Fundación OPTI

SECTOR BIOMASA

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BOLETÍN ON-LINE

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vigilancia tecnológica

2º trimestre 2011

Nueva hoja de ruta europea sobre biocombustibles de segunda generación para el sector de la aviación

La Comisión Europea (CE), Airbus, las principales aerolíneas del continente y los productores de biocarburantes, han presentado en París un compromiso conjunto de desarrollo de estos combustibles para la aviación comercial. En la hoja de ruta planteada (*European Advanced Biofuels Flightpath*) se pretende alcanzar en 2020 la utilización de dos millones de toneladas de biocarburantes de segunda generación en vuelos comerciales. La CE confirma que, antes de presentarla, la iniciativa ha sido ampliamente discutida y consensuada entre los representantes de energía y transporte y organismos de investigación de los Estados miembros, las industrias de la aviación y los biocarburantes y las organizaciones no gubernamentales.

El acuerdo lleva asociado un *Flight path*, una especie de cronograma en el que se marcan los tiempos y las actuaciones a llevar a cabo. Hay un aspecto común a los contenidos del acuerdo: todos los biocarburantes se producirán en la UE con materias primas de la UE y con sistemas de producción y tecnologías de segunda generación. Entre 2011 y 2014 se desarrollarán varios proyectos con biocarburantes de síntesis (gasificación con proceso Fisher-Tropsch) y biodiésel con utilización de hidrógeno en el proceso (Hydrotreated Vegetable Oil, HVO). En esta primera etapa se realizarán pruebas y algunos vuelos regulares, inversiones y fomento de ayudas para construir las primeras plantas comerciales, acuerdos de compra entre aerolíneas y productores de biocarburantes y el inicio de construcción de las primeras plantas, que está previsto que estén operativas entre 2015 y 2016.

A medio plazo, entre 2015 y 2018 se espera contar con las primeras 2000 toneladas de una de las materias primas por las que se apuesta en esta etapa: aceite de algas. De las primeras plantas mencionadas se espera obtener el primer millón de toneladas de HVO y otras 200000 toneladas de biocarburantes sintéticos para mezclarlas ya con queroseno en los aviones. El final de este medio plazo concluye con el inicio de construcción de la siguiente serie de plantas de segunda generación que incluyen biocarburantes a partir de aceite de algas y de otros aceites y residuos. Todas ellas servirían para abordar la última etapa, con el suministro de las restantes 800000 toneladas a partir de esos nuevos biocarburantes.

Simultáneamente a la presentación de esta hoja de ruta, el Paris Air Show, celebrado en París en el mes de Junio, fue el lugar de muestra de los primeros aviones que realizan vuelos transatlánticos con mezclas de queroseno y biodiésel de camelina. El primero, realizado con el *Green Jet Fuel* de la empresa Honeywell, llevaba un 50% de mezcla en uno de los motores, y el segundo, protagonizado por un Boeing 747-8, llevaba un 15% en cada uno de sus cuatro motores. En la misma cita, el consorcio aeroespacial europeo EADS presentó el *Zero Emission Hypersonic Transportation*, un proyecto de aeronave del futuro capaz de enlazar Tokio con París (5000 kilómetros) en dos horas y media y de nuevo con los biocarburantes como uno de sus propulsores.

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Análisis de patentes

En el segundo trimestre de 2011 se han identificado en la base de datos WPI (World Patent Index) 696 nuevas familias de patentes con documentos sobre tecnologías de conversión de la biomasa para la producción de energía. Atendiendo a la Tabla 1 puede inferirse que, aproximadamente, el 45% de las referencias encontradas están relacionadas con tecnologías termoquímicas y el 39% con bioquímicas. El 16% restante se refiere a tecnologías químicas. Las tecnología de combustión cuenta con más de ciento cincuenta resultados.

TABLA 1. Número de familias de patentes clasificadas por tecnologías

TIPOS DE TECNOLOGÍAS DE CONVERSIÓN DE LA BIOMASA	2º TRIM. 2011
Tecnologías termoquímicas	312
Combustión directa	164
Gasificación	116
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Tecnologías bioquímicas	271
Digestión anaeróbica	138
Fermentación de azúcares	133
Tecnologías químicas (transesterificación, Fischer-Tropsch síntesis de metanol)	113
Nº TOTAL FAMILIAS DE PATENTES	696

En la Tabla 2 se muestran los países líderes. Cabe destacar que el 50% de los documentos identificados se solicitaron en China y el 22% son solicitudes internacionales de patente (PCT). A continuación, aunque en menor medida, destaca EE.UU. (16%). España solamente dispone de una referencia.

TABLA 2. Ranking por países

	PAÍS	Nº REFERENCIAS
1	China (CN)	348
2	Patentes PCT (WO)	152
3	EE.UU. (US)	109
4	Japón (JP)	52
5	Corea (KR)	33
6	Alemania (DE)	20
7	Taiwan (TW)	14
8	Patentes Europeas (EP)	11
9	Francia (FR)	10
10	Rusia (RU)	7

En los apartados posteriores se recoge una selección de los documentos de patentes identificados en el trimestre analizado, así como un resumen de las noticias más significativas, clasificados por tecnologías.

Solicitudes de Patentes Publicadas

Los datos que aparecen en la tabla corresponden a una selección de las solicitudes de patentes publicadas por primera vez durante el trimestre analizado.

Si desea ampliar información sobre alguna de las patentes aquí listadas, pulse sobre el número de patente correspondiente para acceder a la información online relativa a la misma.

