and one or more rotary elements (26) mounted on a shaft (24) and arranged for rotation in the container. Each rotary element (26) comprises at least one plate-shaped element (28; 28a-c) and a moving device (30) for moving the organic material from a first side (30a) of the moving device to a second side (30b) of the moving device. The plate-shaped element comprises a cylinder body (28; 28a-c) connected to the moving device (30), concentrically about the shaft (24).</p>
CA2892390	Axsiom Man Inc (CA)	<p>Advanced waste treatment for forestry product sludges. The invention described herein is a method of treating sludges or other wastes containing organic compounds to generate biogas and to recover useful products from those wastes including sulfur compounds. The Kraft pulp process which utilizes sulfide ions (S²⁻) as a feedstock to strengthen paper through lignin or other non-cellulose material removal is a particular but non-exclusive application for this invention. The generation of biogas from forestry product wastes is indicated in part because of the large concentration of carbon-compounds in the waste which produces a high yield of biogas containing methane, carbon dioxide, and hydrogen sulfide. The hydrogen sulfide in the biogas is undesirable because of its toxicity and the regulatory barriers to its presence and use in natural gas streams. Preferential removal of the hydrogen sulfide (H₂S) is performed with a gas-liquid Interaction (scrubber) of the biogas with an alkaline solution, preferably containing caustic (NaOH). The configuration and parameters of the scrubber is described herein. Optionally, the capture of H₂S is performed with a "white liquor" solution from a Kraft pulp and paper process and optionally recycled for further use. In the Kraft paper process. Other Kraft process gases, such as methyl mercaptan (CH₄S), can also be captured in an alkaline solution for similar purposes. An additional method of producing and treating biogas contaminated with sulfur compounds is described. This method describes a preferential treatment of the organic waste at a lower temperature (below 35°C) to enhance the production of these sulfur gases by sulfur reducing bacteria (SRB) followed by a higher temperature (above 35°C) methanogenic biogas formation step to produce Wages essentially free of reduced sulfur compounds. A method of capturing less water soluble reduced sulfur gases, such as dimethyl sulfide (C₂H₆S) and dimethyl disulfide (C₂H₆S₂), using a solution containing methanol is also disclosed with an optional method of electrochemical treatment of the dissolved gases. Finally, the biogas process may also constitute one step of a combined treatment process for forestry product wastes which may include a step of recycling other nutrients for enhanced waste digestion including nitrogen and phosphorus.</p>
US2017050892	Council Scient Ind Res (IN)	<p>Anaerobic column reactor for biodegradation of wastes and the process thereof. The present invention relates to an anaerobic column reactor for biodegradation of wastes. Particularly the present invention relates to a process for conversion of biodegradable wastes to biogas and compost. More particularly, the present invention relates to an anaerobic reactor with unique arrangement of expanded and constricted portions alternatively placed vertically over each other which enhances the mixing pattern and thereby the mass transfer rates while controlling the biomass washout by regulating the upflow liquid velocity.</p>

