



BIOENERGÍA A PARTIR DE RESIDUOS GANADEROS

En las dos últimas décadas, los países desarrollados han ido cambiando su sistema de producción ganadera pasando de pequeñas empresas familiares poco intensificadas a una producción muy intensiva y concentrada en determinadas zonas. Como consecuencia de ello, la producción de residuos ganaderos ha llegado a tal punto que la Tierra no tiene suficiente capacidad para absorberlos de forma natural. Esto se ve agravado, además, por el incremento del uso de productos zoonosarios, derivados tanto de la mayor agrupación de animales como de la mejora en los requisitos y controles sanitarios de los animales antes de su llegada al consumidor. Por todo esto, en los últimos años se ha ido planteando la necesidad de una nueva planificación en la gestión de este tipo de residuos para eliminar el impacto que su exceso pueda originar. Esta nueva gestión deberá ir ligada a su aprovechamiento sostenible, bien como combustible biomásico o como abono orgánico.

Con el fin de vislumbrar cuál es la situación en Europa y distinguir las tecnologías objeto de mayor investigación actualmente y sus tendencias, se realizó un primer análisis de las publicaciones científicas de la base de datos ISI Web of Knowledge (ISI WoK) en el ámbito del aprovechamiento energético de residuos ganaderos.

En el mundo se han publicado más de 4000 artículos científicos en este campo, de modo que en el 40% participan instituciones europeas. En la Figura 1 se muestra la evolución temporal del número de artículos publicados por instituciones europeas, observándose que los primeros datan de comienzos de la década de los 80. Asimismo, puede apreciarse a través del número de publicaciones, el interés creciente suscitado en este campo en la última década.

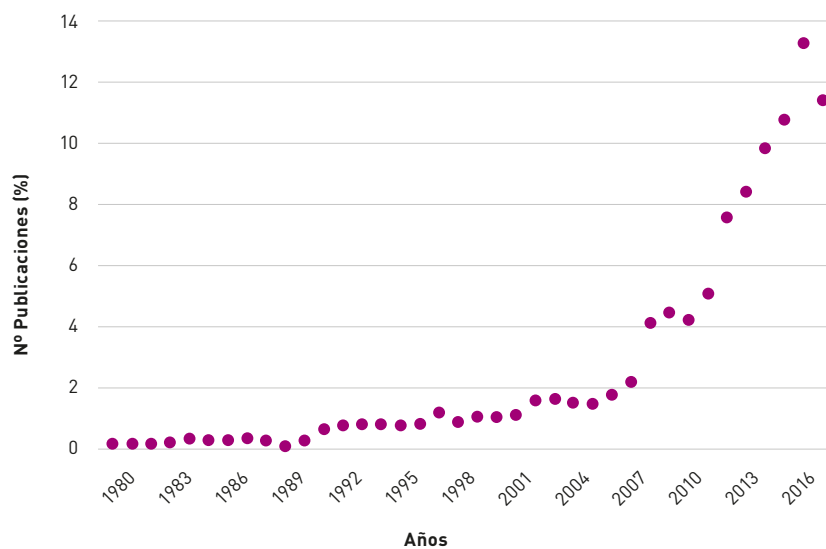


Figura 1. Evolución temporal del número de publicaciones científicas en Europa

Se han identificado 173 artículos publicados en 2017 pertenecientes a centros europeos. En la Figura 2 se representan los países líderes, figurando a la cabeza España. Tras España se sitúan Dinamarca e Italia. Las instituciones más representativas se recogen, asimismo, en la Figura 3. La que cuenta con mayor número de artículos es la Universidad de Aarhus (Dinamarca), seguida de la Universidad de Santiago de Compostela (España).

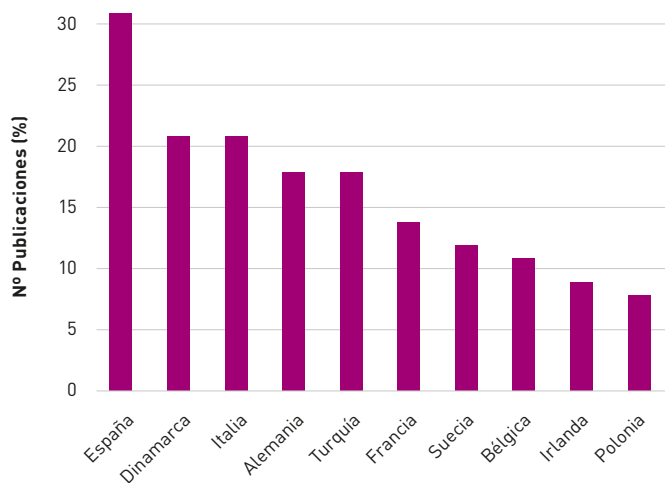


Figura 2. Países europeos líderes en 2017

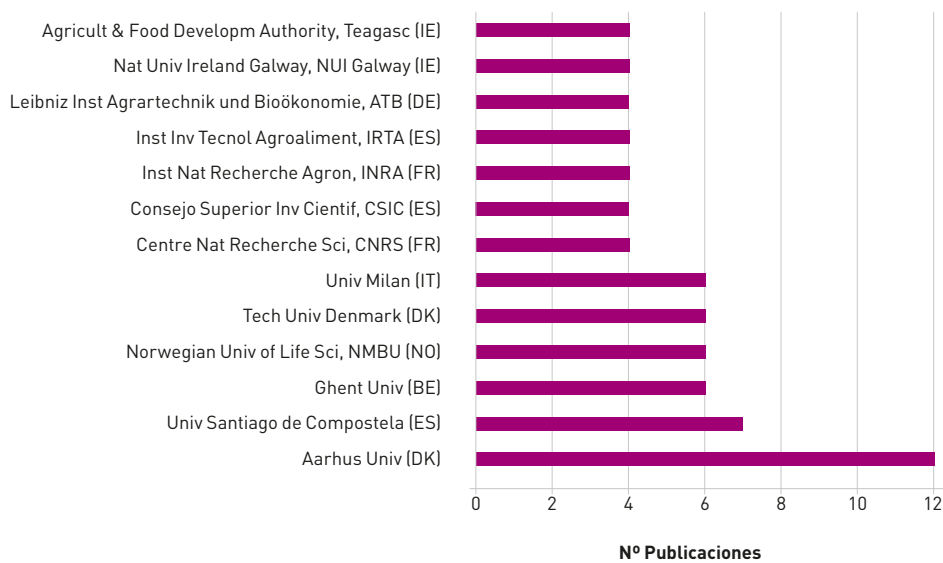


Figura 3. Instituciones europeas líderes en publicaciones en 2017

La Tabla 1 muestra las líneas principales de investigación de las instituciones más relevantes obtenidas a partir de las palabras clave asignadas por el autor a sus publicaciones. Cabe destacar que todos los centros señalados están implicados en el desarrollo de la tecnología de digestión anaeróbica de residuos ganaderos, concretamente en su codigestión con otros tipos de biomasa, como biomasa lignocelulósica o residuos de alimentos, que conducen a un aumento sustancial en la producción de metano y, en definitiva, en la rentabilidad global del proceso. Son numerosos los centros que abordan, además, la aplicación del digestato estabilizado, rico en potasio, fósforo y nitrógeno, como fertilizante. Asimismo, muchos estudian distintos tipos de pretratamiento de la alimentación, tales como el *ammonia stripping*, dirigidos a evitar la inhibición del proceso de digestión por exceso de amonio; así como el postratamiento de los efluentes líquidos mediante, por ejemplo, pilas de combustible microbianas, con el fin de obtener un líquido con la adecuada concentración de amonio que permita su aplicación como fertilizante. Algunas de las instituciones de la Tabla 1 se centran también en diferentes procesos de pirólisis dirigidos a la obtención de biocombustibles líquidos, así como de biochar estabilizados para ser utilizados en la eliminación de metales pesados en suelos y aguas contaminadas.

La Figura 4 supone un complemento de la Tabla 1, mostrando la distribución de publicaciones europeas de 2017 en función de la tecnología a la que se refieren. El 79% se dirigen al proceso de digestión anaeróbica, el 12% al de pirólisis y el 4% al de gasificación para obtener un gas combustible-syngas. Otras tecnologías objeto de estudio, aunque en menor medida, son la fermentación oscura y las pilas de combustible microbianas.