COMBUSTIÓN DIRECTA

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
US2011120140	ZILKHA BIOMASS POWER LLC	EE.UU.	A cyclonic combustor comprising a combustion liner forming a combustion chamber having a generally cylindrical shape, a biomass feed inlet for receiving biomass particles under pressure, wherein the biomass feed inlet is formed so that the biomass particles are introduced into the ignition zone of the combustion chamber with a tangential component relative to the longitudinal axis of the combustion liner, and a plurality of air tuyeres formed through the combustion liner for receiving compressed air, wherein the plurality of air tuyeres are arranged to introduce the compressed air into the combustion chamber with a tangential component relative to the longitudinal axis of the combustion liner. A direct-fired biomass-fueled pressurized gas turbine system comprising a pressurized feed system, the cyclonic combustor, and a gas turbine. Methods of operating a cyclonic combustor and methods for direct firing a gas turbine.
WO2011059230	INTER BIO CO	Corea	The present invention relates to a burner for a boiler using solid fuel such as wood pellets or the like, which are in the spotlight as biomass energy, and realizes a new combustion type, wherein fuel is transported using a screw circulating water inside and burnt in a predetermined section supplied with air (oxygen) by a blower. Therefore, it is possible to secure the durability of the screw even at the high temperature generated during the combustion, and complete simultaneous treatment of sludge and ashes. In addition, it is possible to largely reduce the size of the boiler using solid fuels, thereby simplifying the entire structure of the boiler, while promoting the reduction of manufacturing cost.
US2011114074	UNIV COLORADO STATE RES FOUND	EE.UU.	A combustion chamber may include an upper and a lower chamber. The chambers may be separable to aid in loading fuel and removing spent fuel. The cross-section of the upper combustion chamber may be less than the cross-section of the lower section. Charcoal or other biomass fuel may be added into the lower combustion chamber and may be supported by a grate. Oxygen may be fed into the combustion chamber through a plurality of apertures that may be substantially shielded from direct line of site of the fuel bed. The upper combustion chamber may further include an annular constriction, to aid in constricting the view factor between the cooking vessel and the fuel bed. The constriction may also aid in radiating energy back to the fuel bed.
WO2011053652	AIR BURNERS LLC	EE.UU.	A portable air curtain incinerator for burning biomass, such as cleared logs and vegetation, is equipped with heat recovery panels along at least one of the sidewalls of the incinerator's firebox, and a heat transfer medium is cycled through the heat recovery panels and expanded to its gaseous phase by heat released during incineration of the biomass. The gaseous medium is directed to drive the turbine of a generator to generate electricity. The heat transfer medium is condensed, preferably using a local source of cooling water, and the cycle is repeated. The air curtain incinerator may include its own generator, or multiple incinerators may be coupled to a single shared generator.

COMBUSTIÓN DIRECTA

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011045473	TEKNOLOGIAN TUTKIMUSKESKUS VTT	Finlandia	The invention relates to a process and apparatus for producing a biocarbon product from bio-based raw stock. According to the invention the bio-based raw stock is sorted by removing in the raw stock the fraction that is undesired in terms of the production of biocarbon from the desired fraction of the raw stock which is used for the production of biocarbon, the desired fraction of the raw stock is fed to a fluidized-bed reactor, the undesired fraction of the raw stock is fed to a combustion boiler disposed in connection with the fluidized-bed reactor in order to produce energy fractions, a heat transfer material to be used in the fluidized-bed reactor is warmed up in the combustion boiler and the warmed up heat transfer material is led to the fluidized- bed reactor, the bio-based raw stock; is heated in the fluidized-bed reactor in oxygen-free conditions to a temperature of 220 to 350 DEG C in the presence of the heat transfer material in order to form a solid biocarbon product, and the heat transfer material is circulated from the fluidized-bed reactor to the combustion boiler in order to warm up the heat transfer material.
WO2011045047	CONPOWER ENERGIEANLAGEN GMBH & CO KG	Alemania	The invention relates to an (O) RC-method for utilising the waste heat from biomass combustion for generating electricity as well as to a corresponding system, according to the preamble of patent claims 1 and 6. In order to achieve an improvement of the overall energy efficiency such that the overall efficiency of the biomass utilisation is enhanced, it is proposed, according to the invention, to design the evaporator so as to correspond exactly to the targeted difference in enthalpy on the boiling curve pre and post evaporation, by means of connecting to this end a controllable heat exchanger upstream of the evaporator, which heat exchanger is regulated to the difference in enthalpy between the pump and the entrance into the boiling curve of the evaporator.
EP2302303	POWER SYSTEMS S.R.L	Italia	This invention relates to a hearth for solid fuel stoves comprising a combustion chamber defined within an enclosure which is open at the top and is provided with a device having a moving transfer unit for the removal of combustion wastes and ash. According to the invention, the device is directly and at least partly located within combustion chamber so that the moving transfer unit penetrates at least partly within the said combustion chamber and removes the combustion wastes and ash directly from the combustion bed. This invention may advantageously be applied to both pellet stoves and biomass stoves.