DIGESTIÓN ANAERÓBICA

Nº Publicación	Solicitante (País)	Contenido técnico
EP3111739	Easymetha (FR)	Device for dry methanation of organic material comprising manure. The present invention relates to a device (1) for the dry methanization of organic matter (2) comprising manure. The device comprises at least one digester (3) comprising at least one collecting and feeding zone (4) for the organic material (2) to be digested, a digestion channel (5) having a gas generating zone (6) and a gas collecting zone (12) arranged above the gas generating zone (6). The digester further comprises a buffer evacuation and storage zone (7) for the digested organic matter (9) in connection with the digestion path.
DE202016006876	Lehmann T (DE)	System for digestion of highly lignocellulose-containing biomass, and for biogas production or for material application. System for the digestion of highly lignocellulose-containing biomass, is claimed. The apparatuses and methods for processing biomass are arranged modularly and matched.
WO2016185438	Micoperi Blue Growth S.R.L (IT)	Plant and method for producing microorganisms in aquaculture. A plant for producing microorganisms in aquaculture, comprising at least one container for a liquid culture medium suitable for growing microorganisms. The container is placed inside a greenhouse equipped with a system for controlling the internal environmental conditions. Preferably, the greenhouse is associated with a plant producing biogas by means of anaerobic digestion, which produces electrical power that is supplied to the equipment fitted in the greenhouse, and produces thermal energy for heating the greenhouse.
US2017044575	Novus Energy (US)	Methods of anaerobic digestion of biomass to produce biogas. Improved methods for anaerobic digestion of organic matter to produce biogas. Among the improvements given are including ferric iron in a hydrolysis reactor to increase the rate and efficiency of anaerobic hydrolysis to provide substrates for methanogenesis. A solids separation step is added after hydrolysis and before methanogenesis to improve the efficiency of the methanogenesis step. Other improvements involve using separate tanks for the hydrolysis and methanogenesis stages and using two (or more) methanogenesis tanks in sequence, and switching the order of the two (or more) methanogenesis tanks periodically.
EP3115342	N.R.E RES S.R.L (IT)	Plant and method to treat waste. A plant for treating waste comprising a treatment tank (12) configured to contain the waste and a separation liquid to separate, by floating, in the waste, parts of inorganic material from parts of organic material. The plant comprises an apparatus for anaerobic digestion (14) and a delivery circuit (13) that connects the treatment tank (12) and the anaerobic digestion apparatus (14) in order to transfer the separation liquid and the organic material from the treatment tank (12) to the anaerobic digestion apparatus (14), configured to treat the organic material separated in the treatment tank (12) and to produce combustible gas and biomass.
WO2017006067	Pastre Frédéric (FR)	Facility and method for sequentially treating waste, containing organic matter, with a view to recovering energy from said waste. The invention relates to a facility that includes a plurality of compartments, the volume of which is greater than 1000 cubic meters, and sealed separation means that are located between said compartments and can be covered by a sealed cover. Each compartment includes means for capturing the gas fraction resulting from the decomposition of the waste, and means for circulating the liquid fraction present from an accumulation zone to the top of the treated waste mass. The waste treatment method associated with the facility includes, for each compartment: an individual cycle starting with the filling phase, followed by the anaerobic digestion phase (together with capturing biogas materials for recovery), then ending with the phase for removing the remainder of the waste, thus making a new treatment cycle possible in the compartment in question. The entire unit is controlled in accordance with a sequence made up of the cycles from the various compartments, starting consecutively with a lag therebetween that is calculated according to various key parameters. The facility combines all the conditions favorable for methanogenesis and complete biogas capture and aims for digestion of 90% of the fermentable fraction of the waste. The facility is a compromise between the landfill capacity and the anaerobic digestion efficiency of the methanizers. The facility has the advantage of producing a waste remainder at the end of treatment that is easily removable from the compartments and has the required characteristics (targeted particle size and dryness, high calorific value) for efficient, profitable heat recovery.

DIGESTIÓN ANAERÓBICA

Nº Publicación	Solicitante (País)	Contenido técnico
PL2767584	Politechnika Łódzka (PL)	Method for reduction of carbon dioxide in biogas. The basis of the present invention is a method of reducing the level of carbon dioxide during the biological purification of biogas conducted in devices for the purification of biogas, particularly a biofilter loaded with a biological filter bed sprinkled with a mineral medium, containing immobilised microorganisms capable of degrading hydrogen sulphide, based on the fact that the process is conducted under anoxic conditions using a consortium of microorganisms collected from sulphur-rich natural environments, the biological filter bed is sprinkled with a medium in the form of a solution containing nitrates of alkali metals of the I and II group, wherein the concentration of nitrate ions in the medium is in the range of 20 to 2500 mg/l, preferably in the range of 50 to 1000 mg/L.
AT517476	Univ Wien (AT)	Determination of status of a microbe culture in microbial methanation process. Determining status of a microbe culture in microbial methanation process using hydrogenotrophic methanogenic microorganism, comprises measuring at least one culture parameter including concentrations of nutrients and metabolites, preferably amino acids, in culture medium and gas partial pressures, and correlating the measured values of the culture parameter with the status of the culture.
PL413296	Univ Wroctawski (PL)	Method for preparation of meadow biomass for biogas generation. Preparing meadow biomass for biogas production, comprises heat treatment by freezing at -27° C for 90 days. The method provides biomass, among other things, to obtain a substrate for the production of fuels (biogas) with an average content of methane exceeding 50%, which can be used for the production of electricity and heat, as well as management often uncomfortable biodegradable waste, including biomass meadow which is essential for the protection of the environment.