Centros	Palabras clave
Aarhus Univ (DK)	Anaerobic co-digestion, grass, cattle manure, poultry droppings; biogas, swine manure, recirculation, antibiotic removal; pig manure, alkali pretreatment, digestate stabilization, phosphate removal, ammonia recovery; microbial community analysis
Univ Santiago de Compostela (ES)	Anaerobic co-digestion, pig manure, food wastes, energy crops, phosphorus recovery, ammonia recovery, digestate stabilization Water heavy metals removal, chicken manure-derived biochar
Ghent Univ (BE)	Anaerobic co-digestion, swine manure, vegetables residues, cow dung, rice straw, phosphorus recovery, ammonia recovery, bio-based fertilizers
NMBU (NO)	Anaerobic co-digestion, cattle manure, food wastes, meadow grass, poultry droppings, microbial analysis, continuous stirred tank reactors; digestate soil application
Tech Univ Denmark (DK)	Anaerobic co-digestion, orange peel, cattle manure, seaweed; ammonia-tolerant methanogens; aqueous ammonia soaking pretreatment; mathematical modeling
Univ Milan (IT)	Anaerobic digestion, co-digestion, swine manure, dairy manure, energy crops, digestate soil application, ammonia removal, CO ₂ stripping, microbial load, pathogens
CNRS (FR)	Anaerobic digestion, mixing, numerical simulations, heavy metals fate; high solid anaerobic digestion, swine manure; cow manure, rheology
CSIC (ES)	Mesophilic anaerobic digestion, pig slurry, fruit and vegetable waste, Clostridium Microbial community structure, biochar, pig slurry, soil organic matter; analytical pyrolysis, thermal stability, poultry manure, freshwater algae
INRA (FR)	Dry anaerobic digestion, leach-bed reactor, leachate management, food waste, cattle manure, VFA extraction, VFA consumption; spent livestock bedding; near infrared spectroscopy, biochemical characterisation Poultry manure-derived biochar, soil amendment, environmental bioavailability
IRTA (ES)	Microbial fuel cell (MFC), anaerobic digestion, ammonia recovery, pig slurry, system stability; mesophilic codigestion, alkali pre-treatment, pig manure, wheat straw, methane yield
ATB (DE)	Ammonia removal, anaerobic digestion, biogas, livestock waste; anaerobic thermophilic digestion, poultry manure, organic fertilizer Animal manure hydrochars, hydrothermal carbonization, livestock waste, statistical model; removal of antimony (III) and cadmium
NUI Galway (IE)	Anaerobic codigestion, food waste, pig manure, Monte Carlo simulation, finance, substrate availability; pig manure, grass silage, pilot-scale evaluation, synergistic effects; pig manure, food waste, low hydraulic retention times
Teagasc (IE)	

Tabla 1. Líneas de investigación de las instituciones europeas líderes en 2017

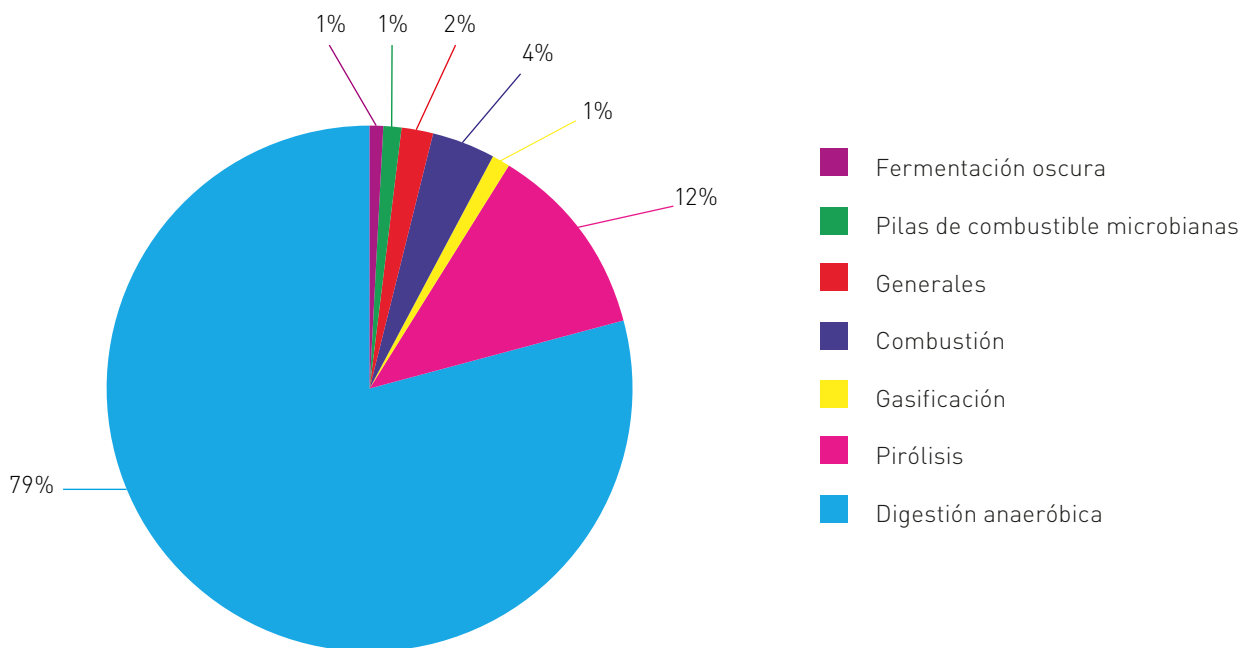


Figura 4. Distribución de las publicaciones de 2017 por tecnologías

FUENTES: Los residuos ganaderos – Agenex, Bioresource Technology 244 (2017) 816-823, Bioresource Technology 244 (2017) 509-516, Bioresource Technology 243 (2017) 1251-1256, Bioresource Technology 243 (2017) 836-845.

ANÁLISIS DE PATENTES

Durante el primer trimestre de 2018 se han identificado en la base de datos WPI (World Patent Index) 234 familias de patentes sobre tecnologías de conversión de la biomasa para la producción de energía, excluyendo las invenciones con ámbito de protección exclusivamente asiático. Cabe señalar que el 70.1% de las familias se refiere a tecnologías termoquímicas. El 27.8% y el 8.6% hacen referencia a tecnologías bioquímicas y químicas, respectivamente. La tecnología de pirólisis/gasificación es la que cuenta con mayor número de resultados, 36.8% del total, seguida de la de combustión, con el 35.0% (Tabla 2).

Tipos de tecnologías de conversión de la biomasa	Nº Familias
Tecnologías termoquímicas	164
Combustión directa	82
Gasificación/pirólisis	86
Tecnologías bioquímicas	65
Digestión anaeróbica	25
Fermentación de azúcares	41
Tecnologías químicas (transesterificación, Fischer-Tropsch, síntesis de metanol)	20
Nº TOTAL FAMILIAS DE PATENTES	234

Nota: Alguna invención puede incluirse en más de una tecnología

Tabla 2. Número de familias de patentes clasificados por tecnologías

En la Tabla 3 se muestran los países líderes en protección. En primer lugar se encuentran las solicitudes internacionales (PCT), con 92 documentos; en segundo lugar se encuentra EE.UU., con 63. En tercer lugar y a enorme distancia, se sitúa Alemania, con 16 referencias. En España, en el periodo analizado, se publicaron 3. 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	92
2	EE.UU. (US)	63
3	Alemania (DE)	16
4	Indonesia (ID)	13
5	Rusia (RU)	12
6	Polonia (PL)	11
7	EP	10
8	Brasil (BR)	9
	Francia (FR)	9
	Bélgica (BE)	5
9	Canadá (CA)	5
	México (MX)	5
10	Australia (AU)	4

Tabla 3. Ranking por países

	Tipos de Tecnología (Nº Documentos)		
	Termoquímicas	Bioquímicas	Químicas
PCT	63	33	4
EP	8	2	0
Alemania (DE)	12	6	0
Australia (AU)	0	3	1
Bélgica (BE)	5	0	0
Brasil (BR)	6	2	2
Canadá (CA)	5	0	0
EE.UU. (US)	50	15	4
Francia (FR)	4	3	2
Indonesia (ID)	3	3	7
México (MX)	1	3	1
Polonia (PL)	11	0	0
Rusia (RU)	10	1	1