GASIFICACIÓN

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011067552	CHALABI RIFAT AL	Gran Bretaña	The invention provides an apparatus for processing material such as organically coated waste and organic materials including biomass, industrial waste, municipal solid waste and sludge, comprising a processing chamber for processing said material at an elevated temperature to produce syngas and a combustion chamber having at least one burner therein for combusting syngas released by processing of said material. A conduit means is provided between said combustion chamber and said processing chamber for carrying hot exhaust gasses from the combustion chamber to said processing chamber and at last one mirror is arranged to reflect and concentrate sunlight thereby to cause the temperature within said processing chamber to be raised. The apparatus also includes a syngas reservoir. A storage conduit is provided for carrying syngas into said syngas reservoir and a syngas feed line is provided for feeding syngas from said reservoir to said combustion chamber.
WO2011063971	CHOREN IND GMBH	Alemania	The present invention relates to a device for generating a synthesis gas (SG) from biomass (BM) by entrained-flow gasification. The device comprises a processing unit in which the biomass (BM) is fed to a coarse comminuting device which is connected downstream via a first sluice to a pressurized carbonization unit for the hydrothermal generation of carbonization coal (KK) from the biomass (BM). The carbonization unit comprises at least one preheating device and a carbonization reactor that is arranged downstream of the preheating device and is connected downstream via a second sluice to at least one solid-liquid separation device for providing a fuel. Downstream of the solid-liquid separation device, a drying device for drying the fuel is provided, downstream of which is connected a comminution device for comminuting the fuel into a combustible dust (BS) having particle sizes in a range from 55 [mu]m to 500 [mu]m. The device further comprises a transfer device for transferring the fuel into an entrained-flow gasification unit, in such a manner that the processing unit is coupled to the entrained-flow gasification unit. In addition, the present invention discloses a method for generating a synthesis gas (SG) from biomass (BM) by entrained-flow gasification, using a device according to the invention.
WO2011056142	MEVA INNOVATION AB	Suecia	Disclosed area process and a system for gasifying biomass to obtain a combustible gas for combustion in an engine. Further, a method and a purification system for removing tar components from a combustible gas having a temperature above its dew-point are disclosed.
US2011104770	TOBEY RICHARD E	EE.UU.	Ethanol and other liquid products are produced from biomass using gasification of the biomass to produce a syngas containing CO_2, CO, H_2 and sulfur or sulfur compounds that passes the syngas to a fermentation step for the conversion of the CO and CO_2 and H_2 to ethanol. Sulfur and sulfur compounds in the syngas are used to satisfy sulfur demanded by bacteria in the fermentation step. A sulfur control additive is added to the gasification to control syngas sulfur and sulfur compounds at a desired concentration to meet bacteria sulfur demand.
WO2011052265	MITSUBISHI HEAVY IND LTD	Japón	Disclosed is a biomass gasification system provided with a biomass gasification furnace for gasifying biomass, a dust removal device for removing gasified char present in the gasified gas generated in the biomass gasification furnace, and a gas purifying means for purifying the gasified gas to form purified gas, the gasified char being removed from the gasified gas by means of the dust removal device, wherein the gas purification means has: a gasified gas introduction unit in which porous particles having fine pores and biomass in said particles are held, and which introduces the gasified gas to the gas purifying means, the gasified char being removed from the gasified gas by means of the dust removal device; and a purified gas exhaust unit which exhausts the purified gas which was purified by passing through the porous particles having fine pores and biomass.

GASIFICACIÓN

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
US2011107662	RANGE FUELS INC	EE.UU.	The present invention provides a process for producing gasoline components from syngas. Syngas is converted to one or more of methanol, ethanol, mixed alcohols, and dimethyl ether, followed by various combinations of separations and reactions to produce gasoline components with oxygenates, such as alcohols. The syngas is preferably derived from biomass or another renewable carbon-containing feedstock, thereby providing a biorefining process for the production of renewable gasoline.
US2011094158	PACKER ENG INC	EE.UU.	A system and method capable of efficient production of synthesis gas from biomass materials in a manner which can be scaled to relatively large throughput capacities. the system is operable to compact a loose biomass material and simultaneously introduce the compacted biomass material into entrances of internal passages of multiple parallel reactors, heat the compacted biomass material within the reactors to a temperature at which organic molecules within the compacted biomass material break down to form ash and gases comprising carbon monoxide and hydrogen gases, inhibit combustion of the compacted biomass material when heated within the internal passages of the reactors, conduct the carbon monoxide and hydrogen gases through the reactors in a direction opposite the movement of the compacted biomass through the reactors, and remove the ash from the reactor.
US2011086927	CORTRIGHT RANDY D	EE.UU.	A low-temperature catalytic process for converting biomass (preferably glycerol recovered from the fabrication of bio-diesel) to synthesis gas (i.e., H_2/CO gas mixture) in an endothermic gasification reaction is described. The synthesis gas is used in exothermic carbon-carbon bond-forming reactions, such as Fischer-Tropsch, methanol, or dimethylether syntheses. The heat from the exothermic carbon-carbon bond-forming reaction is integrated with the endothermic gasification reaction, thus providing an energy-efficient route for producing fuels and chemicals from renewable biomass resources.
US2011085966	AIR LIQUIDE PROCESS & CONSTRUCTION INC	EE.UU.	A method of high hydrogen recovery from syngas from a gasifier is provided. This method includes providing a syngas stream from the gasifier to first hydrogen separation device, wherein the first hydrogen separation device is a pressure swing adsorption device, thereby producing a first high purity hydrogen stream and a tailgas stream. This method also includes increasing the pressure of the tailgas stream in a first compressor; thereby producing a pressurized tailgas stream. This method also includes providing the pressurized tailgas stream to a second hydrogen separation device, thereby producing a second high purity hydrogen stream and a residue stream. This method also includes directing the residue stream to an auxiliary boiler, and combining the first high purity hydrogen product stream and the second high purity hydrogen product stream, thereby producing a high purity hydrogen product stream.
WO2011037463	STICHTING ENERGIE	Holanda	Method and system for gasifying biomass. Tar loaded gas from the reactor for gasifying the biomass is subjected to a saturation and absorption treatment with a first and second fluid respectively. The first fluid comprises aromatic hydrocarbons whilst the second fluid comprises linear hydrocarbons. Tars received in the aromatic fluid is entered together with such fluid in a separation column. Separation is effected based on evaporation temperature and the lighter fraction is returned to the inflow of the saturation separator. The heavier fractions are either discharged or sent back to the biomass reactor. An intermediate buffer vessel can be provided between the discharge of the saturation cleaner and the separator.

