

LA INNOVACION ESPAÑOLA EN EL ÁREA DEL BIODIESEL

En la Figura 1 se recoge el número de invenciones españolas para las que se solicitó protección en función de la fecha de prioridad hasta el año 2012. La fecha de prioridad (fecha en que se presenta por primera vez la solicitud de una patente) es la más antigua y, por tanto, puede considerarse la más cercana a la fecha de la invención. Es importante señalar que el número de invenciones durante el periodo analizado puede incrementarse, sobre todo, en los últimos años ya que pueden existir invenciones para las que se hayan solicitado protección y que aún no se hayan publicado sus solicitudes. El interés en proteger las invenciones en el ámbito de la producción de biodiesel comenzó a ser notorio en el año 2006. Anteriormente, solamente, en el año 2000, 2002 y 2005, la Universidad Complutense de Madrid, la empresa Industrial Management SA y la Fundación Cidaut, respectivamente, habían solicitado protección para invenciones relacionadas con la producción de biodiesel.

Entre el periodo 2000-2012, dentro del área del biodiesel, se han identificado 26 solicitantes de origen español (Tabla 1). Los principales solicitantes son empresas, seguidos en igual proporción de universidades y de personas físicas (Figura 2). Más de 60% de los solicitantes tienden a presentar múltiples solicitudes de patentes con respecto a una misma invención. Esto indica la tendencia por parte de dichos solicitantes a utilizar tanto la vía europea como la internacional (Tabla 1).

Cabe destacar que prácticamente el 100% de las patentes solicitadas en España, han sido concedidas. Actualmente, las empresas Neuron Biopharma e Industrial Management SA, así como las universidades de Cordoba y Murcia tienen protegidas sus invenciones en EE.UU. Igualmente, a la empresa Industrial Management SA se le concedió dos patentes europeas y a la Universidad de Cordoba una patente europea.

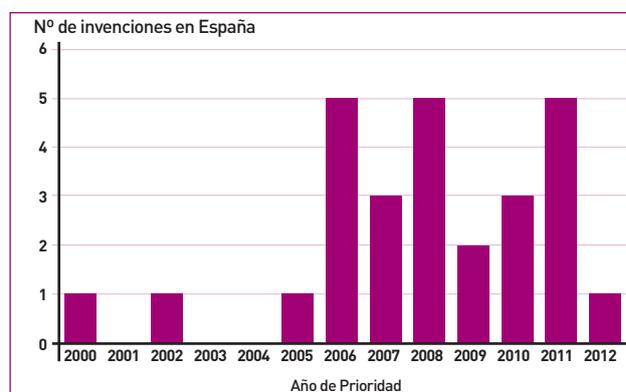


Figura 1: Evolución del número de invenciones relacionadas con la producción de biodiesel para las que se solicitó protección

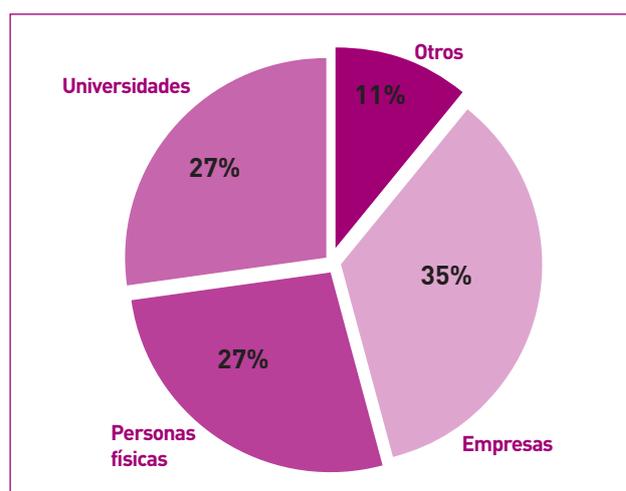


Figura 2: Naturaleza de los solicitantes españoles de patentes en el área del biodiesel

Tabla1:

SOLICITANTES ESPAÑOLES DE PATENTES RELACIONADAS CON BIODIESEL TÍTULO DE LA PATENTES, Nº DE PUBLICACIÓN DE LA SOLICITUD		
Solicitante	Título	Nº Publicación*
Angulo Lafuente, F	Método de obtención de una parafina, mediante un proceso biológico con microorganismos, a partir de material orgánico y su método de refinado para ser utilizado como combustible	ES2341194 EP2196519 WO2009034217
Beeb Bioenergías, SA	Installation for production of biodiesel	EP2169039 WO2008155436
Biodiesel de Andalucía 2004, SA	Procedimiento para la obtención de un biodiesel a partir de aceites vegetales de grado de acidez variable en sistema continuo y combustible biodiesel obtenido	ES2278533 EP1983039
Bioenergética Extremeña 2020, SL	Procedimiento para el refinado de biodiesel, independientemente del origen de la materia prima utilizada en su fabricación	ES2374937
Bio Fuel Systems SL	Fotobiorreactor vertical sumergible para la obtención de biocombustibles	ES2326296 EP2067850 WO2008040828
Blasco García, AC	Continuous process for producing biodiesel fuel	WO2011070445
Botella Galiana, J	Procedimiento para la obtención de combustibles biológicos	ES2281280
Fundación CIDAUT	Procedimiento para la obtención de combustible para motores de ciclo diesel a partir de aceites vegetales usados	ES2245270
CSIC et al	Método de eliminación de jabones cálcicos y procedimiento de síntesis de biodiesel libre de jabones utilizando CaO como catalizador	ES2395964
	Procedimiento de catálisis ácida homogénea que comprende la reutilización de ácido poliestirensulfónico (APES)	ES2391188 WO2012146809
	Procedimiento para aumentar la velocidad de obtención de biodiesel mediante su incorporación como aditivo	ES2334312
García Berrocal, E	Procedimiento para la producción de un biocarburante y aplicación del mismo a motores de vehículos e instalaciones de combustión	ES2283225 WO2008084119
Gomiz Catala, C et al	Fotoconvertidor de energía para la obtención de biocombustibles	ES2288132
Iden Biotechnology, SL	Producción de biodiesel a partir de glicerina	ES2396823 WO2013024196
Industrial Management SA	Use of glycerines tri-acetate as additive of biodiesel fuel compositions	EP1331260
	Process to obtain biodiesel fuel with improved properties at low temperature and comprising glycerine acetates	EP1985684
	Process to obtain biodiesel fuel with improved properties at low temperature	US7637969
Inst Univ de Ciencia i Tecnologia SA	Preparation of fatty acid esters of glicerol formal and its use as biofuel	WO2008006860 EP2049623
Merino Ferrero, V	Método para la obtención de biocombustibles y productos químicos a partir de bioetanol y de subproductos del proceso de producción de etanol	WO200912537 ES2376682
Neuron Biopharma, SA	Procedimiento mejorado para la producción de biodiesel	ES2326022 EP2272956 WO2009118438
NOREL SA et al.	Procedimiento de reciclado de subproductos mediante reconstitución de grasa útiles en alimentación animal	ES2325854 WO2009115635
Repsol SA	Proceso de transesterificación de ésteres con alcoholes empleando catalizadores heterogéneos	ES2376936
Rodríguez García, J	Proceso de producción de biodiesel a partir de aceites vegetales obtenidos a tal efecto o de frituras reciclados	ES2438442
Univ. Cádiz	Proceso para el aprovechamiento de subproductos de la industria agroalimentaria para la obtención de precursores de biocombustibles, alimentos funcionales y cosméticos	ES2395162
Univ. Complutense de Madrid	Procedimiento para la obtención selectiva de productos de alto valor añadido a partir de aceites de fritura usados	ES2162596