Tabla 4. Ámbitos de protección más solicitados por tecnologías

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

TECNOLOGÍAS TERMOQUÍMICAS

Patentes

COMBUSTIÓN DIRECTA		
Nº Publicación	Solicitante (País)	Contenido técnico
US2018070772	Crystal Spring Colony Farms Ltd (CA)	Cooking grill using pellet fuel. A cooking grill includes a container defining a combustion area and a cooking surface over the combustion area. The grill features a pellet burner unit disposed within the container under the cooking surface and a pellet feeding device arranged to feed pellets into the burner unit. The burner unit comprises a trough into which the pellets are fed. The trough is mounted in a movable support which can be pulled out from within the container. The feeding device includes a removable cartridge for containing pellets and a receptacle for receiving the cartridge inserted thereon so that the cartridge supplies pellets for transfer to the pellet burner unit. In addition, a gas burner system is arranged in the container adjacent to the pellet burner unit so as to apply heat from the gas burner system to the cooking surface in addition to or as an alternative to the pellet burner unit.
WO2018041312	Novo Futura IVS (DK)	Disposable grill and method of manufacturing a disposable grill. The invention relates to a disposable grill comprising a base tray as an outer grill cover made in a flammable material, a fuel shaped in a combustible biomass material, and an insert structure made in a heat insulating material for holding said fuel and being partly or fully covered by said base tray, wherein at least one wall thickness of at least one location in said insert structure being defined by one or more characteristics of said fuel and said base tray. The invention also relates to a method of manufacturing a disposable grill.
WO2018036993	Tischendorf Dieter et al. (DE)	Fuels and ignition aids made of modified, renewable raw materials. The invention relates to a fuel which is made of a cellulose- or hemicellulose-containing material and from fats and/or oils from the secondary or cascade utilization or contains the same, wherein said fats and oils are obtained by treatment of waste and residual materials.
EP3287698	Faust APS (DK)	Biomass boiler and method of using a biomass boiler. Rasping device for use in a boiler using biomass fuel of the type using bales of compressed straw as biomass fuel, where said rasping device comprises one or more cutting or rasping teeth or knives, such that in use said cutting or rasping teeth or knives engage and disintegrate a surface of a bale, where said cutting or rasping teeth or knives are moveable.
RU177020	Svetlolor Llc (RU)	Combustion chamber for wood pellet based solid fuel. The proposed utility model relates to heat power engineering and concerns the combustion chamber of a solid fuel boiler, which mainly operates on biofuel in the form of pellets. The combustion chamber of the solid fuel boiler contains a secondary air supply pipe, a vertical screen made of two sealed metal cylinders, internal and external, a secondary air outlet nozzle, a radiator made in the form of a vertical metal cylinder positioned between the inner and outer cylinder of the vertical screen opposite the nozzles. It is new that the nozzles for secondary air discharge are made from above and below on the inner cylinder of the vertical screen, the nozzle axes for exhausting the secondary air of the upper row and the axis of the secondary-air exhaust nozzles of the lower row are made pairwise intersecting. The technical result of using the utility model is to reduce the required amount of secondary air, increase the efficiency of the boiler, increase the battery life of the boiler.
US2018051886	Myers Taylor Macks et al. (US)	Apparatus and method for burning solid fuel. A solid fuel burning device has at least one burn chamber wall, a burn chamber base, and an interior burn chamber. The burn chamber base is capable of supporting a combustible solid fuel thereon. At least one of the burn chamber walls is radially offset with respect to another of the burn chamber walls. At least two longitudinally extending air inlets are formed in the space between a first longitudinal edge of at least one of the burn chamber walls and a second longitudinal edge of another burn chamber wall. Each of the longitudinally extending air inlets tangentially directs an entry of air into the interior burn chamber to induce an interior swirl of air in the interior burn chamber. The interior swirl of air in the interior burn chamber causes a flame of a combusting solid fuel to swirl in the interior burn chamber.

Nº Publicación	Solicitante (País)	Contenido técnico
EP3281571	Ompagrill SRL (IT)	Multifunctional barbecue. A multifunctional barbecue, comprising: - a heat diffusion vessel with means for resting on the ground, - an extractable combustion container for pellets, which is inserted reversibly, with corresponding supporting means, in a position below the vessel and is open onto the vessel, - a tubular protective body for the extractable combustion container, shaped so as to define, with the combustion container, a thermal insulation gap.
WO2018024796	Shell Int Research (NL) et al.	Improved biomass conversion process. The present invention provides a process for producing liquid hydrocarbon products from a feedstock comprising at least one of a solid biomass-containing feedstock and a solid biomass-derived feedstock and in the range of from 50 to 15000 ppmw of chlorides, said process comprising the steps of: a) incorporating a chloride trap material into said feedstock to provide a combined feedstock/chloride trap material; b) densifying the combined feedstock/chloride trap material to form densified feed in the form of pellets or briquettes; c) contacting said densified feed with a hydrolysis catalyst composition and molecular hydrogen in a 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 7.50 MPa to produce a product stream comprising a deoxygenated hydrocarbon product, H ₂ O, H ₂ , CO ₂ , CO, C ₁ - C ₃ gases, char and catalyst fines; and d) removing all or a portion of said char and catalyst fines from said product stream.
DE202017006213	Volk Michael (DE)	Ignition tool for wood and coal stoves. A starting aid for wood and coal stoves, wherein: the container with a side wall and a bottom for receiving and burning the wood pellets consists of a perforated stainless steel sheet of the material with the material number 1.4301 with a wall thickness of at least 1.4 mm and a maximum of 3 mm, And in the stainless steel sheet in the bottom and in the side wall a plurality of openings is provided.
US2018031247	Hill Richard L et al. (US)	Pellet stove. A pellet stove includes a hopper for storing pellets, a basket for receiving the pellets by gravity, a duct for conveying combustion air to the basket, and a conduit for conducting heated air away from the basket. The position of the basket is adjustable, such as by raising and lowering it, or by rotating it, so as to control the number of pellets in the area of most intense combustion. One or more burn plates, positioned below the basket, provide platforms on which pellets falling through the basket can burn down to a smaller size. The pellet stove requires no external source of power. The stove so constructed enables quiet, efficient and clean burning of the pellets.
RO132355	Horațiu Negruțiu (RO)	Fireplace inserted in puffer or hearth directly or indirectly built in the puffer, using wood or pellets as a fuel, hereinafter named energy box. The invention relates to a fireplace inserted in the puffer or hearth directly or indirectly built in the puffer, using wood or pellets as a fuel, hereinafter named energy box. According to the invention, the fireplace carries out a heat storage from multiple sources, to be used in heating and hot domestic water preparation and limits the water temperature for the final consumer, the energy box being a hybrid energy system consisting of a cylindrical tank named puffer wherein a hearth named fireplace is inserted and assembled by welding, and this system is a thermo-hydraulic model, equipped with solar coil, stainless steel coil with flange for household hot water, worm pellet-burner and controller, solar controller and unit, pumps, hydraulic connections with pipes and bends, switching and mixing valve and expansion vessels, a solar one, a water one and a thermal one.
WO2018002875	ETI S N C (IT)	Thermal energy distribution kit or system for the production of domestic hot water and hot water for heating purposes and plant employing said kit. The invention is an operating logic that, through the use of already known elements connected according to the diagram enclosed hereto, resolves a series of anomalous operating situations known to the experts in the art, thus optimizing the yield of biomass heat generators (water-powered). In particular, the biomass generator is capable of providing performance levels that can be compared to those of a traditional generator, using a small-sized storage system. This is possible thanks to the introduction of the mixing valve (V4) in the return circuit of the biomass generator, which will keep conveying cold water into the generator independently of the need for hot water, thus making the generator work longer at minimum power avoiding repeated switching cycles or overheating.