GASIFICACIÓN

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011055296	T SRL AG	Italia	The invention relates to a plant for the production of gas from biomass, comprising a gasifier of the open- core downdraft type and an apparatus for cleaning the gas G. The apparatus comprises: - an inlet line for the gas to be cleaned; - an evaporative cooler having: means for spraying an aqueous mixture MA into the gas; a basin for containing the condensed mixture; and a first bleed pipe for removing the pollutants; - a condensing wet electrostatic precipitator having: means for cooling the walls in contact with the gas; a tank for collecting the mixture condensed by cooling; a recirculation pipe for removing the mixture and conveying it to the evaporative cooler; a second bleed pipe for removing the pollutants from the tank; and a discharge pipe for removing the excess aqueous mixture; - an outlet line for conveying the flow of cleaned gas G to an external utilization unit. The invention also relates to a method for treating the gas.
US2011088320	DIETENBERGER MARK A	EE.UU.	Disclosed are a method and a corresponding apparatus for converting a biomass reactant into synthesis gas. The method includes the steps of (1) heating biomass in a first molten liquid bath at a first temperature, wherein the first temperature is at least about 100 DEG C., but less than the decomposition temperature of the biomass, wherein gas comprising water is evaporated and air is pressed from the biomass, thereby yielding dried biomass with minimal air content. (2) Recapturing the moisture evaporated from the biomass in step 1 for use in the process gas. (3) Heating the dried biomass in a second molten liquid bath at a second temperature, wherein the second temperature is sufficiently high to cause flash pyrolysis of the dried biomass, thereby yielding product gases, tar, and char. (4) Inserting recaptured steam into the process gas, which may optionally include external natural gas or hydrogen gas or recycled syngas for mixing and reforming with tar and non-condensable gases. (5) Further reacting the product gases, tar, and char with the process gas within a third molten liquid bath at a third temperature which is equal to or greater than the second temperature within the second molten liquid bath, thereby yielding high quality and relatively clean synthesis gas after a relatively long residence time needed for char gasification. A portion of the synthesis gas so formed is combusted to heat the first, second, and third molten liquid baths, unless external natural or hydrogen gas is available for this use.

PIRÓLISIS

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011041881	SOUTHERN BIOMASS LLC	EE.UU.	A torrefied biomass product impregnated, treated with, or otherwise including a bio-liquid selected from an animal fat and plant oil. Preferably the torrefied biomass product has at least 1% wet weight of the bio-liquid, and more preferably between 4% to 12% wet weight of the bio-liquid. The bio-liquid is selected from plant oil and animal fat, preferably, vegetable oil, such as, canola or soybean oil. The biomass material is, preferably, a hardwood, softwood or wood bark.
WO2011041756	UNIV MISSISSIPPI STATE	EE.UU.	The device and method of this invention provides a means to increase anhydrosugars yield during pyrolysis of biomass. This increase is achieved by injection of a liquid or gas into the vapor stream of any pyrolysis reactor prior to the reactor condensers. A second novel feature of our technology is the utilization of sonication, microwave excitation or shear mixing of the biomass to increase the acid catalyst rate for demineralization or removal of hemicellulose prior to pyrolysis. The increased reactivity of these treatments reduces reaction time as well as the required amount of catalyst to less than half of that otherwise required. A fractional condensation system employed by our pyrolysis reactor is also a novel element of our technology. This system condenses biooil pyrolysis vapors to various desired fractions by differential temperature manipulation of individual condensers comprising a condenser chain.
WO2011060556	G4 INSIGHTS INC	Canadá	Disclosed embodiments provide a system and method for producing hydrocarbons from biomass. Certain embodiments of the method are particularly useful for producing substitute natural gas from forestry residues. Certain disclosed embodiments of the method convert a biomass feedstock into a product hydrocarbon by hydropyrolysis and catalytic conversion of the resulting pyrolysis gas to the product hydrocarbon and carbon dioxide in the presence of hydrogen and steam over a CO_2 sorbent while simultaneously generating the required hydrogen by reaction with steam. A gas separation means is provided to purify product methane while forcing recycle of internally generated hydrogen so as to obtain high conversion of the biomass feedstock to the desired hydrocarbon product. While methane is a preferred hydrocarbon product, liquid hydrocarbon products can also be delivered.
EP2319899	ENRESTEC INC	Taiwan	A continuous pyrolysis system, comprising a reactor with a charge port, a discharge port and a first gas outlet and a first axial transporting structure installed therein; a hest-source generator for supplying heat necessary for carrying out a pyrolysis reaction in the reactor; a solid-product reformer for performing a reforming process for the solid product of the pyrolysis reaction, with a first solid product inlet, a first solid product outlet and a second gas outlet, and a second axial transporting structure installed therein, wherein the first solid product inlet is communicated with the discharge port of the reactor; and a gas-barrier component for preventing the gas product of the pyrolysis reaction from entering the solid product reformer and transporting the solid product of the pyrolysis reaction into the solid-product reformer, wherein the gas barrier component is installed in a channel communicating the first solid product inlet and the discharge port of the reactor.
US2011089014	NOTO VINCENT H	EE.UU.	Useful byproducts are recovered through the pyrolytic processing of biomass material such as vegetation, paper, or worn tires. The process is conducted in a sealed enclosure under vacuum or other controlled atmosphere. The biomass material is ablated and burned by crunching between counter-rotating rollers rotated at different speeds whose inner walls have been exposed to a highly heated fluid. The biomass material is preheated by injecting into the feeding duct super-heated dry steam. A condenser within the enclosure reduces resulting vapors into oils that can be drained from the enclosure pan. Solid combustion residue is abstracted from the enclosure by an Archimedes screw.