SOLICITANTES ESPAÑOLES DE PATENTES RELACIONADAS CON BIODIESEL TÍTULO DE LA PATENTES, Nº DE PUBLICACIÓN DE LA SOLICITUD

Solicitante	Título	Nº Publicación*
Univ. Córdoba	Procedimiento de producción de biodiesel mediante el uso de lipasa pancreática de cerdo como biocatalizador enzimático	ES2289943 EP2050823 WO200800977
Univ. La Laguna	Catalizador heterogéneo para la reacción de transesterificación de aceites vegetales	ES2377788
Univ. Málaga et al	Procedimiento de producción de biocarburantes mediante catálisis heterogénea empleando un cincato metálico como precursor de catalizadores sólidos	ES2345866 WO2010112641
Univ. Murcia	Use of ionic liquids for implementing a process for the preparation of biodiesel	WO2010057996 EP2347000
Univ. Salamanca	Derivados de ácido sulfónico para síntesis de biodiesel	ES2393352

*Si existen varias solicitudes, solo se recogen, la solicitud española, internacional y europea

ANÁLISIS DE PATENTES

Durante el primer trimestre de 2014, se han identificado en la base de datos WPI (World Patent Index), 1.640 familias de patentes sobre tecnologías de conversión de la biomasa para la producción de energía. De la Tabla 2 se desprende que, aproximadamente, el 53% de las referencias encontradas están relacionadas con las tecnologías bioquímicas y el 36% con termoquímicas. La tecnología de digestión anaeróbica es la que cuenta con mayor número de resultados, 43% de los totales.

Tipos de tecnologías de conversión de la biomasa	1 ^{er} trimestre. 2014
Tecnologías termoquímicas	592
Combustión directa	244
Gasificación/pirólisis	348
Tecnologías bioquímicas	861
Digestión anaeróbica	710
Fermentación de azúcares	151
Tecnologías químicas (transesterificación, Fischer-Tropsch síntesis de metanol)	187
Nº TOTAL FAMILIAS DE PATENTES	1.640

Tabla 2. Número de familias de patentes clasificadas por tecnologías

En la Tabla 3 se muestran los países que tienen más de 10 solicitudes. El país líder es China con 972 solicitudes de patente, en segundo lugar, y con gran diferencia, le siguen las solicitudes internacionales (PCT). En tercer y cuarto lugar se encuentra EE.UU y Corea con 186 y 93 solicitudes, respectivamente. España se encuentra en la posición dieciséis, con 6 solicitudes.

En los apartados posteriores se recoge una selección de los documentos de patentes identificados en el trimestre analizado.

	País	Nº referencias
1	China (CN)	972
2	Patente PCT (WO)	242
3	EE.UU. (US)	186
4	Corea (KR)	93
5	Japón (JP)	92
6	Alemania (DE)	49
7	Patente Europea (EP)	37
8	Francia (FR)	30
9	Rusia (RU)	29
10	Malasia (MY)	12
11	Gran Bretaña (GB)	11

Tabla 3. Ranking por países.

TECNOLOGÍAS TERMOQUÍMICAS

Patentes

COMBUSTIÓN DIRECTA		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2014036703	Zhu Hongfeng (CN) et al	Bonfire stove with triple air supply. Disclosed is a bonfire stove with triple air supply, the bonfire stove comprising a burning portion capable of being situated on the ground, a flame portion fixedly provided above the burning portion and extending upwards, and electrical equipment. The burning portion comprises a housing, and a burner is accommodated in the housing. The burner has a fuel holder plate, a side plate and a top plate. The side plate is enclosed to form a burning zone above the fuel holder plate. A flame tube opened to the burning zone is fixedly provided in the top plate above the burning zone, and a number of second-time air supplying holes are provided on the periphery of the flame tube. An air blowing zone is formed between the housing and the burner. A number of first-time air supplying holes are provided on the fuel holder plate. The flame portion comprises a third-time air supplying tube fixedly provided on a top face of the housing and in communication with the flame tube, a fixing tube fixedly provided on the third-time air supplying tube, and a glass round tube inserted into the fixing tube, with a number of third-time air supplying holes being provided on the periphery of the third-time air supplying tube. The electrical equipment comprises a blower in communication with the air blowing zone, a power source and a power source switch. The bonfire stove is able to increase the utilization rate of biomass fuels, to produce a spectacular flame, and to achieve a good visual effect.
WO2014033100	M S Consulting und Beteiligungs GmbH (DE) et al	Furnace for wood-type biomass fuels that are susceptible to agglomeration. The invention relates to a furnace for wood-type biomass fuels, comprising a combustion chamber with a surface having a first bed section positioned at an angle to the horizontal, said section having first fluid-injection means, and comprising a substantially horizontal second bed section having second fluid-injection means. The first fluid-injection means are designed to discharge a gaseous fluid from below the surface of the first bed section in a direction that is substantially orthogonal to the surface of said first bed section and the second fluid-injection means are designed to discharge a gaseous fluid both from below the surface of the second bed section in a direction that is substantially orthogonal to the surface of said second bed section and also laterally when the second bed section is viewed in cross section, at an angle to the surface of the second bed section
WO2014015551	Zhu Hongfeng (CN) et al	Biomass fuel burner. A biomass fuel burner comprising an outer cylinder and an inner cylinder accommodated within the outer cylinder. The inner cylinder is provided with an inner cylinder bottom face and an inner cylinder lateral face. Several primary air supply holes are evenly provided on the inner cylinder bottom face of the inner cylinder; a row of secondary air supply holes consisting of several single holes is provided on the inner cylinder lateral face of the inner cylinder in proximity to an inner cylinder upper edge. An air supply tube in communication with the outer cylinder is provided on the outer cylinder. The ratio between the total area of all of the secondary air supply holes and the total area of all of the primary air supply holes is 1:1.1 to 1.2. The burner increases the efficiency of combustion and the quality of energy conversion.
EP2685158	ARDANTE (FR)	Granule or pellet boiler with cyclonic combustion. The boiler has a combustion chamber arranged within a reservoir. The granules are poured into the combustion chamber through a vertical feed pipe. The amount of pellets flows in a combustion crucible is adjusted when the pellets are obstructed in the pipe. A height adjustable cup is supplied with oxidizer i.e. air, through a supply tube and/or a cooling tube. The feeding pipe is inserted into the cooling tube, in which the secondary air is circulated, where the feeding pipe and the cooling tube are surrounded by a refractory thermal protection unit.