Nº Publicación	Solicitante (País)	Contenido técnico
EP3267104	Steinmüller Eng GmbH (DE)	Burner and method for optimised combustion of coarse particulate fuels, particularly biomass. Particulate fuel burner particularly suitable for burning biomass fuels, comprising: - a primary pipe; - A in the primary tube arranged core tube; - wherein the primary tube and the core tube form a primary tube gap and wherein the primary tube gap for ejecting a fluid mixture of a particulate fuel and a carrier gas is formed; - A primary tube concentrically surrounding the first secondary tube; optionally a second secondary pipe concentrically surrounding the first secondary pipe and optionally one or more further secondary pipes concentrically surrounding the respective inner pipe; - A plurality of flame stabilizers projecting radially at the outlet opening of the primary pipe gap in the cross section of the primary pipe gap, wherein the flame stabilizers define free flow paths whose axes between each two adjacent flame stabilizers parallel to the longitudinal direction of the primary pipe run, wherein within the primary tube gap upstream of the flame stabilizers one or more deflecting bodies is arranged or are such that the respective deflecting body intersects the axis of a free flow path.
EP3263989	Poujoulat (FR)	Method and system for estimating wood consumption for energy and/or the thermal demand of an individual wood-heater facility provided in a building. The invention relates to a method for estimating the consumption of wood energy and/or the thermal draft of an individual heating system to the wood equipping a building. This method comprises at least the following steps: a) at least one step of measuring temperatures, at each combustion cycle of wood energy within a furnace of a heater of said individual installation for heating wood, namely at least the temperature of the products of combustion in an exhaust duct of said individual wood heating system, and b) a step of calculating the estimated consumption wood energy and/or estimated thermal draft, taking into account at least said temperature of the combustion products.
EP3263675	Total Marketing Services (FR)	Biomass fuel composition and method for preparing and combusting the same. The present invention relates to a fuel composition derived from biomass, in particular liquid biomass, and a process for preparing this fuel composition. The fuel composition comprises: an acidic oil resulting from the acidification of a neutralization paste obtained by a refining process, in particular a saponification process, of one or more oils chosen from a vegetable oil and an animal oil, and a composition based on tall oil pitch. This combustible composition is particularly suitable for being burned in industrial combustion plants.

PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2018047200	Lali Arvind Mallinath (IN)	A process for generation of biogas from organic matter via its liquefaction to liquid biocrude. The present invention relates to an anaerobic digestion (AD) process for generation of biogas in near theoretical yields and enhanced productivities from liquid biocrude obtained from a continuous, high yield process operating under moderate temperature and pressure for liquefaction of organic matter. The basis of the invention is the surprisingly excellent amenability of liquid biocrude to anaerobic digestion, and hence the invention imparts great ease and high efficiency to the overall process despite the variable quality of solid organic matter. AD of liquid biocrude results in more than 90% COD reduction with biogas yield greater than 90% containing at least 55% (v/v) methane at OLRs more than 15 g COD/1, day in less than 24 h. The biogas produced can be used for direct replacement of petro-CNG as transport fuel or as power for electricity generation.
WO2018044252	Stryzhak Sergii (UA)	Method of conversion of municipal solid and other carbon-containing waste into synthesis gas and the equipment based on this method. The invention relates to a method and a device of thermochemical conversion of municipal solid waste and other carbon-rich feedstock with high content of tars into synthesis gas. Conversion occurs in a two-stage process of pyrolysis (zones 1-3, 7) and subsequent updraft gasification (zones 4-6, 8-10) of fluidized bed of carbonaceous feedstock residue in a slow air-and-gas flow. Zones 1-3 are zones of low-temperature processing of feedstock and located in the pyrolysis part of device. Zones 4-10 are zones of high-temperature processing of feedstock and located in the gasification part of device. The pyrolysis part of device consists of feedstock loading device (1), rotary kiln of indirect heating (2), device for discharging dust gas residue (3). The gasification part of device consists of gasifier (5), a unit for feeding carbonaceous feedstock residue in gasifier (4) and a unit for unloading of the slag (6). The invention also uses synthesis gas in the ways presented herein.
RU2644908	Federalnoe Gosudarstvennoe Byudzhetnoe Obrazovatelnoe Uchrezhdenie Vysshego Obrazovaniya Michurinski (RU)	Method of low-temperature pyrolysis of granulated biomass of vegetable or animal origin. Method is carried out using a pyrolysis reactor having vertically arranged trays including feeding biomass through the upper feed inlet of the reactor and subsequent cascading the biomass movement down through the trays by moving through the slots in each of the trays and entering the biomass onto the underlying tray with unloading the thermally treated biomass through the lower discharge outlet from the reactor. While heating, drying and low-temperature pyrolysis of the biomass are carried out with the gas pyrolysis products allocated to each tray of the biomass when it is in contact with the side walls and bottom of the tray, heated by the high-temperature coolant. In addition, the lower tray is not heated by the high-temperature coolant, and direct flow of cooling water is carried out through a nozzle into the inner volume of the lower tray into the biomass layer on the tray, then the chilled biomass is discharged. EFFECT: increasing the reliability of the equipment operation. 1 dwg, 1 ex
WO2018042345	Univ Nacional de Colombia (CO)	Production system and process for obtaining bio-oil from biomass. The invention relates to a system for generating bio-oil from biomass and a process for producing bio-oil from biomass. The system for producing bio-oil from biomass comprises: a mechanism for the continuous supply of biomass; a pyrolyser having a biomass inlet connected to the mechanism for the continuous supply of biomass, and having a mesh; a mechanism for separating solids connected to the pyrolyser; and a condenser connected to the mechanism for separating solids. The process for the production of bio-oil from biomass comprises the following steps: a) continuously supplying biomass to a pyrolyser; b) pyrolysing the biomass at a heating rate of greater than 1000°C/s, to a temperature between 300°C and 750°C, and with a dwell time of less than 2 seconds, in the pyrolyser; c) separating particulate material present in the gases obtained via pyrolysis in step b), in a mechanism for separating solids; and d) condensing the gases obtained via pyrolysis that are condensable to a temperature between -30°C and 0°C, in a condenser.

Nº Publicación	Solicitante (País)	Contenido técnico
WO2018044251	Strizhak Sergii Yu (UA)	Method of conversion of municipal solid waste and other carbon-containing feedstock with high content of tars into synthesis gas and the equipment used in this method. The invention relates to a method and a device for thermochemical conversion of municipal solid waste and other carbon-rich feedstock with high content of tars into synthesis gas. Conversion occurs in a two-stage process of pyrolysis (zone 1-4) and subsequent downdraft gasification (zone 5-7) of viscous bed of carbonaceous feedstock residue in a slow air-and-gas flow. Viscous bed is a heated layer of pulverized friable mass of carbonaceous feedstock residue obtained in the process of high-temperature pyrolysis and conveyed into combustion and gasification zone 5 in the form of densified mass. The device consists of a feedstock loading device (1), a rotary kiln of indirect heating (2), a device for discharging dust gas residue (3), a unit for feeding carbonaceous feedstock residue (4), a gasifier (5) and a unit for unloading of the slag (6). The invention also describes use of synthesis gas in the ways presented herein.
US2018065101	Ohio State Innovation Foundation (US)	Systems and methods for partial or complete oxidation of fuels. A system used for converting multiple fuel feedstocks may include three reactors. The reactor system combination can be so chosen that one of the reactors completely or partially converts the fuel while the other generates the gaseous product required by utilizing the gaseous product from the second reactor. The metal-oxide composition and the reactor flow-patterns can be manipulated to provide the desired product. A method for optimizing the system efficiency where a pressurized gaseous fuel or a pressurized utility is used for applications downstream can be used to any system processing fuels and metal-oxide.
PL414823	Roszkowski Stanisław (PL)	Device for gassing municipal plastic wastes. The device has a pyrolysis reactor whose lower part is provided with a surrounding aeration collector and surrounding collector. An upper part of the pyrolysis reactor is provided with a gas suction collector. An upper part of the pyrolysis reactor is connected with heat absorption increased exchanger. A lower part of the pyrolysis reactor is connected to a gas collection collector. A specific chamber of the pyrolysis reactor is provided with a charging hopper. The charging hopper is connected with a dosimeter and a conveyor. The conveyor is arranged with a geared motor.
CA2937445	Glock Gaston (AT)	Wood gasification. The invention relates to an apparatus and a method for gasifying wood, having a gas generator (1), to which the material for gasification and oxygen, usually in the form of air, are supplied, the gasification taking place in a fixed bed reactor. The product gas is drawn off via a product gas line (6) and introduced into a hot gas filter (2), where a filter, preferably provided with filter candles (7), removes solids such as particles not yet gasified, ash and foreign bodies, while the clean gas passes through and is taken off via a clean gas line (8). An outlet (10) is provided in the bottom region of the hot gas filter (2) to take off the residual solids. In order to increase the yield, the invention provides for the hot gas filter (2) to be supplied, in its middle height region, between the filter bottom (13) and the outlet (10), through a line (12), with oxygen, preferably in the form of air.
WO2018037481	Japan Blue Energy Co Ltd et al. (JP)	Method for recovering hydrogen from biomass pyrolysis gas. The present invention provides a method for recovering hydrogen which not only is capable of efficiently recovering high concentration hydrogen gas by adsorbing and removing hydrocarbon gas such as carbon dioxide from biomass pyrolysis gas under a relatively low pressure but is also capable of storing the recovered high concentration hydrogen gas, preferably, in a cartridge type container that can be used as is as a hydrogen storing container for an apparatus equipped with a fuel cell. The method for recovering hydrogen includes a first purifying stage of purifying biomass pyrolysis gas and a second purifying stage of purifying the obtained purified gas under a pressure equal to or less than the pressure in the first purifying stage to recover gas that contains hydrogen, and further includes a hydrogen storing stage of feeding the gas containing hydrogen recovered in the second purifying stage into the predetermined container filled with a hydrogen storage alloy and storing high purity hydrogen.