TRANSFORMACIÓN DE BIOMASA DE ORIGEN VEGETAL MEDIANTE TERMÓLISIS

El Consejo Superior de Investigaciones Científicas (CSIC) ha firmado un contrato de I+D con la empresa aragonesa UxúeBioenergía y Renovables S.A. para llevar a cabo un proyecto de investigación en biomasa vegetal bajo el nombre de "Procesos de termólisis y secado de biomasa agrícola y forestal" (VULCANO).

El objetivo de este proyecto es estudiar la transformación de biomasa de origen vegetal en energía eléctrica y biocombustibles mediante termólisis. Para ello, se construirá una planta de producción de energía eléctrica y biomasa, que tomará como base los conocimientos previos desarrollados y patentados en el Instituto de Carboquímica del CSIC, ubicado en Zaragoza.

La nueva planta será diseñada para que posea autonomía energética y pueda operar de forma estable y segura durante al menos 1000 horas de operación acumuladas.

PRODUCCIÓN DE BIOCOMBUSTIBLES MEDIANTE PIRÓLISIS DE RESIDUOS DE PIEL CURTIDA

El Instituto de la Mediana y Pequeña Industria Valenciana (IMPIVA) está respaldando la investigación que está desarrollando el Instituto Tecnológico del Calzado (INESCOP) junto con el departamento de Ingeniería Química de la Universidad de Alicante sobre una técnica de pirólisis tipo flash que aplicada a los residuos de piel curtida generados por las tenerías y las industrias de calzado los convierte en bioaceites aptos como combustibles alternativos de diferentes procesos industriales.

Con esta nueva técnica de aprovechamiento de residuos, se contribuye a mejorar el abastecimiento energético de sectores industriales de elevado consumo, como el cerámico o el del cemento.

En la actualidad, en mayor parte de los casos, los residuos de piel se almacenan en vertederos junto con el resto de los residuos urbanos, generándose lixiviados con un elevado porcentaje de contaminantes peligrosos como el cromo (VI).

PROCESO DE TORREFACCIÓN DE BIOMASA FORESTAL Y AGRÍCOLA

El grupo Lantec llegó a un acuerdo con la compañía francesa Thermya para adquirir la licencia de explotación de la tecnología *Torspyd*, que permitirá la construcción de plantas de torrefacción de biomasa forestal y agrícola en España. La primera planta se construirá en Urnieta (Guipúzcoa).

Diversos estudios de investigación muestran que la biomasa torrefactada tiene menor contenido de humedad y presenta mayor estabilidad y mayor densidad energética, lo que permite reducir costes de almacenamiento y transporte. Según investigaciones de la Universidad de Carolina del Norte (EE.UU.), la madera torrefactada es más ligera que la materia prima de la que procede y conserva el 80% de la energía en un tercio del peso.

El proceso básico de torrefacción consiste en un calentamiento lento y prolongado de la biomasa en ausencia de oxígeno hasta temperaturas finales en el rango de 230-300ºC. El combustible generado tiene un coste superior al de la biomasa de partida, pero puede resultar rentable en los casos de consumos elevados de biomasa que precisen transportes a largas distancias. También pueden ser rentables en aplicaciones que requieran la pulverización fina de la biomasa, como la co-combustión en centrales térmicas de carbón, la producción de biocarburantes de segunda generación y la fabricación de pellets para exportación.

DIGESTIÓN ANAERÓBICA

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011066393	GHD, INC	EE.UU.	The invention relates to methods and apparatuses for producing Class A biosolids. In yet another embodiment, the invention relates to a method comprising digesting waste material by anaerobic digestion, and yielding Class A biosolids. In still yet another embodiment, the invention relates to a system for anaerobic digestion of waste material to produce Class A biosolids. In still yet another embodiment, the invention relates to a system for anaerobic digestion of waste material comprising a mixing chamber, a digester, a heating pit, and an effluent pit.
FR2952369	OTV, SA	Francia	The invention relates to a device and a method for anaerobic treatment of wastewater in a biological reactor involving at least one stabilised bacteria species including the following steps: measuring a concentration, in an area linked to the reactor, of a reaction product inhibiting said at least one bacteria species; extracting a fraction of the contents of the reactor when said concentration exceeds a predefined threshold; separating said fraction into first and second sub-fractions, the first sub-fraction being depleted of said reaction product; and recirculating the first sub-fraction in the reactor.
US2011083971	WORLD HYDROGEN ENERGY LLC	EE.UU.	A process for the production of hydrogen from anaerobically decomposed organic materials by applying an electric potential to the anaerobically decomposed organic materials, including landfill materials and sewage, to form hydrogen, and for decreasing the time required to treat these anaerobically decomposed organic materials. The organic materials decompose to volatile acids such as acetic acid, which may be hydrolyzed by electric current to form hydrogen. The process may be continuously run in sewage digestion tanks with the continuous feed of sewage, at landfill sites, or at any site having a supply of anaerobically decomposed or decomposable organic materials.
WO2011054298	HUGE ASIA, LTD	China	A method for integratedly treating domestic wastewater and organic garbage comprises steps of multiphase separation, fermentation, biogas production and biological denitrification and dephosphorization, and it can translate domestic wastewater and organic garbage into clear water, biogas, organic fertilizer and sand residue, which can be discharged directly. An apparatus for integratedly treating domestic wastewater and organic garbage is also provided, which comprises a multiphase separation device, a fermentation device, a biogas production device and a biological denitrification and dephosphorization device. A multiphase separation device for separating domestic wastewater is also provided, which comprises a domestic wastewater inlet, a sand separation chamber, a sand outlet, an automatic separation screen device comprised of an abnormity screen and a separation rake, a screen isolate outlet, a floating liquid chamber and a supernatant chamber. A method for separating domestic wastewater using the multiphase separation device is also provided. Domestic wastewater and organic garbage can be treated, simultaneously, so as to realize an object of minimum pollutant discharge.
US2011084020	OTT CHRISTOPHER	EE.UU.	A method for removing methane from biogas is described. The method includes: (i) receiving biogas including methane and other components into a first tank; (ii) receiving water into the first tank; (iii) contacting the biogas with the water inside the first tank; (iv) dispensing methane gas from an outlet of the first tank; and (v) producing from the tank an effluent stream that includes other components of the biogas.