TECNOLOGÍAS BIOQUÍMICAS

Patentes

FERMENTACIÓN DE AZÚCARES		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2016207448	Abengoa Bioenergía Nuevas Tecnologías SA (ES)	Cellulolytic compositions comprising monooxygenase polysaccharide enzymes with improved activity. The invention relates to methods and compositions for stabilising and increasing the activity of enzymatic mixtures comprising GH61 peptides (PMO or monooxygenase polysaccharide) used for the breakdown of cellulosic material during the saccharification step of methods for the production of biofuels. This improvement is achieved by the addition of a nickel cation to said enzymatic mixtures before and/or during the saccharification step. In this way, the invention provides compositions comprising PMOs, cellulolytic enzymes and a nickel cation, as well as methods for preparing said compositions and methods for producing fermentable sugars and bioproducts, preferably bioethanol, on the basis of cellulosic biomass, in which said compositions are used.
WO2017017292	Abengoa Bioenergía Nuevas Tecnologías SA (ES)	Expression of recombinant beta-xylosidase enzymes. The invention relates to a Myceliophthora thermophila cell, which expresses a nucleotide sequence that codifies a recombinant beta-xylosidase enzyme comprising an amino-acid sequence having at least 70% identity with SEQ ID NO: 1, an enzymatic composition comprising said cell and/or the recombinant enzyme with the beta-xylosidase activity expressed by said cell, the use of this host cell, the recombinant enzyme with the beta-xylosidase activity expressed by said cell or the composition for the degradation of biomass, and a method for producing biological products, preferably bioethanol, comprising the use of said host cell, the recombinant enzyme with the beta-xylosidase activity expressed by said cell or said composition.
US9533929	Cater Tech (US)	Direct catalytic conversion of sugars to ethanol. Sugars comprising the monosaccharides glucose and fructose, and the disaccharides sucrose and mannose are catalytically converted to ethanol at ambient temperature in a sulfate fortified acid medium in the presence of transition metal compounds possessing a degree of symmetry. This is not a fermentation process but is a catalytic chemical process where conversion efficiency is improved by saturating the acidic reaction mixture with inorganic sulfate salts to reduce competitive reactions. Ethanol formed during the reaction may be removed by distillation, following injection of nitric acid, facilitating a continuous process.
WO2017037745	Hindustan Petroleum Corp Ltd (IN)	An integrated process for production of carbohydratases, ethanol, and xylitol using an isolated candida strain. The present disclosure discloses a novel strain of Candida tropicalis (MTCC 25057) which can grow in a wide range of process conditions (temperature, pH), and in the presence of high concentrations of lignocellulosic inhibitors. The said strain has the capacity for simultaneous production of cellulases and xylanases from fermentation of sugars from lignocellulosic mass for production of ethanol, and xylitol.
WO2017026027	Hitachi Shipbuilding Eng CO (JP)	Method for effectively utilizing energy in waste-incineration facility with ethanol production equipment. [Problem] To provide a novel method for effectively utilizing energy in waste-incineration facilities with ethanol production equipment, the method being capable of achieving a further improvement in energy recovery. [Solution] The method for effectively utilizing energy in waste-incineration facilities with ethanol production equipment according to the present invention is characterized in that an ethanol production step and a methane production step are conducted in the waste-incineration facilities including, provided thereto, ethanol production equipment where bioethanol is yielded from saccharides contained in biomass in general waste. In the ethanol production step, some of heavy stuff comprising raw garbage and wet paper materials is mixed with a pulp separated from lightweight stuff comprising dry paper materials and plastic materials, the heavy stuff and the lightweight stuff having been obtained by pretreating the general waste, and this mixture is fermented. In the methane production step, the remainder of the heavy stuff and/or a distillation residue resulting from the ethanol production step is fermented.