Nº Publicación	Solicitante (País)	Contenido técnico
US2018056262	Amerge Llc (US)	Chain drag system for treatment of carbaneous waste feedstock and method for the use thereof. A drag chain carbonizer is provided with a system and methods for anaerobic thermal conversion processing to convert waste into various solid carbonized products and varied further co-products. The drag-chain carbonizer includes an adjustable bed depth mechanism, a heating mechanism, a pressure management mechanism, an atmospheric management mechanism, and a chain tensioning mechanism containing at least one position sensor for communication of an actuator position to at least one programmable logic controller (PLC). Carbonaceous waste is transformed into useful co-products that can be re-introduced into the stream of commerce at various economically advantageous points. Depending upon the input materials and the parameters selected to process the waste, including real time economic and other market parameters, the system adjusts co-products output to reflect changing market conditions.
US2018045407	Univ Texas (US)	Systems and methods for converting biomass to biocrude via hydrothermal liquefaction. Systems and processes of providing novel thermal energy sources for hydrothermal liquefaction (HTL) reactors are described herein. According to various implementations, the systems and processes use concentrated solar thermal energy from a focused high-energy beam to provide sufficient energy for driving the HTL biomass-to-biocrude process. In addition, other implementations convert biowaste, such as municipal biosolids and grease and food waste, to biocrude using anaerobic digesters, and a portion of the biogas generated by the digesters is used to produce the thermal and/or electrical energy used in the HTL reactor for the biomass-to-biocrude process. Furthermore, alternative implementations may include a hybrid system that uses biogas and solar radiation to provide sufficient thermal energy for the HTL reactor.
WO2018025227	Reliance Industries Ltd (IN)	A process and a system for producing synthesis gas. The present disclosure relates to a process and a system for producing synthesis gas. The carbonaceous feedstock is gasified, in the presence of at least one of oxygen and steam, in a first reactor to obtain a gaseous mixture comprising H ₂ , CO, CH ₄ , CO ₂ , H ₂ O, tar and char. The gaseous mixture is treated in a second reactor, in the presence of a catalyst, to obtain synthesis gas. The system comprises a first reactor, a connecting conduit, a second reactor, at least one cyclone separator, at least one heat exchanger and at least one synthesis gas filter unit. The process and the system of the present disclosure are capable of producing synthesis gas with comparatively higher conversion of the unreacted char.
WO2018026388	Greyrock Energy Inc (US)	Catalysts, related methods and reaction products. The present invention generally relates to improved catalysts that provide for reduced product contaminants, related methods and improved reaction products. It more specifically relates to improved direct fuel production and redox catalysts that provide for reduced levels of certain oxygenated contaminants, methods related to the use of those catalysts, and hydrocarbon fuel or fuel-related products that have improved characteristics. In one aspect, the present invention is directed to a method of converting one or more carbon-containing feedstocks into one or more hydrocarbon liquid fuels. The method includes the steps of: converting the one or more carbon-containing feedstocks into syngas; and, converting the syngas to one or more hydrocarbons (including liquid fuels) and a water fraction. The water fraction comprises less than 500 ppm of one or more carboxylic acids.

Nº Publicación	Solicitante (País)	Contenido técnico
WO2018025216	Mini Leandro et al. (IT)	Pyrogasification unit and process. The invention comprises a process for the pyrogasification of solid plant biomass which resolves the problem of the presence of tar in the syngas produced within such process to the point that it can then be passed to an endothermic engine without causing its premature breakdown. In order to achieve this process a new type of pyrogasifier unit comprising a reactor of frustoconical shape with internal walls of refractory materials provided with a first upward opening for the entry of gasifying agent and a second downward opening for exit of the syngas has been produced. The upper opening is the only possible entry for the gasifying agent and at the same time it is crucial to prevent any further ingress of air from the walls of the truncated cone, in addition to this such opening must be equal to the entire upper surface area of the reactor, therefore not an inlet nozzle or window but a proper open vessel, in order to ensure that the gasifying agent interacts uniformly and activates the entire upper surface area of the reactor to then propagate continuously downwards. The pyrogasification process propagates from the top to bottom in a gradual, progressive and geometrically self-regulating manner. The syngas produced thus passes through the full height of the reactor being exposed to a prolonged cracking action giving rise to a product with a low tar content. It is also an object of the invention a method of using the pyrogasification unit according to the present invention.
WO2018018615	Univ Tongji (CN)	Method and system for preparing fuel gas by utilizing organic waste with high water content. Provided are a method and a system for preparing a fuel gas by utilizing organic waste with a high water content. The method comprises the following steps: 1) providing organic waste with a high water content; 2) using the organic waste with a high water content as a reactant to perform a hydrothermal reaction, so as to obtain a hydrothermal reaction product; 3) making the hydrothermal reaction product generate steam, and separating a solid product and an oily liquid product from the hydrothermal reaction product; 4) using the solid product, the oily liquid product and the steam as reactants to perform a gasification reaction, so as to obtain a gasification reaction product; and 5) purifying the gasification reaction product, so as to obtain a clean fuel gas. Also provided is a system for preparing a fuel gas. A clean fuel gas can be prepared from organic waste with a water content of 60% or more by means of the method.
WO2018030702	Univ of Seoul Industry Cooperation Foundation (KR)	Dual biomass gasification reactor equipped with dispersion plate for reducing flow rate of fluidized bed medium and gasification apparatus comprising same. The present invention relates to a dual biomass gasification reactor equipped with a dispersion plate for reducing a flow rate of a fluidized bed medium and a gasification apparatus comprising the same. The dual biomass gasification reactor equipped with a dispersion plate for reducing a flow rate of a fluidized bed medium comprises: a first reactor for gasifying waste fed thereto; and a second reactor installed to communicate with the first reactor and filled with a predetermined amount of carbon adsorbent to reduce a tar content in a product gas produced in the first reactor, and to increase hydrogen production, and to supply a resulting product gas to a subsequent process, wherein the first reactor helps the waste combust and gasify, thereby producing combustible gas and bio-char, and wherein the dispersion plate is in a cylindrical form with a closed top surface and an open bottom surface and has a plurality of holes formed in a circumferential surface thereof. The dispersion plate installed on a communicating portion of the first and the second reactor prevents the powdery carbon adsorbent filled in the reactor from being blown out even when the flow rate of the fluidized bed medium is increased, so that the product gas produced through the reaction has not only significantly reduced tar content but also a remarkably increased hydrogen concentration. Therefore, a high-calorific gas can be manufactured.