COMBUSTIÓN DIRECTA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014011121	ATECH ELEKTRONIKADO (SI)	Method and device for automatic regulation of optimal conditions of biomass combustion. The technical problem solved by the present invention is regulation of a flow of exhaust gases with the purpose of increasing the efficiency of a biomass powered stove and ensuring optimal combustion conditions. The object of the invention is a method for an automatic regulation of optimal conditions of biomass combustion that following an internal algorithm adequately evaluates data from a temperature sensor of exhaust gases and a draught sensor, and by means of a processor and a user interface sends commands to control electronics for a fan and to control electronic of a mechanical actuator for movement of a shutter. This creates conditions for a rapid cool startup under consideration of various influential burning factors, it allows maintenance of operating temperature by reducing the rate of exhaust gases and an autonomous way of supply of the regulation and control system.; The constructional solution of the device of the invention is designed in modules, wherein the device has a fume shutter of a typical shape, an electronic control circuit, a control electronic regulator, sensors of exhaust gas status, mechatronic actuators and a power unit with a safety function of shutter opening in the case of electricity failure and is controlled by a computer designed intelligent system.
WO2014006564	Lopez Poy Jorge Alejandro (AR) et al	A combustor. A combustor of the type used for producing energy using biomass as fuel, wherein the combustor comprises at least one cyclonic and refractory combustion chamber, said combustion chamber being of a compact size, said combustor defines a means for carrying out the process of pyrolyzing, gasification, reduction and oxidation instantaneously, preheating means define the air temperature which is in a fuel-air ratio close to the stoichiometric $\Delta = 1$, stabilizing means define the automatic control of the system by regulating the air and fuel flow. The biomass to be used as fuel in the present invention must be of millimetric size and the humidity content must not be greater than 30%. It can be used any kind of dry matter of vegetable or peat of different calorific power. The heat generated may be used in all conventional techniques, being in particular very suitable for the Brayton cycle utilizing gas turbine direct circuit combustor effluents.
EP2679908	Hunter Stoves Ltd (GB)	Stove with additional airflow. The invention provides a stove, and method of operating the stove, in which an additional air flow provides improved operating efficiency and other benefits. A stove according to the invention comprises a single closable access opening for supplying fuel to the stove, and a firebox having a base arranged to support burning solid fuel, a front face including the access opening, and a rear face opposite the front face. The stove also comprises a secondary air flow supply having a first outlet at the front face of the firebox that is arranged to direct a first air flow from the secondary air flow supply across the access opening and towards the base of the firebox, and a second outlet at the rear face of the firebox that is arranged to direct a second air flow from the secondary air flow supply from the rear face towards the base of the firebox. The second outlet is closer to the base than the first outlet.
ES1092733	Bronpi Calefaccion SL (ES)	Dispositivo de limpieza automática del quemador para calderas. Dispositivo de limpieza automática del quemador para calderas, aplicable a una caldera de las destinadas a calentar agua y que utilizan combustible sólido granulado, comprendiendo, esencialmente, un depósito de agua y una cámara de combustión con un quemador conectado a un intercambiador de calor y un sistema alimentador del combustible, y que, siendo dicho dispositivo del tipo que se configura como una pieza móvil situada en la parte inferior del cuerpo cilíndrico que constituye el quemador, está caracterizado porque dicha pieza móvil consiste en una pletina que se desliza horizontalmente entre las paredes del quemador y su base de soporte, la cual base presenta un hueco en coincidencia con su zona interior del mismo, presentando dicha pletina.

PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014043051	D4 Energy Group (US) et al	Process and device for devolatizing a feedstock. Provided herein is a method, device and installation for devolatizing a solid feedstock, comprising carbon-based waste selected from the group consisting of hazardous material, biomass, animal manure, tires, municipal solid waste and refuse derived fuel. The method comprises treating the solid feedstock to produce a particle size laying between about 1 cm ³ and about 100 cm ³ . The solid feedstock is passed into a jacketed system. The solid feedstock is contacted with a heated gas, comprising hydrogen, inside the jacketed system at a temperature of about 500 DEG C to about 1000 DEG C for a time of about 60 seconds to about 120 seconds, whereby the solid feedstock is converted into a gas stream and a solid stream.
EP2706296	VT Innovations Ltd (GB)	A pyrolysis assembly and method for harnessing energy from waste materials. The present invention is directed towards an apparatus and method for harnessing energy from waste materials using a pyrolysis assembly, whereby the pyrolysis assembly comprises a pre-pyrolysis treatment plant, a pyrolysis plant, and, a fuel-based energy plant. Waste materials having at least 30% biomass by weight are fed into the pre-pyrolysis treatment plant and the biomass is separated from the waste materials in the pre-pyrolysis treatment plant. The biomass is chemically cracked into at least a char and a gas in the pyrolysis plant and this char and gas is used by the fuel-based energy plant to harness energy from the waste materials. Problems associated with the efficiency of pre-pyrolysis treatment plants and safety of the parts used in the pre-pyrolysis treatment plants is addressed in the current invention
WO2014040034	Phillips 66 CO (US) et al	Biomass pyrolysis process for increasing stability of a pyrolysis product. The present disclosure relates generally to a biomass pyrolysis process wherein entrainment of char and other contaminants with the pyrolysis vapors is decreased as a direct consequence of the biomass feedstock comprising particles that are larger than a defined minimum diameter (→300 microns) and preferably less than 1250 microns. The biomass feedstock may optionally be compressed to form feedstock pellets that are larger than this defined minimum diameter.
WO2014032104	Earth Systems Consulting Pty Ltd (AU)	Efficient drying and pyrolysis of carbon-containing material. A method and apparatus for drying and pyrolysing carbon-containing materials to produce valuable products including char, oil, gas and thermal energy. The present invention involves a method whereby carbon-containing material 1 is maintained in a heated region predominantly free of oxidizing gases to promote pyrolysis reactions, and the thermal energy required to drive the process is provided via the combustion of a proportion of the volatilized matter with an oxygen containing gas in the same chamber 3. The arrangement of the chamber 3 eliminates the need for any form of solid physical barrier between the concurrent pyrolysis and combustion reactions occurring in the process, and also avoids any requirement for external means of recirculating the gaseous volatilized matter. The present invention also relates to a method for improving the transfer of thermal energy from the combustion to pyrolysis zones via radiative and convective heat transfer mechanisms.
ES2437717	Aguilar Lozano Maria Isabel (ES) et al	Método y dispositivo para la fabricación de carbón vegetal a partir de biomasa. Método y dispositivo para la fabricación de carbón vegetal a partir de biomasa. Método de fabricación de carbón vegetal a partir de biomasa vegetal que comprende: a) calentar la biomasa contenida en un reactor de carbonización con salida de gases hasta alcanzar una temperatura mínima de 400 DEG C, b) aumentar la temperatura del reactor de carbonización hasta una temperatura mínima de 600 C, mediante combustión de los gases expulsados por la salida de gases del reactor de carbonización en la etapa a) con una fuente externa de oxígeno, c) carbonizar la biomasa en ausencia de oxígeno manteniendo las condiciones establecidas en la etapa b) hasta que finalice el desprendimiento de gases, d) disminuir la temperatura del reactor de carbonización, y e) extraer el carbón vegetal obtenido del reactor de carbonización.

PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014030064	EB Clean Energy Ltd (IL)	Torrefaction apparatus and process. A system for producing a torrefied biomass that at least partially replaces coal in coal-fired processes. The system comprises: a feed bin for receiving carbonaceous feedstock, conveying the ingested feedstock and treating the ingested feedstock to produce modified feedstock; a dryer that treats the modified feedstock to produce dried feedstock, the dryer including a heater that warms the dried feedstock to produce heated feedstock; a torrefaction subassembly; a particle downsizing system; a separator for separating minerals from the feedstock; and a compactor.
WO2014023758	Albemarle Europe SPRL (BE)	Selective catalytic deoxygenation of biomass and catalysts therefor. This invention provides new, effective pyrolysis catalysts adapted for use in pyrolysis of biomass, to the preparation of such catalysts, and to the use of such catalysts in the pyrolysis of biomass in the absence of added air, added molecular oxygen, and added molecular hydrogen, and liquids such as water. The catalysts are layered HTCs and related materials which are impregnated with specified pairs of metals, which impregnated layered HTCs and related materials have been calcined in air at elevated temperatures.
WO2014023854	Greene Waste to Energy SL (ES) et al	Reactor for obtaining gas from biomass or organic residues and method for obtaining gas in said reactor. The invention relates to a reactor for obtaining gas from biomass or organic residues and to a method for obtaining gas in said reactor in which the process is produced in a single rotatory horizontal reactor, wherein the stages occur in internal sections separated by helical spirals and, by analyzing the synthesis gases by means of a gas chromatograph positioned at the output of the reactor, it is possible to vary the method parameters.
WO2014015415	Enerkem INC (CA)	Production of synthesis gas from biosolid- containing sludges having a high moisture content. A method of producing a synthetic gas or a synthesis gas from a biosolid, such as dewatered sludge, that has a solids content that does not exceed 30 wt. %. The biomass having a solids content that does not exceed 30 wt. % is mixed with tar-rich materials and/or char particles, and optionally a bulking agent. The tar-rich materials and/or char particles may be a by-product of producing synthesis gas from a biomass such as refuse-derived fuels. The resulting mixture then is heated to provide a mixture having a solids content of at least 75 wt. %. The mixture having a solids content of at least 75 wt. % then is gasified under conditions to produce a synthetic gas rich in CO/CO ₂ or a synthesis gas rich in H ₂ /CO.
WO2014016799	Israel State (IL)	Harvester with pyrolysis for bio-fuel crops. Biomass is pyrolyzed in a pyrolysis chamber to produce liquid hydrocarbons and char. Air is excluded from the pyrolysis chamber, at least in part, by directing exhaust gas, from the heating mechanism that heats the pyrolysis chamber, to the feeding mechanism that feeds the biomass into the pyrolysis chamber, and by withdrawing char from an accumulation chamber that receives the char from the pyrolysis chamber in a manner that leaves behind enough char to block air from entering the pyrolysis chamber. Hot char is cooled actively below its temperature of spontaneous ignition. The heating mechanism maintains a thermal gradient in the pyrolysis chamber so that vapors that are predominantly steam and vapors that are predominantly hydrocarbons are produced together in different regions of the pyrolysis chamber and are collected at different respective ports.
WO2014005738	Air Liquide (FR)	Process and apparatus for the gasification of solids. In the gasification of carbonaceous solids with oxygen and/or steam, the solids are at least partly converted to CO and H ₂ in a first process step. In a second process step, a stream containing water then is separated from the product mixture obtained. This stream containing water finally is subjected to water purification in a third process step. This water purification is effected such that three streams with different degrees of purity are obtained, at least one of which is recirculated in the process.

PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014012556	Pyroneer AS (DK)	Apparatus and methods for gasification. The invention relates to a circulating fluidized bed (CFB) reactor for thermal processing of added carbonaceous material, the carbonaceous material normally comprises organic material or organic material mixed with inorganic material such as in straw or other vegetable waste, manure, household rubbish, dried wastewater, dried animal remains or other dried carbonaceous waste products. The invention also relates to a process for manufacturing a combustible product gas having a heating value around 4-8 MJ/Nm ³ from such a carbonaceous material by subjecting the carbonaceous material to pyrolysis in one process step and oxidation in two subsequent process steps. A circulating fluidized bed (CFB) reactor according to the invention comprises a primary char gasification chamber and an intermediate char gasification chamber typically provided with a fluidized bed wherein the height of the second fluidized bed in the intermediate char gasification chamber is larger than the height (h _n) of the first fluidized bed in the primary char gasification chamber.
WO2014007898	Battelle Memorial Institute (US) et al	Methods for sulfate removal in liquid-phase catalytic hydrothermal gasification of biomass. Processing of wet biomass feedstock by liquid-phase catalytic hydrothermal gasification must address catalyst fouling and poisoning. One solution can involve heating the wet biomass with a heating unit to a pre-treatment temperature sufficient for organic constituents in the feedstock to decompose, for precipitates of inorganic wastes to form, for preheating the wet feedstock in preparation for subsequent removal of soluble sulfate contaminants, or combinations thereof. Processing further includes reacting the soluble sulfate contaminants with cations present in the feedstock material to yield a sulfate-containing precipitate and separating the inorganic precipitates and/or the sulfate-containing precipitates out of the wet feedstock. Having removed much of the inorganic wastes and the sulfate contaminants that can cause poisoning and fouling, the wet biomass feedstock can be exposed to the heterogeneous catalyst for gasification.
WO2014008995	Linde AG (DE)	Method for the gasification of carbonaceous feedstock. The invention relates to a method for the gasification of carbonaceous feedstock, in particular biomass. According to the invention, in order to cool and/or heat the system components used for the gasification, i.e. in particular gasification reactors and/or pyrolysis gas lines, a molten salt is used.
WO2014001632	UPM Kymmene Corp (FI)	Process for converting biomass to liquid fuels. The present invention relates to a process for converting biomass, comprising the stages where, in the first stage starting material comprising biomass is subjected to pyrolysis under pyrolysis conditions to yield pyrolysis oil, in the second stage the pyrolysis oil is subjected to non-catalytic high pressure high temperature treatment, followed by separation of an aqueous phase and HTHP treated pyrolysis oil, and in the third stage the HTHP treated pyrolysis oil is subjected to hydroprocessing in the presence of at least one hydroprocessing catalyst and hydrogen, whereby an effluent comprising one or more hydrocarbons boiling in the liquid fuel hydrocarbon range is obtained. The invention also relates to hydrocarbon components useful as transportation fuel or as a blending component in transportation fuel, obtainable by said process.
WO2014003943	UOP LLC (US)	Decontamination of deoxygenated biomass-derived pyrolysis oil using ionic liquids. Embodiments of methods for purifying a biomass-derived pyrolysis oil are provided. The method comprises the step of contacting the biomass-derived pyrolysis oil with a first deoxygenating catalyst in the presence of hydrogen at first predetermined hydroprocessing conditions to form a first low-oxygen biomass-derived pyrolysis oil effluent. The low-oxygen biomass-derived pyrolysis oil effluent is contacted with an ionic liquid to remove phenolic compounds, nitrogen compounds and other impurities. This ionic liquid step may be followed by a second deoxygenation step or the deoxygenating may be completed and then followed by the ionic liquid purification step.