FERMENTACIÓN DE AZÚCARES

Nº Publicación	Solicitante (País)	Contenido técnico
WO2016201360	ICM INC (US)	Cellulosic biofuel and co-products. This disclosure describes processes for using biomass feedstock to produce a fermented product and co-products. The process includes washing the biomass feedstock, pretreating the washed feedstock, hydrolysis and fermentation of the pretreated feedstock(s) to produce cellulosic biofuel and co-products. The processes may also include yeast hydrolysis and aerobic propagation.
WO2017029410	Inbicon AS (DK)	Process of lignocellulosic biomass conversion with addition of raw sugar juice. The current invention concerns methods and products related to the production of bioproducts such as alcohol from lignocellulosic biomass. In particular, methods are disclosed comprising the addition of sugar and/or carbohydrate comprising raw juices prior to enzymatic hydrolysis of pretreated lignocellulosic biomass.
WO2016193576	Lesaffre & Cie (FR)	Yeast propagation simultaneous with saccharification. The invention relates to a method for propagating yeast, for use in the production of a fermentation product from lignocellulosic biomass, including the steps that consist of: a. providing a reactor; b. placing in contact in said reactor: a population of yeasts capable of metabolising pentoses and hexoses, with 0.2 to 2.0 g of yeast solids per kg of prepared complete medium, raw marc from the pretreatment of the lignocellulosic biomass, with a solids content (MS) of 8 % to 15 %, nutrients, and cellulases, with 5 to 15 mg of proteins per gram of MS; and c. incubating the mixture at a temperature of 25 °C to 38 °C, preferably 28 °C to 33 °C, in microaerobiosis, in which the saccharification of the raw marc and the growth of the yeast are carried out simultaneously.
WO2017037362	Lesaffre & Cie (FR)	Yeast strains co-expressing exogenous glucoamylases, the method for obtaining said yeast strains and the use thereof to produce bioethanol. The present invention relates to enhanced <i>Saccharomyces cerevisiae</i> yeast strains. The invention is characterized in that these strains co-express a gene that codes for a fungal glucoamylase and a gene that codes for the glucoamylase of <i>Saccharomyces cerevisiae</i> var. <i>diastaticus</i> . The present invention also relates to a method for obtaining these yeast strains, said method including the following steps: a) genetically modifying a yeast of <i>Saccharomyces cerevisiae</i> such as to make said yeast co-express a gene that codes for a fungal glucoamylase and a gene that codes for a glucoamylase of <i>Saccharomyces cerevisiae</i> var. <i>diastaticus</i> , b) culturing and fermenting the strain obtained in step a) on a dextrin medium, c) selecting the strains having fermentation kinetics at least no lower than those of the strain deposited, pursuant to the Budapest Treaty, on 9 July 2015 at the Collection Nationale de Cultures de Micro-organismes (CNCM) under number I-4999 in the same conditions. The yeast strains according to the invention are particularly of interest in the production of bioethanol.
WO2016196202	Novozymes AS (DK)	Polypeptides having protease activity and polynucleotides encoding same. New polypeptide having protease activity, for preparing composition, e.g. enzymatic composition for producing fermentation products from starch-containing material, and for recovering oil from fermentation product production.
RO131499	Univ De Științe Agricole Și Medicină Veterinară a Banatului Regele Mih (RO)	Process for biorefining sugar-bearing plants and extracting sugars for preparation of biofuels and other biocompounds. The invention relates to a process for biorefining sugar-bearing plants for biofuels preparation. According to the invention, the process comprises the following steps : a. disintegrating the sugar plant biomass into fragments of 0.2...1 cm and silaging them in the presence of an aqueous ethanol solution; b. extracting a first portion of sugars; c. adding an ethanol solution and harvesting a new portion of sugars; d. repeating the extraction up to a concentration of minimum 40 mg/ml sugars in the extract; e. recovering the ethanol from the extract; f. fermenting the portions of sugar solutions; g. separating the fermentation products and using them; h. enzymatically hydrolyzing a bagasse resulted after the extraction of sugars and fermenting the hydrolysate for preparing the lignocellulose ethanol; i. separating the ethanol and j. anaerobically digesting the liquid residue from steps g. and i. and solid residue from the preparation of lignocellulose ethanol to result in biogas and organic fertilizer.