Nº Publicación	Solicitante (País)	Contenido técnico
WO2018015472	Shell Int Research (NL)	Process for the conversion of biomass-derived vapours and process for the conversion of a solid biomass material. This invention relates to a process for the conversion of biomass-derived vapours, comprising: - a catalytic step, wherein at least part of the biomass-derived vapours are contacted with a catalyst at a temperature in the range from equal to or more than 350°C to equal to or less than 550°C, thereby producing a product mixture; and - a condensing step, wherein part of the product mixture is condensed in one or more condensers, thereby forming a condensed product fraction and a gaseous product fraction; wherein at least part of the gaseous product fraction is recycled to the catalytic step and combined with the biomass-derived vapours. The present invention also relates a process for the conversion of a solid biomass material, comprising: - a pyrolysis step, wherein at least part of the solid biomass material is pyrolysed, thereby producing biomass-derived vapours; - a catalytic step, wherein at least part of the biomass-derived vapours are contacted with a catalyst at a temperature in the range from equal to or more than 350°C to equal to or less than 550°C, thereby producing a product mixture; and - a condensing step, wherein part of the product mixture is condensed in one or more condensers, thereby forming a condensed product fraction and a gaseous product fraction; wherein at least part of the gaseous product fraction is recycled to the catalytic step and combined with the biomass-derived vapours.
US2018023003	Battelle Memorial Institute (US)	Combined Hydrothermal Liquefaction and Catalytic Hydrothermal Gasification System and Process for Conversion of Biomass Feedstocks. A combined hydrothermal liquefaction (HTL) and catalytic hydrothermal gasification (CHG) system and process are described that convert various biomass-containing sources into separable bio-oils and aqueous effluents that contain residual organics. Bio-oils may be converted to useful bio-based fuels and other chemical feedstocks. Residual organics in HTL aqueous effluents may be gasified and converted into medium-BTU product gases and directly used for process heating or to provide energy.
GB2553919	Anthony Phan (CN)	Biomass treatment process and apparatus. A process and apparatus are provided for treatment of particulate biomass. The present process comprises a densification stage, a first treatment stage, a second treatment stage and a cooling stage; the present apparatus comprises a double-walled thermochemical treatment chamber which is a two-stage compact moving bed type including two compartments for pre-torrefaction and torrefaction (mild pyrolysis) and having a star or spider or ring form hot gas distribution system equipped with at least one hot gas input and at least one hot gas output for each compartment, and at least one particulate biomass inlet and at least one particulate biomass outlet. The object is to reduce greenhouse gas (GHG) emissions.
US2018002624	Ecogenus Llc (US)	Solid fuel composition formed from mixed solid waste. Systems and methods of producing a solid fuel composition are disclosed. In particular, systems and methods for producing a solid fuel composition by heating and mixing a solid waste mixture to a maximum temperature sufficient to melt the mixed plastics within the solid waste mixture is disclosed.

TECNOLOGÍAS BIOQUÍMICAS

Patentes

DIGESTIÓN ANAERÓBICA		
Nº Publicación	Solicitante (País)	Contenido técnico
US2018051239	Kiwi Green Tech Llc (US)	Method and structure for comprehensive utilization of co-products of alcohol production from grains. A method is provided for treating distiller's grains with solubles (DGS) to produce one or more byproducts. The method includes separating the DGS into a low protein mixture and a high protein mixture. The method includes generating, from the low protein mixture, a biogas by an anaerobic digestion process. The method includes generating, from the high protein mixture, at least one of a vegetable oil from a vegetable oil separation process, a high protein animal feed from a separation process and a microalgae biomass material from a microalgae production process.
FR3055229	Tryon (FR)	Installation for local treatment of organic waste, processing method thereof and method of maintaining the installation. The invention relates to a plant for local treatment of organic waste comprising a transportable container which contains a hygiene tank, first heating means for heating the waste to be treated contained in the tank of sanitizing for hygienic purposes, a digestion vessel in fluid communication with the sanitizing tank, containing microorganisms and for receiving the sanitized waste, second heating means for feeding and maintain in mesophilic condition the contents of the digestion vessel, the facility further comprising a waste storage assembly comprising at least one storage tank methanized waste in fluid communication with the tank of digestion, the storage assembly being configured to have a methanized waste storage capacity at least equal to the volume of the digestion vessel.
US2018057381	Hansen Conly L et al. (US)	Induced sludge bed anaerobic reactor. An induced sludge bed anaerobic reactor includes a vessel in which a septum is positioned to maintain solids in wastewater being treated toward a lower portion of the reactor. The septum is configured to prevent or minimize rising bacteria from exiting the vessel and to minimize clogging of the vessel. A first example septum is disclosed that is based on a linear vane design. A second example septum is disclosed that is based on a concentric vane design. A third example septum is disclosed that is based on a radial vane design that may include one or more sections. Further, septums may be layered one atop another to further minimize rising bacteria from exiting the vessel and to further minimize clogging of the vessel. Finally, a septum is attached to the inside of the vessel so as to allow it to move allowing any clogging waste floating under the septum to exit the vessel.
WO2018012983	Zeg Power AS (NO)	Method and device for biogas upgrading and hydrogen production from anaerobic fermentation of biological material. Method and device for biogas upgrading and hydrogen production from anaerobic fermentation of biological material under production of energy rich gases selected among methane and hydrogen or a combination thereof. The method comprises addition of hydrogen gas to a fermentation step to enhance the methane: CO ₂ ratio in the raw biogas produced. At least part of the raw biogas is subjected to a step of sorption enhanced reforming without prior separation of CO ₂ , using CaO as an adsorbent to capture CO ₂ from the raw biogas as well as CO ₂ released in the reforming reaction. CaO is regenerated in an endothermic reaction using heat at least partially provided, directly or indirectly, by the bio-gas to be upgraded, thereby producing substantially pure hydrogen and substantially pure CO ₂ .
WO2018010741	Salvetzki Ralf (DE)	Process for the biological generation of methane. The invention relates to a process for the biological generation of methane (CH ₄), which process is firstly environmentally friendly and inexpensive, and secondly avoids the use of fossil reserves. The process is divided into two steps, wherein first hydrogen (H ₂) and oxygen (O ₂) are generated from water (H ₂ O) by peptides that have hydrogenase activity. In the second step, methane (CH ₄) is isolated by methanogenesis bacteria from the hydrogen (H ₂) which is generated and from carbon dioxide (CO ₂). To increase the yield of the process, interfering oxygen (O ₂) can be bound in the hydrogenesis reaction mixture and/or in the methanogenesis bacteria.

Nº Publicación	Solicitante (País)	Contenido técnico
FR3053698	Incorporateur -Biogaz Com SAS (FR)	Device for preparation of biomass intended for methanisation. Most current installations are equipped with detanglers and / or grinders that do not guarantee the homogenization or preparation of the material and even less the good management of foreign bodies. The author of the present invention imagined to report to existing facilities an autonomous material integrator, in charge of treating waste prior to methanation, to make them more easily assimilated by digesters and optimize the results. It consists of a main box comprising and bringing together all the technical equipment necessary for treating the substrate from solid and liquid waste, in particular an "induction tank", for the introduction of solid waste, a effluent feed, means for mixing and disentangling solid waste mixer-disentangler, grinding and pumping means mobile crusher, means for recovering undesirable elements recuperator, a transfer conduit and a storage tank, the weight of the waste before and after treatment being controlled by a controller-weigher and all operations being managed at from a control zone.
US2018002207	Anaergia Inc (CA)	Solid waste processing with diversion of cellulosic waste. Waste, such as municipal solid waste (MSW), is separated into a wet fraction and rejects. For example, the waste may be separated in a press. A cellulosic fraction is separated from the rejects. In a wet method the rejects are treated in a pulper to extract the cellulosic fraction. In a dry method, the rejects are treated with an optical sorter. The cellulosic fraction is treated in an anaerobic digester, optionally with the wet fraction.
WO2017216720	Geo Environmental Energy Tech SRL (IT)	Process for treating and generating energy from biomasses. The present invention relates to a process for the treating and generating energy from biomass and a plant where the process is implemented, said process comprising the steps of (i) providing a biomass, and characterized by comprising the steps of: (ii) diluting the biomass with a thinner up to a volatile solids content comprised between 0.5% and 1% of the volume of said biomass; (iii) alkalizing the biomass of item ii with a basic solution, up to a pH comprised between 11.0 and 13.0, wherein said biomass of item ii and said basic solution are in a weight ratio comprised between 1 :20 and 1 :80; (iv) hydrolysing the alkalisied biomass of item iii, for a time comprised between 30 and 90 minutes, at a temperature comprised between 55°C and 80°C, thereby obtaining a hydrolysed biomass; (v) neutralising the hydrolysed biomass of item iv, through diffusion of CO ₂ from a biogas produced by anaerobic digestion, thereby obtaining a hydrolysed and neutralised sludge; (vi) performing anaerobic digestion, through a first anaerobic digester, of said hydrolysed and neutralised sludge, thereby obtaining a biogas, a first digestate, an anaerobic sludge.
WO2017212403	Univ Nacional de Colombia (CO)	Method for producing hydrogen. The invention relates to a method for producing hydrogen by fermenting a substrate obtained from organic waste, performed in a closed environment, without the supply of oxygen and in the absence of light. The method comprises: preparation of the complex substrate; an acidification step under anaerobic conditions and at ambient temperature; and, subsequently, the gradual increase of the pH of the system so as to obtain hydrogen.
RO132199	Inst Național De Cercetare-Dezvoltare Pentru Ing Electrică Icp-e-Ca (RO)	Biomass stimulation process and biogas producing plant. The invention relates to a process and a plant for biogas production. According to the invention, the process consists in applying a sinusoidal electric field in the frequency range of 0.5...200 Hz, depending on the fermented starting material, resulting in biogas at a CH ₄ :CO ₂ volumetric ratio in the range of 2.3...19. The plant, as claimed by the invention, includes a parallelepipedal fermentation enclosure made of epoxy resin reinforced with glass fibres, the walls having, two by two, a polarization electrode which is electrically connected to the connecting terminals of a controlled-frequency generator, some baffle plates being provided between the two walls and, for controlling the mass transport between the supply and discharge holes, respectively, the enclosure being provided with three manholes and a valve connection for biogas discharge.