DIGESTIÓN ANAERÓBICA

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011047372	UNIV WASHINGTON STATE RES FDN	EE.UU.	Systems and methods for the treatment of lipid-extracted algae biomass and recycling nutrients are provided. The lipid-extracted algae biomass is hydrolyzed prior to anaerobic digestion; and the products generated by anaerobic digestion are further processed to yield by-products that are of use either for external use or as process inputs to carry out specific steps within an integrated algal growth and anaerobic digestion process designed to minimize economic costs, required costly inputs while improving upon system capabilities.
WO2011036548	ACEA PINEROLESE IND S P A	Italia	The invention relates to a system for preparing a mixture of organic fraction of urban solid waste and water to be fed to an anaerobic digestion process, the system comprising a first separation stage for separating a first heavy fraction of said urban solid waste and a second separation stage, wherein the second separation stage comprises first and second separation means for said urban solid waste, the first means being configured to remove a light fraction of the urban solid waste, the light fraction at least partially emerging from the free surface in the second stage, the second means comprising an outlet duct for the mixture from the second stage; the outlet duct having a mouth arranged below the free surface in the second stage and a mouth arranged at a level between the free surface in the second stage and the mouth.
WO2011036675	CHANDRATRE MAITHILEE DINESH	India	The present invention relates to a Method and system for completion of Ecological cycle of Biomass, applying Nature to Nature (N2N) theory, by biological treatment of any biodegradable waste or organic waste, including biodegradable part of MSW, to produce rich biological fertilizer as end product, methane and many useful byproducts using natural processes and natural/organic materials within a very short time span. Thus, whatever is taken from nature is returned back to the nature in natural time span called as N2N Theory.
US2011065166	BIOGAS & ELECTRIC	EE.UU.	Provided herein are methods, devices and systems comprising a reactor that is operatively connected to: (a) a biogas production unit for converting waste to a biogas stream; and (b) an engine that utilizes the biogas stream from the biogas producing unit to produce energy and an engine exhaust.
WO2011028163	NOREN FREDRIK	Suecia	The invention relates to a method for production of biogas, comprising anaerobic digestion of water living organisms from the group Ascidiacea. The invention also relates to culture and harvest of ascidians before anaerobic digestion. Further comprised is an integrated culture of ascidians and macroalgae before anaerobic digestion. The invention also comprises utilization of solid and fluid digestate from the anaerobic digestion for production of fertilizer. The invention also comprises a method for artificial seeding of ascidians in larval stage and anaerobically digested biomass obtained by anaerobic digestion of ascidians.

FERMENTACIÓN DE AZÚCARES

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011067960	BIO ENERGY CORP	Japón	Disclosed is a method for producing ethanol, which comprises: a step in which a cellulose material is subjected to a hot water treatment and an ammonia treatment, thereby obtaining a fermentation substrate; and a step in which the fermentation substrate is made to react with yeast, thereby producing ethanol. Also disclosed is a method for producing a fermentation substrate that is used for the ethanol production by yeast, said method comprising a step in which a cellulose material is subjected to a hot water treatment and an ammonia treatment, thereby obtaining a fermentation substrate. A fermentation substrate obtained by this method is capable of enhancing the ethanol production by yeast.
WO2011065539	NAT UNIVERSITY CORP KOBE UNIVERSITY	Japón	Disclosed is a process which enables the production of ethanol from a glycosylated biomass with high efficiency even when a fermentation inhibiting substance is present in the glycosylated biomass. Specifically disclosed is a process for producing ethanol from a biomass, which comprises the steps of: mixing xylose-utilizing yeast that has been so transformed as to over-express at least one gene for a metabolism enzyme involved in a pentose phosphate pathway with a glycosylated biomass; and culturing the mixture.
WO2011066318	ANITOX CORP	EE.UU.	A high yield method for fermenting carbohydrate to ethanol, comprising a) treating carbohydrate with a composition containing 10 - 90 wt% of an aldehyde selected from the group consisting of formaldehyde, para-formaldehyde, glutaraldhyde and mixtures thereof, 1 - 50 wt% of a surfactant having an I JLB from 4 to 18,0 - 20 wt% of an antimicrobial terpene, or essential oils, 1 - 50 wt% of organic acids selected from C1-24 fatty acids, their salts, and glyceride esters thereof, and 1 - 50 wt% water, b) fermenting said carbohydrate in the presence of yeast in a fermentation broth, and c) isolating ethanol in a higher yield than would be obtained without step a).
US2011136194	ARISDYNE SYSTEMS INC	EE.UU.	A process for increasing ethanol yield from grain comprising mixing grain, water and enzyme to for a grain-based liquid medium. The grain-based liquid medium is passed through a cavitation device at a velocity and pressure capable of generating a cavitation activation energy of at least 0.4 kJ per kilogram of grain-based liquid medium to enhance the activity of the enzyme and increase ethanol yield.
WO2011066457	CODEXIS INC	EE.UU.	The invention relates to recombinant expression of a variant form of a fungal C1 strain ss-glucosidase. The invention also relates to the generation of fermentable sugars from biomass and the production of biofuels by fermentation of the sugars using genetically modified organisms expressing the ss-glucosidase variant. The invention provides methods for producing a fermentable sugar, such as glucose, from cellobiose by contacting cellobiose with a recombinant ss-glucosidase variant protein, such as a variant protein secreted by a recombinant host cell into culture medium. Methods of the invention may be used for conversion of a biomass substrate to a fermentable sugar, and ultimately to ethanol or other biofuel.
WO2011063402	BUTAMAX TM ADVANCED BIOFUELS LLC	EE.UU.	A method is provided for producing butanol through microbial fermentation, in which the butanol product is removed during the fermentation by extraction into a water-immiscible organic extractant in the presence of at least one osmolyte at a concentration at least sufficient to increase the butanol partition coefficient relative to that in the presence of the osmolyte concentration of the basal fermentation medium and of an optional fermentable carbon source. The osmolyte may comprise a monosaccharide, a disaccharide, glycerol, sugarcane juice, molasses, polyethylene glycol, dextran, high fructose corn syrup, corn mash, starch, cellulose, and combinations thereof. Also provided is a method and composition for recovering butanol from a fermentation medium.