FERMENTACIÓN DE AZÚCARES

Nº Publicación	Solicitante (País)	Contenido técnico
AU2016256713	Xyleco Inc (US)	Bioprocessing. Fermentation method used for converting low molecular weight sugar into alcohol, by functionalizing inorganic fibers with particle beam, and contacting with low molecular weight sugar, and fermenting microorganism immobilized on fibers.
US2017066736	Xyleco Inc (US)	Conversion of biomass. Biomass feedstocks (e.g., plant biomass, animal biomass, and municipal waste biomass) are processed to produce useful products, such as fuels. For example, systems are described that can convert feedstock materials to a sugar solution, especially, xylose, which can then be chemically converted to furfural and furfural-derived products.

TECNOLOGÍAS QUÍMICAS

Patentes

DIGESTIÓN ANAERÓBICA		
Nº Publicación	Solicitante (País)	Contenido técnico
FR3037255	Biocarb (FR)	Supercritical fluid extraction of oily products or specific molecules from vegetable material. A process for extracting oily products or specific molecules of interest from solid plant material, such as vegetable / oilseed seeds, macroalgae or microalgae, by supercritical fluid, in which a plurality of containers (10) move On a stationary station conveyor (12), said method comprising at least the following steps: (a) a step in which the plant material is loaded into one of said containers; (B) a step in which said container is subjected to the flow of a supercritical fluid capable of extracting oily products contained in said plant material; (C) a step in which the flow of the supercritical fluid loaded with oily products contained in said plant material is introduced into a separator; (D) a separation step in which at least one liquid or solid phase is recovered in the separator; (E) An unloading step in which the cakes of said container are collected, said method being carried out in such a way that steps a), b) and e) are carried out simultaneously, each on at least one container (10) moving successively from a station where a given step is performed to another station where the next step is carried out.
WO2017011381	Cool Planet Energy Systems Inc (US)	Biofuel production using nanozeolite catalyst. A method of converting biovapors to biofuel includes directing biovapors derived from decomposition of biomass, said biovapors comprising at least C5 and C6 compounds, into a catalytic reaction chamber; and contacting the biovapors with a catalyst composition comprising a nanozeolite.
US2017065964	Crystaphase Products Inc (US)	Heterogeneous catalyst for transesterification and method of preparing same. A transesterification catalyst that is heterogeneous and a method for preparing said transesterification catalyst are provided. The catalyst can be used in a variety of transesterification reactor configurations including CSTR (continuous stirred tank reactors), ebullated (or ebullating) beds or any other fluidized bed reactors, and PFR (plug flow, fixed bed reactors). The catalyst can be used for manufacturing commercial grade biodiesel, biolubricants and glycerin.
US2016355851	DSM IP Assets BV (NL)	Biological oils and production and uses thereof. The present invention provides biological oils and methods and uses thereof. The biological oils are preferably produced by heterotrophic fermentation of one or more microorganisms using cellulose-containing feedstock as a main source of carbon. The present invention also provides methods of producing lipid-based biofuels and food, nutritional, and pharmaceutical products using the biological oils.
WO2017008135	Eco 100 Desenvolvimento Sustentado Ltda (BR)	Integrated process for producing biodiesel by carrying out the steps of saline demulsification, distillation and esterification of fatty acids and derivatives thereof. The present invention relates to an integrated process for producing biofuels by carrying out the integrated steps of saline demulsification, distillation and esterification of fatty acids and derivatives thereof, which involves breaking down stable emulsions of fatty acids and derivatives thereof by the separate or combined use of physical processes, as well as by the saline demulsification of fatty residues known as aqueous emulsions, said process exhibiting improved yields in the production of biodiesel using physical processes, such as screening, filtration and distillation of the extracted fat, followed by the processes of esterification and transesterification.