FERMENTACIÓN DE AZÚCARES

Nº Publicación	Solicitante (País)	Contenido técnico
AU2018200353	Xyleco INC (US)	Processing Biomass. Feedstocks, obtained at least in part from a plant material that has been modified with respect to its wild type, are processed to produce useful intermediates and products, such as energy, fuels, foods or materials. For example, systems are described that can treat such feedstock 5 materials, e.g., to reduce the recalcitrance of the feedstock, and use the treated feedstock materials to produce an intermediate or product, e.g., by saccharification and/or fermentation.
AU2017272176	Xyleco INC (US)	Cellulosic and lignocellulosic structural materials and methods and systems for manufacturing such materials by irradiation. Biomass (e.g. plant biomass, animal biomass, and municipal waste biomass) is 10 processed to produce useful products, such as fuels. For example, systems can use feedstock materials, such as cellulosic and/or lignocellulosic materials and/or starchy or sugary materials, to produce ethanol and/or butanol, e.g. by fermentation.
AU2017272287	Danisco US INC (US)	Novel glycosyl hydrolase enzymes and uses thereof. The present disclosure is generally directed to glycosyl hydrolase enzymes, compositions comprising such enzymes, and methods of using the enzymes and compositions, for example for the saccharification of cellulosic and hemicellulosic materials into sugars. WO 2011/038019 PCT/US2010/049849 Cellulase Activity Assay 0.7% PASC, 500C, 2 Hours $c = 0.20$ $y = 0.0272x + 0.0146$ 0.10R2 = 0.9955 GC220 (mg Protein/G PASC) FG. 2%5 AfuXyn5
US2018030491	Syngenta Participations AG (CH)	Methods for starch hydrolysis. The presently disclosed subject matter provides a process for starch liquefaction using at least two classes of α -amylase enzymes, wherein the starch hydrolysis pattern from at least two of these classes is different. At least one class of enzyme is provided to the liquefaction process in the form of transgenic plant material expressing at least one class of α -amylase enzyme or is provided in the form of a purified or partially-purified α -amylase enzyme preparation. The second or subsequent class(es) of α -amylase enzymes may be provided in the form of additional transgenic plant material expressing the second or subsequent class(es), or may be provided in the form of a second or subsequent purified or partially-purified α -amylase enzyme preparation.
WO2018013791	Wisconsin Alumni Res Found (US)	Use of bacteriocin-producing ethanologens in biofuel production. An ethanologen for producing biofuel from one or more carbohydrates and reducing lactate and acetate production in a biofuel manufacturing process. The ethanologen is made by introducing into the ethanologen one or more exogenous genes required for production of a bacteriocin. The resulting ethanologen reduces lactate and acetate production by contaminant lactic acid bacteria by expression of the bacteriocin during the biofuel manufacturing process. Certain resulting ethanologens ferment sugars not naturally or not preferentially utilized by <i>Saccharomyces cerevisiae</i> during the manufacturing process.
US2018014546	Summer Elizabeth J et al. (US)	Broad Spectrum Bacteriocin for Control of Unwanted Bacteria. A composition containing a newly identified bacteriocin produced by a <i>Lactobacillus plantarum</i> strain, isolated from natural corn mash used in commercial fermentation process for production of ethanol. The bacteriocin composition is effective in broad range killing against the vast majority of the lactic acid bacteria (LAB) isolates in ethanol fermentation mash, which include multiple species of <i>Lactobacillus</i> , <i>Lactococcus</i> , <i>Weissella</i> , <i>Leuconostoc</i> , <i>Pediococcus</i> , <i>Enterococcus</i> , and <i>Streptococcus</i> as well as killing activity against non-LAB isolates, such as strains of <i>Staphylococcus</i> , <i>Enterobacter</i> , <i>Bacillus</i> , and <i>Clostridium</i> . The bacteriocin is also combined with broad range bacteriophage to provide synergistic effectiveness against unwanted bacteria in industrial biofuel fermentation process and in human and animal bacterial infections.

Nº Publicación	Solicitante (País)	Contenido técnico
MX2016005014	José Alberto Espejel Pérez (MX)	Method for producing bioethanol from the extraction of fermentable sugars from water lilies (leichhornia crassipes). The present disclosure is related to a procedure for the extraction of fermentable sugars from water lilies, characterized because it comprises: gathering the water lilies in an integral way; wash the collected lilies to get rid of the waste; grinding the already washed water lilies to facilitate its processing; submit the already ground lilies to a hydrolysis first stage at room temperature (20 to 25°C) until reaching the required conditions; submit the obtained product in the previous stage to a second hydrolysis stage to ensure the organic matter degradation; raise the pH level of the hydrolyzed product to maintain the same at a pH of between 5 to 6; submit the hydrolyzed product with the stabilized pH to a first filtration stage to eliminate reaction residues and organic matter; submit the product obtained in the previous stage to a second filtration stage to achieve a higher purity and subjecting the already filtered product to a sugar fermentation stage. For the production of ethanol, the product obtained during the sugar fermentation is subjected to a distillation stage.
WO2018007560	Metabolic Explorer SA (FR)	Method for the fermentative production of molecules of interest by microorganisms comprising genes coding sugar phosphotransferase system (PTS). The present invention relates to a new method for the production of a molecule of interest by conversion of a source of carbon in a fermentative process comprising culturing a microorganism genetically modified for the production of molecule of interest, wherein said microorganism comprises functional genes coding PTS carbohydrate utilization system and wherein the expression of proteins regulated the expression of phosphoenolpyruvate synthase (PPS) is down -regulated. The present invention also relates to the genetically modified microorganism used in the method of the invention.
WO2018004327	Univ Nacional Autónoma de México (MX)	Method for the gas-phase acid treatment of lignocellulosic materials. The present invention relates to a method for the gas-phase acid treatment of lignocellulosic materials, including cellulose mass, hemicellulose mass and lignin mass, in order to obtain high yields of glucose, C5 monosaccharides and lignosulfonates. Said method includes a step of treating lignocellulosic materials allowing the subsequent enzymatic hydrolysis thereof, at treatment temperatures no greater than 160°C, using a reduced number of devices, such as a single stirred reactor, and with low operating costs.
WO2018008546	Tokyo Inst Tech et al. (JP)	Method for producing monosaccharides or oligosaccharides from material containing cellulose and lignin. Provided is, as a means for efficiently producing monosaccharides or oligosaccharides from a material containing cellulose and lignin, a monosaccharide or oligosaccharide production method characterized by comprising: a step for generating monosaccharides or oligosaccharides by bringing a material containing cellulose and lignin into contact with an aqueous acid solution; and a step for separating a liquid containing the monosaccharides or oligosaccharides from a solid matter under a high-temperature condition.
WO2017222084	Idemitsu Kosan CO et al. (JP)	Production method for product derived from plant-based biomass having two-stage process. A production method for a product derived from a plant-based biomass that includes: a processing step (1) for separating a hemicellulose from a plant-based biomass; and a processing step (2) for mixing the solid component obtained from processing step (1) with a solvent selected from an organic solvent alone or a mixed solvent of an organic solvent and water, and heat-treating the mixture.