FERMENTACIÓN DE AZÚCARES

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011061400	VALTION TEKNILLINEN	Finlandia	The present invention relates to a method of fractionating lignocellulosic biomass into at least one cellulose rich solid fraction and at least one liquid fraction, wherein an alkaline agent and water are added to the biomass to form a mixture and the biomass is contacted in the mixture with an oxidizing agent until most of the lignin is solubilised to produce a solid fraction comprising a cellulosic material having a reduced content of lignin and a liquid fraction comprising dissolved lignin. The method of invention is particularly useful for processing and pre-treating lignocellulose containing biomass e.g. for the production of chemicals and for other non- fibrous applications.
WO2011057413	FPINNOVATIONS	Canadá	A fractionation process for producing value-added products from a lignocellulosic biomass, comprises: a) mechanically refining the lignocellulosic biomass under mild refining conditions to form a refined biomass pulp with enhanced susceptibility to separation of hemicellulose, cellulose and lignin, and enhanced digestibility of carbohydrates in hydrolysis b) separating hemicellulose and sulfur- free high-quality lignin from cellulose in the refined biomass, and, optionally c) producing various bioproducts from the above said process.
WO2011053965	HERCULES INC	EE.UU.	In this invention, a process for producing fermentable sugars derivable from biomass that contains polysaccharide, such as cellulose, which has been made increasingly accessible as a substrate for enzymatic degradation or other methods of depolymerization. The process of the present invention increases accessibility of polysaccharides, typically present in biomass and produces polysaccharides with increased accessibility. The polysaccharides with increased accessibility may be subsequently saccharified to yield fermentable sugars. These fermentable sugars are subsequently able to be fermented to produce various target chemicals, such as alcohols, aldehydes, ketones or acids.
WO2011055178	LINDE AG	Alemania	Methods and apparatus for improving the fermentation process by controlling the temperature of the fermentation tanks. Waste byproduct carbon dioxide from the fermentation process is recycled as liquid carbon dioxide and used as a coolant medium for the fermentation process. These methods and apparatus are particularly useful for maintaining temperatures of the fermentation process when applied to production of green ethanol from sugarcane.
US2011104775	HSU TENG-CHIEH	Taiwan	The present disclosure is related to a method for increasing the ethanol concentration from the conversion of lignocellulose. The pretreated solid residues are mixed with ethanol-containing broth from the fermentation of xylose hydrolysate by Pichia stipitis and then are performed under the process of simultaneous saccharification and fermentation (SSF) with Sacharomyces cerevisiae and cellulase for converting cellulose to ethanol. The final ethanol concentration in broth as well as the ethanol productivity is increased at least 1.8 times in comparison of conventional process for lignocellulosic ethanol production.
CA2719280	JOHNSON ERIN	Canadá	A novel isolated Pichia stipitis strain is provided. The strain is capable of fermenting at least a pentose sugar in the presence of one or more inhibitory substances to produce ethanol. A method of utilizing the strain to produce ethanol is also provided.

FERMENTACIÓN DE AZÚCARES

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011047039	PURDUE RESEARCH FOUNDATION	EE.UU.	The disclosure describes a process for the conversion of lignocellulosic biomass to ethanol utilizing a dicarboxylic acid such as maleic acid as an enzyme mimic to hydrolyze the hemicellulose and cellulose of the biomass. Controlling the condition of the maleic acid hydrolysis can selectively hydrolyze the hemicellulose giving as a result a liquid portion rich in xylose and a solid portion rich in glucan. The glucan can be further hydrolyzed to produce a glucose containing material. The sugar materials can be fermented to produce ethanol which is recovered. The dicarboxylic acid is then recovered from the residue left after the ethanol is removed from the fermentation material, and the recovered dicarboxylic acid is recycled to the beginning of the process to treat additional lignocellulosic biomass.
US2011079219	POET RES INC	EE.UU.	A system for pre-treating biomass for the production of ethanol is provided. The system comprises a method for pre-treating biomass. The method comprises supplying biomass to a steaming bin, wherein the biomass is mixed with water, and inputting the steamed biomass to a first pretreatment reactor, wherein the steamed biomass comprises liquids and solids. The method also comprises removing a bulk of liquids from the solids and feeding the solids into a second pretreatment reactor. The method further comprises applying a pressure drop to the solids in the second pretreatment reactor, wherein the pressure drop opens up a structure of the solids, and sending the solids to a fermentation process for ethanol processing.