DIGESTIÓN ANAERÓBICA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2017039741	Fulcrum Bioenergy Inc (US)	Fuels and fuel additives that have high biogenic content derived from renewable organic feedstock. Fuel and fuel additives can be produced by processes that provide Fischer-Tropsch liquids having high biogenic carbon concentrations of up to about 100% biogenic carbon. The fuels and fuel additive have essentially the same high biogenic concentration as the Fischer-Tropsch liquids which, in turn, contain the same concentration of biogenic carbon as the feedstock.
WO2017018695	SK Chemicals Co Ltd (KR)	Method and apparatus for preparing biodiesel from oil containing polar lipid. A method and an apparatus for preparing biodiesel from an oil material containing a polar lipid such as phospholipids (PLs) and glycolipids (GLs) are disclosed. The method for preparing biodiesel comprises the steps of: obtaining a by-product containing crude fatty acids and glycerin by hydrolyzing an oil containing a polar lipid; separating fatty acids from a by-product layer containing glycerin and water by carrying out layer separation of the by-product, which is generated through the hydrolysis reaction and contains crude fatty acids and glycerin; obtaining a fatty acid alkyl ester by carrying out an esterification reaction through a reaction of the separated fatty acids and an alcohol; and obtaining biodiesel fuel by purifying the fatty acid alkyl ester.
WO2017044748	Sundrop Fuels Inc (US)	An integrated process plant having a biomass reforming reactor using a fluidized bed. An interconnected set of two or more stages of reactors to form a bio-reforming reactor that generates syngas for a number of different liquid fuel or chemical processes is discussed. A first stage includes a circulating fluidized bed reactor that is configured to cause a chemical devolatilization of the biomass into its reaction products of constituent gases, tars, chars, and other components, which exit through a reactor output from the first stage. A second stage of the bio-reforming reactor has an input configured to receive a stream of some of the reaction products that includes the constituent gases and at least some of the tars as raw syngas, and then chemically reacts the raw syngas within a vessel of the second stage to make the raw syngas from the first stage into a chemical grade syngas by further cracking the tars, excess methane, or both.
WO2017042804	Technion Res & Dev Foundation (IL)	Method for combined preparation of saccharides, alcohols and biodiesel. The present invention provides, inter alia, a method for combined preparation of saccharides, alcohols (biofuel) and biodiesel using a composition comprising interior hydrophobic or hydrophilic medium encapsulated by a layer comprising cellulose, cellulose derivative material, and/or starch surrounded by a hydrophilic or hydrophobic medium, respectively.
WO2016203301	Varat SRL (IT)	Process for producing biodiesel from vegetable oils. Process for producing biodiesel from vegetable oils comprising: - an initialization step; - A step of stripping the alcohol and a simultaneous step of primary transesterification at room temperature inside a first transesterification reactor RT1; - A step of secondary decantation; - A step of purification and storage of crude biodiesel; - A step of secondary transesterification at reaction temperature inside a second transesterification reactor RT2; and - A step of decantation, purification, and storage of crude biodiesel.
WO2017033188	Yeda Res & Dev (IL)	Algal oil and biofuel and methods of producing same. Methods of producing algal oil and algal biofuel are provided. Accordingly there is provided a method of producing oil, the method comprising infecting <i>Emiliana huxleyi</i> microalgae with a Coccolithovirus Eh V201; and extracting the oil from the microalgae 24-72 hours following the infecting. Also provided is a method of producing biofuel, the method comprising extracting oil from virus infected <i>Emiliana huxleyi</i> microalgae; and processing the oil by a reaction that splits the fatty acids chains of a triacylglycerol (TAG) comprised in the oil from its glycerin backbone. Also provided are oil, biofuel and cake from an <i>Emiliana huxleyi</i> microalgae and methods of producing same.

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VT BIOMASA

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