Nº Publicación	Solicitante (País)	Contenido técnico
WO2017217116	Honda Motor Co Ltd (JP)	Novel microalga having aggregation ability. In the production of ethyl alcohol by taking advantage of autofermentation of a microalga, a step for concentrating or recovering alga cells by centrifugation, filtration, etc. is omitted or simplified so as to save labor and facility required therefor. The microalga, which belongs to the genus Chlamydomonas sp., is a variant that is able to produce ethyl alcohol under anaerobic and dark conditions and has acquired an ability to grow in an aggregate state. In the ethyl alcohol production method, the microalga is grown and maintained under anaerobic and dark conditions to thereby allow the microalga to produce ethyl alcohol.
ES2647322	Abengoa Bioenergía Nuevas Tecnologías SA (ES)	Myceliophthora thermophila host cell having improved cellulolytic activity and enzymatic compounds produced with same. The invention relates to a host cell, preferably a Myceliophthora thermophila cell, which presents a lower expression and/or secretion of non-contributory cellulolytic enzymes, preferably wherein the non-contributory cellulolytic enzyme is endoglucanase 6 comprising SEQ ID NO: 2, thereby promoting the presence of contributory cellulolytic enzymes in the enzymatic cocktail synthesised by said host cell. The invention also relates to the use of said host cells and the enzymatic cocktails synthesised by said host cells for the production of fermentable sugars of biomass, and a method for producing bioproducts, preferably bioethanol, comprising the use of said host cell or the composition according to the invention.

TECNOLOGÍAS QUÍMICAS

Patentes

Nº Publicación	Solicitante (País)	Contenido técnico
WO2018002559	EASYL (FR)	Method for producing fatty acid esters and glycerol at a low temperature. The invention concerns a method for producing fatty acid alkyl esters and glycerol by implementing a set of transesterification reactions between at least one plant or animal oil and at least one aliphatic monoalcohol comprising the following steps: (A) introducing, into a three-dimensional ball mill, separately or in a mixture, at least one plant and/or animal oil, at least one aliphatic monoalcohol and at least one heterogeneous and/or homogeneous catalyst in order to form an initial mixture; (B) milling said initial mixture at a temperature of less than or equal to 50°C, and preferably of less than or equal to 25°C, in a three-dimensional ball mill, for a holding time of less than or equal to 5 minutes, and preferably of between 5 and 30 seconds and typically of between 5 and 15 seconds; (C) recovering, at the outlet of the three-dimensional mill, a final mixture comprising at least fatty acid alkyl esters, glycerol, the catalyst and the unreacted aliphatic monoalcohol; and (D) separating, from this final mixture, a first phase comprising the fatty acid alkyl esters and a second phase comprising the glycerol, the unreacted aliphatic monoalcohol and the catalyst.
US2018016519	Elevance Renewable Sciences (US)	Renewably derived aldehydes and methods of making and using the same. Methods for making specialty chemical products and chemical intermediates using hydroformylation are generally disclosed. Further, compositions and compounds formed using such methods are also disclosed. In some embodiments, methods are disclosed for refining a renewably sourced material, such as a natural oil, to form compositions, which can be further reacted employing the methods disclosed herein to form certain specialty chemical products or chemical intermediates.
US2018057786	Goel Anita (US)	Nano biofuel production processes: Using nanotechnology to enhance production of biofuels. Methods, systems, devices and materials for producing biofuels under nanoscale control ("nanobiofuels") are provided. In one aspect, the invention provides method for producing a biofuel, including providing a hydrocarbon producing organism; exposing the biological hydrocarbon producing organism to conditions effective to cause substantial release of the hydrocarbon from the biological hydrocarbon producing organism; and isolating at least a portion of the hydrocarbon. At least one of the actions of providing, exposing, and isolating is performed using a corresponding nanoscale control.
AU2017279689	Neste OYJ (FI)	Diesel fuel composition, comprising components based on biological raw material, obtained by hydrogenating and decomposing fatty acids. A biodiesel fuel composition comprising at least one isomerized biological component produced by a process comprising: a) providing a feed stream of fatty acids and/or fatty acid esters derived from an animal and/or fish source; b) hydrodeoxygenating the feed stream to form n-paraffins; and c) isomerizing the n-paraffins to form iso-paraffins.
WO2017216382	Novozymes AS (DK)	Reduction of phospholipids in phospholipid-containing oil material. The present invention provides a method for reducing the content of phospholipids in a phospholipid-containing oil material by converting the phospholipids into fatty acid alkyl esters (FAAE) and free fatty acids (FFA). The method comprises reacting a phospholipid-containing oil material with one or more phospholipases in a system comprising a low content of a short chain alcohol and water. The method can be used in degumming or as an enzymatic pretreatment before transesterification and/or biodiesel production, but it can also be used as basic oleochemical in further downstream processes of the oleochemical industry. The present invention also provides a method for producing free fatty alkyl esters (FAAE) from phospholipids in a phospholipid containing oil material by reacting the phospholipids with one or more phospholipases in a reaction mixture comprising a low content of a short chain alcohol and water.

Nº Publicación	Solicitante (País)	Contenido técnico
RU2646755	Tkach Vladimir Vladimirovich (RU)	<p>Production line of biodiesel fuel. FIELD: machine building; technological processes. SUBSTANCE: invention relates to the complex processing of oilseeds, as well as the production of biodiesel fuel from them and can be used in food, fuel industry and agriculture. Biodiesel production line includes a washing machine, dryer, roller machine, separating machine, fryer, forepress, storage tank for oil, oil pumps, drum filter, retention vessel, intermediate oil collector, cyclone, filters, condensate collector, high-temperature steam compression heat pump including a compressor, condenser, thermostatic expansion valve, evaporator; as well as a flow distributor output from the recirculation loop, flow heater, recuperative heat exchanger, methanol collector, potassium hydroxide collector, mixer, hydromechanical mixer with heating jacket, pump-cavitator, separating centrifuge, washing machine is designed for preliminary washing of oil seeds; two parallelly installed and alternating filters in a separation mode with discharge of a filtrate into the condensate collector and withdrawal of sediment in a countercurrent regeneration mode with water supplied from the condensate collector to restore the capacity of the filtering partitions are intended for cleaning the water from the water washing chamber; flow distributor output from the recirculation loop is designed to divert a portion of the spent superheated steam in two streams in an amount evaporated from the product, where one of the streams is fed through a flow distributor of waste steam into a flow heater to heat the oil, and a second stream is fed into the heating jacket of the hydromechanical mixer; condensate collector with possible fresh water make-up is designed to drain the formed condensate in the flow heater and after the hydromechanical mixer together with the condensate after the heat pump evaporator; and the hydromechanical mixer is designed to supply the heated in-flow heater oil together with a previously prepared in the mixer solution of potassium hydroxide in methanol to accomplish the first stage of the transesterification reaction; pump-cavitator is designed to carry out the second stage of the transesterification reaction; and the separation centrifuge is designed to separate the resulting mixture into biodiesel and glycerin, which are taken as target products. Method makes it possible to increase energy efficiency in the production of oil from oil-bearing crops, to ensure a reduction in specific energy inputs, to implement a process line that will allow producing environmentally cleaner biodiesel and glycerine; to create safe conditions for obtaining target and intermediate products in the absence of waste coolant emissions to atmosphere.</p>
MX2015009362	Univ Guanajuato (MX)	<p>Obtention of cobalt ferrite applied as a catalyst for optimizing the fatty acid esterification and transesterification for the biodiesel production process. A hydroxycarbonate Cobalt/Iron was synthesized as a precursor of cobalt ferrite (mixed oxide cobalt/iron). Cobalt ferrite presents a catalytic capacity in the esterification and transesterification reactions of fatty acids. The physiochemical properties of the catalyst allows the reaction time to be reduced for producing biodiesel, increasing the conversion percentage and removing washing stages present in a conventional biodiesel synthesis. The proposed process for the production of the catalyst and the biodiesel is an alternative for reducing costs, increasing the profitability of the industrial production of the biofuel.</p>

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VT BIOMASA

PATENTES

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