TECNOLOGÍAS BIOQUÍMICAS

Patentes

DIGESTIÓN ANAERÓBICA		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2014030583	Kubota KK (JP)	System and method for treating wastewater containing suspended organic substance. A system for efficiently treating a wastewater which contains suspended organic substances in a high concentration, the system being equipped with: a suspended-organic-substance separator which separates the suspended organic substances from the water to be treated; an anaerobic sludge digester which anaerobically digests the suspended organic substances separated by the suspended-organic-substance separator; a device for conversion into nitrous acid, the device oxidizing the ammonia contained in the digested liquid from the anaerobic sludge digester into nitrous acid under aerobic conditions; an autotrophic denitrification device whereby the ammonia contained in the treated liquid from the device for conversion into nitrous acid is oxidized into nitrogen gas under anaerobic conditions with an autotrophic denitrifying microorganism; and a first transfer route (R1) through which the separated liquid from which the suspended organic substances have been removed in the suspended-organic-substance separator is supplied to the device for conversion into nitrous acid.
WO2014027165	Bonhomme Michel (FR) et al	Method and device for continuous dry methanisation. The device for continuous dry methanisation, in a fermenter comprising a closed tank, comprises: - a means for fermenting thick material comprising at least 17 % dry matter, in at least one compartment of said tank, and - a means for injecting, via at least one chimney that descends through at least one of the compartments, pressurised gas close to the bottom of the compartment, configured to create, by the rising of the injected gas through the thick material, a convective movement in the thick material around the chimney, stirring the material, in particular that which is found at the bottom of the compartment. In embodiments, the tank comprises a first compartment into which the thick material is introduced and a second compartment into which the hydrolysed thick material flows after hydrolysis and acidogenesis in the first compartment, methanogenesis taking place in the second compartment.
WO2014023582	DSM IP ASSETS BV (NL)	Production of biogas. The present invention provides a process for the conversion of organic material into biogas comprising treating said organic material with an enzyme composition comprising a hemicellulase and a pectinase, preferably a hemicellulase, a cellulase and a pectinase, to reduce the viscosity of the organic material, followed by a fermentation to produce the biogas.
WO2014020544	Mahrer Francois-Regis (CH)	Apparatus for receiving and conditioning organic waste by anaerobic bioconversion. An apparatus for receiving and processing organic waste by anaerobic bioconversion comprising a closed tank which is the bioconversion site, provided in the top portion thereof with a gasometric bell for storing and pressurising the biogas produced, around which the external members of the apparatus are distributed on a pod which also forms the support for a body of the digester. The tank, in a preferred embodiment, comprises a main enclosure which is the bioconversion site, and a secondary central enclosure called the crop, intended to receive and store the organic waste to be processed before the dosing of same into the main enclosure to complete the bioconversion. The crop forms a removable subassembly that can be configured in different ways, with a circulation and distribution block on which it is secured and with a liquid-solid phase separator which is mounted over same. This subassembly engages with a mechanical stirrer for stirring the fermentative medium contained inside the tank, driven by the gasometric bell, which is centred and rotated by a drive device, for example one carried by the arm of a telescopic bracket mounted over same, or by a drive ring.

DIGESTIÓN ANAERÓBICA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014015949	Niederbacher Michael (IT)	<p>Biogas plant. The invention relates to a biogas plant comprising a fermenter vessel, in which an assembly support is mounted, preferably vertically oriented, wherein an assembly, in particular a submersible motor driven stirrer, is retained by means of a height adjustment device so as to be vertically adjustable on the assembly support. According to the invention the height adjustment device is formed by a belt drive of which the traction means is guided around at least two deflecting elements spaced apart from one another in the longitudinal direction of the assembly support, wherein at least one of the deflecting elements can be driven in rotation by means of a driving device and wherein the assembly is coupled to the traction means in such a way that when the deflecting element is rotationally actuated in a first direction the assembly is raised and when the deflecting element is rotationally actuated in a second, opposite direction, the assembly is lowered.</p>
EP2692415	Inst Tele i Radio-tech (PL)	<p>The manner of and the device for increasing biogas net calorific value. The manner of increasing biogas net calorific value is based on the following: biogas, dried and purified of sulfur compounds, and compressed, and mixed with hydrogen, is processed in unbalanced plasma with the electron energy of ca. 1 eV and inert gas temperature within the range of 1500K-2000K, as a result of which carbon dioxide is hydrogenated and simple aliphatic hydrocarbons are created. Then post-reaction gases are cooled down and hydrogen is separated, while the remaining gases mixture is combusted and energy is generated. The resultant combustion gases are dried, dust is filtered, and then nitric oxides are decomposed, after which carbon dioxide is released. The resultant gas, with nitrogen as the main gas, is let out to chimney. The device for increasing net calorific value of biogas from a biogas plant / 1 / is equipped with: biogas drying system / 2 / , biogas purification system of sulfur compounds /3/ , purified gas compressing system / 4 / , and plasma reactor /7/ with gas feeding system /6/ , equipped with post-reaction gases cooler / 8 / with condensed water tank /9/ , connected with hydrogen separator /10/. Post-reaction gases cooler /8/ and hydrogen separator /10/ are connected with the post-reaction gases control system /11/ . Hydrogen separator /10/ is connected with hydrogen tank /5/ connected with the gases feeding system /6/ and post-reaction gases control system /11/ and cogenerator /12/ , which in turn, is connected through the combustion gases drying system /13/ and dust filter /14/ with the reactor used for NO_x decomposition /15/ connected with the carbon dioxide separation system from the combustion gases /16/. Hydrogen separator /10/ with the hydrogen tank /5/ and gas feeding system /6/ to plasma reactor /7/ is connected by hydrogen return line /17/ . The carbon dioxide separation system from the combustion gases /16/ is connected with cogenerator /12/ by carbon dioxide return line /18/ .</p>
EP2692701	Rus Gabriel Marius (RO)	<p>Process and plant for wastewater treatment and energy generation. The present invention concerns a procedure and a installation. The installation is a Power Plant (PP) and a Waste Water Treatment Plant (WWTP) because it generates electrical power as long as it treats the wastewater in accordance with NTPA011 standard. The procedure described is scalable from 280 population equivalent to 200,000 population equivalent (municipal waste water). The most important objects of the installation are: harvested free water surface constructed wetland with greenhouse (FWSG), digester (D), reformer (R), hydrogen storage system (HSS), greenhouse heating system (GH) . The procedure and the installation are built around two aquatic plants: Eichhornia crassipes and Myriophyllum spicatum. A fraction of the Eichhornia crassipes area is harvested and the biogas that results is reformed and stored in graphene based materials to be burned during the winter in a low-intensity radiant heating system for heating the greenhouse. From this point of view the installation acts like thermal machine with cycle of one year, because the energy conversion efficiency is calculated over a year period.</p>

DIGESTIÓN ANAERÓBICA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014012952	Bekon Holding AG (DE)	Method for operating a biogas system and a biogas system operated in such a manner. The invention relates to a method for operating a biogas system according to the principle of dry fermentation with a plurality of biogas fermenters that are run in batch mode. At least one of the biogas fermenters has just been loaded with fresh biomass and the other biogas fermenter or fermenters are in the state of producing more highly concentrated biogas. The method provides for closure of the at least one biogas fermenter loaded with fresh biomass and connection of the at least one biogas fermenter loaded with fresh biomass to at least one of the other biogas fermenters producing biogas. In addition, there is a return of the biogas mixture from the at least one freshly loaded biogas fermenter to at least one of the other biogas fermenters producing biogas. After expiration of a defined time duration, the return of the biogas mixture from the freshly loaded biogas fermenter is stopped. The invention also relates to a biogas system which is suitable for operation in accordance with the method of the invention.
WO2014016797	DEGREMONT (FR)	Process for reducing the production of sludge by municipal or industrial wastewater purification plants, and equipment for the implementation thereof. A process for reducing the production of sludge by municipal or industrial wastewater purification plants, comprising a step of mesophilic or thermophilic anaerobic digestion, or anaerobic digestion combining these two operating modes, of a stream of sludge to be treated, and at least one biological solubilization anaerobic treatment step; the process comprises, upstream of the anaerobic digestion step, a step of dehydration of the sludge to be treated, followed by a step of mixing the dehydrated sludge with a recirculated fraction of sludge that is more liquid, originating from recycling of the digestion, and/or from the anaerobic treatment step, and/or concentrates originating from a final dehydration of the treated sludge, wherein the recirculation rate is chosen such that the mixture has a dryness suitable for digestion, this mixture then being directed towards the digestion.
WO2014015427	ANAERGIA INC (CA)	Partially divided anaerobic treatment system. In a waste treatment system and process, relatively low and high solids concentration streams are treated in generally parallel anaerobic reactors. The reactors may share a common wall or gas collecting cover. The reactors may also share a common downstream aerobic treatment unit. Solids produced during downstream treatment of effluent from one or both anaerobic reactors may be returned to the high solids concentration stream. The low solids concentration stream may be treated in an attached growth anaerobic digester.
WO2014012817	Voith Patent GmbH (DE)	Anaerobic waste water treatment having sludge degassing and sludge feedback, and treatment plant. The invention relates to a method and an associated plant for biological waste water cleaning by means of biological sludge having anaerobic micro-organisms, wherein the biological sludge is situated in a reactor tank, the waste water is fed under the biological sludge, flows through the biological sludge from bottom to top and is discharged above the biological sludge. A reduction in degradation performance is counteracted by degassing biological sludge that is discharged together with the waste water from the reactor tank and at least partially feeding said biological sludge back into the reactor tank.
WO2014013494	Aquanos Energy Ltd (IL)	Systems and methods for waste treatment. Systems and methods for aerobically processing waste, in which an aerobic bioreactor is in selective fluid communication with a source of oxygen-rich liquid medium. The aerobic bioreactor is configured for aerobically processing waste via bacteria fixed on media to provide processed effluent from the waste. The source of oxygen-rich liquid medium is different from the aerobic bioreactor.

DIGESTIÓN ANAERÓBICA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014005237	Hansen Fernandez Felipe (CL) et al	Tubular digester. The invention relates to a continuous-flow anaerobic digester for the methanisation of organic matter and the production of fertiliser, which enhances the conditions and performance of the anaerobic digestion process, by means of homogenisation of both the sludge and the temperature of the process. The tubular digester consists of a flexible polymer tube comprising: a biogas discharge valve, sludge inlet and outlet connections, and a zipper which is water- and gas-tight and resistant to the corrosive elements of the digestion, said elements being housed in the middle portion of the ends of the digester. The digester also includes a drain. According to the invention, the base of the digester comprises a gas irrigation system for biogas recirculation, consisting of modular gas diffusing circuits disposed as appropriate in each case, made from a polymer material resistant to corrosion from the elements produced by the anaerobic digestion.
WO2014001349	DSM IP ASSETS BV (NL)	Phytase in biogas production. The invention relates to a process for the production of biogas from organic material comprising: treating said organic material with an enzyme composition comprising a phytase, preferably a phytase and a cellulase and/or hemicellulase, and digesting the enzyme treated organic material to form biogas, and further to the use of an enzyme composition comprising a phytase to increase the digestibility of proteins and polysaccharides by microbes present in a process suitable for the conversion of organic material into biogas; the use of an enzyme composition comprising a phytase to increase the availability of minerals in a process suitable for the conversion of organic material into biogas; and the use of an enzyme composition comprising a phytase to reduce precipitation of salts on hardware such as (metal) surfaces and in lines and pumps in a process suitable for the conversion of organic material into biogas. Adding phytase to a biogas process advantageously results in increased biogas production, a more robust biogas production process, and reduced batch-to-batch variation, and allows the use of mixtures of organic material.
WO2014004933	Avatar Energy LLC (US) et al	ZONAL MIXING FOR TUBULAR PLUG FLOW DIGESTERS. A system for zonal mixing in a tubular digester pumps biogas from the digester's headspace back into the bottom of the digester. The rising bubbles of biogas create upward and downward currents capable of thoroughly mixing the digester contents in a zonal manner. Biogas is blown from the gas outlet in the upper portion of the hull through biogas bubble bars located inside the digester hull. Check valves are positioned along the biogas bubble bar to allow the biogas to flow out while the blower is running, but prevent the liquid contents of the digester from flowing into the biogas bubble bar when the blower is turned off. A pipe assembly joins the various components together.
WO2014004562	ORGANIX INC (US)	A system and method for the anaerobic digestion of organic material to biogas and post-digested fiber. A method and system for the anaerobic digestion of organic material to biogas and post-digested fiber during its first stage. The system comprising a bioreactor vessel for receiving a volume of feedstock therein, a fluid circulation system for recirculating waste fluids through the feedstock, a biogas collection system for collecting biogas generated by said feedstock, and an aeration system for aerating said feedstock.

FERMENTACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014033345	Univ Autonoma Madrid (ES) et al	Microbial consortium for the production of hydrogen. The invention relates to a microbial consortium comprising a Clostridium roseum strain with Spanish Type Culture Collection access number CECT8187 and a Streptomyces sp. strain with Spanish Type Culture Collection access number CECT8185. The invention also relates to the use of said consortium for the production of hydrogen, organic acids, solvents or biofilms, and to a method for producing said consortium.

FERMENTACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014033018	DSM IP ASSETS BV (NL)	Yeast strains engineered to produce ethanol from acetate. The present invention relates to a yeast cell comprising: a) a disruption of deletion of one or more gene native in the yeast cell coding for an enzyme having glycerolphosphate dehydrogenase (GPD) activity; b) an exogenous polynucleotide coding for an enzyme having aldehyde oxidoreductase activity, wherein the polynucleotide comprises a nucleotide sequence coding for an amino acid sequence with at least 50% amino acid sequence identity with SEQ ID NO: 12.
WO2014033256	ESTIBIO APS (DK)	Process for the production of ethanol.Lignocellulosic biomass is pre-treated to provide crude monosaccharides and crude polysaccharides, which are then hydrolysed in the presence of at least one enzyme to provide crude monosaccharides. These are continuously provided in an aqueous fermentation broth at a concentration such as 100 g/L along with associated inhibitory factors to a fermentation vessel containing suspended thermophilic microorganisms, and then continuously fermented at elevated temperature by said microorganisms to form ethanol. At least a portion of said ethanol is continually removed from the fermentation broth to permit the fermentation to continue despite the introduction of the inhibitory factors.
WO2014035458	MASCOMA CORP (US)	Expression of enzymes in yeast for lignocellulose derived oligomer cbp. The present invention provides a multi-component enzyme system that hydrolyzes hemicellulose oligomers from hardwood which can be expressed, for example, in yeast such as <i>Saccharomyces cerevisiae</i> . In some embodiments, this invention provides for the engineering of a series of biocatalysts combining the expression and secretion of components of this enzymatic system with robust, rapid xylose utilization, and ethanol fermentation under industrially relevant process conditions for consolidated bioprocessing. In some embodiments, the invention utilizes co-cultures of strains that can achieve significantly improved performance due to the incorporation of additional enzymes in the fermentation system.
WO2014033759	Dept of Biotechnology Ministry of Science & Technology (IN)	Modified bacteria for the production of bioalcohol. The present invention provides a modified bacterial strain capable of fermenting both hexose and pentose sugars for production of bioalcohol wherein a promoter of pyruvate dehydrogenase operon (PDH) is replaced with a promoter of a gene that is expressed under anaerobic conditions. The present invention further provides a method of obtaining modified bacterial strain capable of fermenting both hexose and pentose sugar for production of bioalcohol. The present invention also provides a method of fermenting lignocellulosic biomass having hexose and pentose sugar using the modified bacteria for production of biomass.
WO2014033476	ENSUS LTD (GB)	Hydrolysis and fermentation process. A method for processing the thin stillage stream resulting from a bioethanol production process comprises, firstly, partial hydrolysis of the thin stillage stream resulting from the bioethanol production process in order to convert non starch polysaccharides to soluble oligomers and monomers. Secondly, it comprises fermentation of the soluble oligomers and monomers in the partially hydrolysed thin stillage to produce ethanol. Thirdly, it comprises recycling of the product stream resulting from partial hydrolysis of the thin stillage stream and fermentation of the soluble oligomers and monomers to the front end of the bioethanol production process such that the ethanol produced during fermentation is recovered as part of a bioethanol recovery process in the bioethanol production process. A companion apparatus for processing the thin stillage stream resulting from a bioethanol production process and an animal feed product produced by the aforementioned method are also described.
WO2014030745	Nat Univ Corp Univ Kobe (JP)	Method for producing ethanol from biomass. Provided is a method for producing ethanol with high efficiency through the ethanol fermentation from xylose using a saccharified biomass that contains various fermentation-inhibiting substances. A method for producing ethanol from a biomass according to the present invention comprises the steps of mixing xylose-utilizing yeast that has been so transformed as to over-express a gene for an acetic acid response transcription factor with a saccharified biomass and then culturing the yeast.

FERMENTACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014023978	Bryant David (GB) et al	Biofuel from grass. Biofuel production processes include pressing grass to obtain grass juice; separating liquid from the grass juice; pasteurising the liquid; acidifying and incubating the liquid; and fermenting the liquid in order to produce biofuel including bioethanol.
WO2014019047	Ferreira Flavio Roberto Mota (BR) et al	Method for producing ethanol from by-products of eucalyptus processing. A method is described for producing ethanol from by-products of eucalyptus processing, comprising the production of hydrolysates by the action of cellulases on the cellulose fraction of by-products of eucalyptus processing for the production of cellulose and paper, as well as fermentation of the resulting hydrolysate using compressed baker's yeast (<i>Saccharomyces cerevisiae</i>) - simultaneous saccharification and fermentation process (SSF process).
WO2014021163	Toyota Motor CO Ltd (JP) et al	Method for producing ethanol using recombinant yeast. The purpose of the present invention is to improve the efficiency of ethanol fermentation in the presence of acetic acid and to achieve excellent ethanol productivity. A yeast mutant strain, which has a deficiency of an acetoaldehyde dehydrogenase gene corresponding to at least one acetoaldehyde dehydrogenase gene selected from the group consisting of ALD4 gene, ALD5 gene and ALD6 gene in <i>Saccharomyces cerevisiae</i> , is cultured in a culture medium containing acetic acid, and ethanol in the culture medium is then collected.
WO2014017945	Enikeev Ajrat Hasanovich (RU) et al	Zero-waste method for producing ethanol and apparatus for implementing same. The group of inventions relates to the alcohol industry. The method involves separating wort, cooled to fermentation temperature, into a liquid phase and a solid phase. The solid phase, having a moisture content of 85-90%, is sent to a separator, resulting in a solid phase having a moisture content of 55-60%, which is then dried, resulting in a cereal product for feed and food purposes. The liquid phase is used as a culture medium for fermentation, with the subsequent production of ethanol in distillation apparatuses. Following the distillation of ethanol, part of the liquid phase is returned to the stage of mixing ground grains with water, while another part is used as mineral feed for agricultural crops. The apparatus for implementing said method comprises a mixer, first and second stage mechanical fermentation processing apparatuses, a sterilizer, a vacuum-saccharifier, a preliminary thickener, a second separator, a drying apparatus, an ultrafiltration device and distillation apparatuses.
WO2014019589	INBICON AS (DK)	Methods of processing lignocellulosic biomass using single-stage autohydrolysis and enzymatic hydrolysis with c5 bypass and post-hydrolysis. The invention relates, in general, to methods of processing lignocellulosic biomass to fermentable sugars and to methods that rely on hydrothermal pretreatment. Xylose monomer yields comparable to those achieved using two-stage pretreatments can be achieved from soft lignocellulosic biomass feedstocks by pretreating to very low severity in a single-stage pressurized hydrothermal pretreatment, followed by enzymatic hydrolysis to release xylose retained in the solid state. In some embodiments, pretreated biomass is separated into a solid fraction and a liquid fraction, the solid fraction subject to enzymatic hydrolysis, and the separated liquid fraction subsequently mixed with the hydrolysed solid fraction.
WO2014018368	NOVOZYMES AS (DK)	Methods for increasing enzymatic hydrolysis of cellulosic material. The present invention relates to methods for increasing hydrolysis of a pretreated cellulosic material, comprising subjecting the pretreated cellulosic material to a cellulolytic enzyme composition; a polypeptide having cellulolytic enhancing activity; a Peroxidase; and a nonionic surfactant and/or cationic surfactant, at conditions suitable for hydrolyzing the pretreated lignocellulosic material. The invention also relates to processes for producing a fermentation product comprising a hydrolysis step of the invention and a composition suitable for use in a method of the invention.

FERMENTACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014012017	EDENIQ INC (US)	Two-loop dilute preprocessing and pretreatment of cellulosic feedstocks. The present application describes a dilute two-loop method for treating biomass in the production of biofuels such as ethanol. The method involves washing the biomass to dissolve sugars that are associated with the biomass, and separating the washed biomass into a solids phase and a liquids phase. The solids phase is pretreated to render the biomass more susceptible to hydrolysis under conditions that do not produce substantial amounts of sugars. The pretreated biomass is separated into a second solids phase and second liquid phase, and the second solids phase is saccharified and fermented. The first and second liquid phases are recycled to dilute the biomass at various stages of the process.
WO2014009749	Kind Consumer Ltd (GB)	Process for using tobacco. The present invention relates to processes for deriving components or products from tobacco biomass. In particular the invention relates to a process for deriving two or more components or products from a single tobacco biomass stock, wherein during the process, at least one component or product, for example nicotine, is extracted from a liquid phase and at least one component or product, for example an organic molecule such as an alcohol, is produced from a solid phase. The invention also relates to products, particularly plastics, synthesised from the organic molecules derived from the biomass stock.

TECNOLOGÍAS QUÍMICAS

Patentes

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014039613	Fogfuels INC (US)	Methods and system for converting heterogeneous waste stream of fats, oils, and grease (fog) into biodiesel. The present invention is directed to production of alternate burning fuels, and more particularly to the conversion of renewable resources such as fats, oils, and grease (FOG) that are typically present in residential and industrial waste streams into clean burning bio-degradable, non-toxic alternative fuels, a/k/a biodiesel. The lipid rich material present in the waste water of cooking and food processing operations is frequently referred to as FOG (i.e., Fats, oils and Greases) and is present in grease trap waste (GTW).
WO2014037006	Aarhuskarlshamn AB (SE)	Method for processing a vegetable fat composition. The invention relates to a method for processing a vegetable fat composition (VFC), the method comprising the steps of -providing the vegetable fat composition (VFC), -in a first neutralization step (FNS) separating free fatty acids from the vegetable fat composition (VFC) thereby obtaining a neutralized vegetable fat composition (NVF), -in a separation step (FRA) separating the neutralized vegetable fat composition (NVF) into a first fraction (FF) rich in StOO and/or OOO and a second fraction (SF) rich in StOSt (where St = stearic acid and O = oleic acid), -in a second neutralization step (SNS) adding to the first fraction (FF) a second base (SB) thereby obtaining a neutralized first fraction (NFF), -feeding the neutralized first fraction (NFF) and a stearic acid source (SAS) into an enzymatic transesterification step (ETE) transesterifying the neutralized first fraction (NFF); by means of enzymes with 1,3-specific transesterification activity thereby obtaining a transesterified first fraction (TFF).
WO2014031319	Chevron USA INC (US)	Single step process for production of distillate fuel. The present invention is directed to preparing distillate fuel having almost no oxygen and no carbon-to-carbon double bonds. The method comprises passing biodiesel and/or lipids derived from vegetable oils, algae oils, and/or animal fats over bio-feedstock, or lipids, conversion catalyst that performs the hydrocarbon isomerization function, removes oxygen from the feedstock, cracks off the C3 backbone, and saturates double bonds. The process is a single step process eliminating the need of a separate costly hydrotreating step while producing a renewable source distillate fuel.

Nº Publicación	Solicitante (País)	Contenido técnico
EP2689837	Basf SE (DE)	Process for making fatty acid lower alkyl esters via transesterification. Suggested is a process for making fatty acid lower alkyl esters by transesterification of fatty acid glycerides with lower aliphatic alcohols where the reaction takes place in a micro-mixer connected to a capillary, wherein (a) fatty acid glycerides (compound a) are heated to a temperature of 45 to 65 DEG C; (b) a mixture of at least one lower aliphatic alcohol and an alkaline catalyst (compound b) are preheated to a temperature of 20 to 50 DEG C; (c) both compounds (a) and (b) are fed into at least one micro-mixer for transesterification, whereby the mixture is heated under a pressure of about 1.1 to about 3 bar to a temperature of about 65 to about 100 DEG C; (d) the reaction mixture thus obtained and leaving the micro-mixer is fed into at least one capillary or tube for residence; and optionally (e) the reaction product thus obtained is subjected to a separation step for purification.
WO2014007622	Cooperatie Avebe U (NL)	Lipase in short-chain esterification of fatty acids. Patatin, a lipase obtainable from potatoes, has been found to have advantages in the esterification reaction of fatty acids to yield fatty acid alkyl esters. Methods for application of this lipase activity are described, as well as the use of patatin in various industrial processes
WO2014008301	Chen Eugene (US) et al	Biorefining compounds and organocatalytic upgrading methods. The invention provides new methods for the direct umpolung self-condensation of 5-hydroxymethylfurfural (HMF) by organocatalysis, thereby upgrading the readily available substrate into 5,5'-di(hydroxymethyl) furoin (DHMF). While many efficient catalyst systems have been developed for conversion of plant biomass resources into HMF, the invention now provides methods to convert such non-food biomass directly into DHMF by a simple process as described herein. The invention also provides highly effective new methods for upgrading other biomass furaldehydes and related compound to liquid fuels. The methods include the organocatalytic self-condensation (umpolung) of biomass furaldehydes into (C8-C12)furoin intermediates, followed by hydrogenation, etherification or esterification into oxygenated biodiesel, or hydrodeoxygenation by metal-acid tandem catalysis into premium hydrocarbon fuels.

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PATENTES

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