RENDIMIENTO DE BIOGÁS A PARTIR DE DISTINTOS RESIDUOS ORGÁNICOS Y OPTIMIZACIÓN DEL DISEÑO DE REACTORES

En la actualidad, un campo de investigación en el área de biogás va dirigido hacia la optimización de los equipos de producción y la determinación del rendimiento de biogás a partir de distintos tipos de alimentaciones. Ésta es una de las líneas de investigación que se lleva a cabo en el Laboratorio del Departamento de Termodinámica de la Facultad de Ingeniería de la Universidad Nacional del Nordeste de Argentina (UNNE).

Los ensayos se realizan utilizando dos biodigestores de carga única tipo batch de 100 y 25 litros. En cada caso, el biogás producido se acumula y mide en un gasómetro para, posteriormente, ventilarlo y quemarlo.

El proceso de medición, así como el de generación de biogás, depende de las condiciones atmosféricas y del tipo y cantidad de materia orgánica de partida. Durante el tiempo de duración del ensayo, el biogás generado se mide en continuo. En función de los resultados obtenidos en cada caso, se trata de rediseñar el digestor óptimo.

CO-DIGESTIÓN DE PURINES Y SUBPRODUCTOS AGRÍCOLAS

El equipo de investigadores del Instituto de Ciencia y Tecnología Animal de la Universidad Politécnica de Valencia ha estudiado el tratamiento conjunto de purines y subproductos agrícolas para producir biogás con el objetivo de proporcionar alternativas sostenibles de uso y aprovechamiento de los purines.

De momento, los investigadores han ensayado in vitro la combinación de purines con destríos de pimiento, tomate, melocotón y caqui para conocer su potencial para producir biogás y buscar el nivel óptimo de combinación de ambos sustratos (purines y subproductos agrícolas).

Tras un año de estudio, se ha comprobado que el pimiento aumenta en un 44% la producción de metano, respecto a la de los purines solos; el tomate la aumenta un 41%, el melocotón un 28% y, sin

embargo, con el caqui no se ha observado ninguna diferencia.

A partir de estos datos, se van a realizar pruebas en digestores a mayor escala y de manera continua, para simular el proceso real de producción de biogás combinando purines y los destríos de pimiento, tomate y melocotón. Los investigadores piensan que en un año pueden obtener resultados a escala real y podrían ya aplicarse en plantas de biogás centralizadas.

Los investigadores, junto con el Centro de Investigación y Tecnología Animal del Instituto Valenciano de Investigaciones Agrarias (IVIA), desarrollan también una línea de trabajo para introducir subproductos agrícolas como la colza, la pulpa de naranja o la cascarilla de arroz, en el pienso de los cerdos y comprobar que, además de no afectar al crecimiento del animal y otros parámetros productivos, se produce un aumento en la producción de metano a partir de los purines.

CONTROL ÓPTIMO DE LA CO-DIGESTIÓN ANAERÓBICA CON INTEGRACIÓN DE LA ECOLOGÍA MICROBIANA EN EL MODELADO Y DIAGNOSIS DEL PROCESO

El Grupo de Ingeniería Ambiental y Bioprocesos de la Universidad de Santiago de Compostela está llevando a cabo el proyecto "Control óptimo de la co-digestión anaerobia con integración de la ecología microbiana en el modelado y diagnosis del proceso" (CoMDigest). El objetivo principal del proyecto es lograr una mejora significativa en el funcionamiento de los procesos de co-digestión anaeróbica, en términos de producción y calidad de biogás, calidad del digestato, estabilidad del proceso e impactos ambientales del mismo. A pesar de que en la bibliografía existen diversos protocolos de control, la co-digestión posee características específicas que requieren del desarrollo de estrategias de control novedosas.

La primera tarea del proyecto consiste en el desarrollo de un modelo matemático del proceso de co-digestión, capaz de describir de forma precisa su dinámica. El modelo va a incorporar la muy innovadora característica de integrar información relevante de la interrelación entre la ecología microbiana y el funcionamiento del proceso. El modelo se utilizará para el desarrollo y prueba de estrategias de control óptimo en simulación. Asimismo, se definirá una serie de indicadores numéricos, heurísticos y medioambientales del sistema a utilizar en la diagnosis del proceso.

La segunda tarea persigue el objetivo de dilucidar la diversidad, funcionalidad y límites de funcionamiento óptimo de la población microbiana. Se realizarán experimentos en discontinuo y en continuo (uno y varios sustratos, perturbaciones controladas) con el fin de investigar las características y dinámica de la población microbiana. El conocimiento adquirido se combinará con mediciones físicas y químicas para crear un indicador microbiano temprano, basado en el uso de sondas FISH sencillas, de desestabilización del proceso y posibilidades de recuperación. Asimismo, se tomarán datos de plantas industriales de co-digestión, en diferentes condiciones, y se determinará su diversidad microbiana con el fin de validar las conclusiones obtenidas en laboratorio. Los resultados serán integrados en el modelo como nuevos indicadores para control.

La tercera tarea consistirá en el desarrollo y validación de estrategias de control óptimo. Se utilizará una función multiobjectivo, considerando tanto la producción de biogás como la calidad del digestato, así como los impactos ambientales globales. Se propondrán algoritmos de control dinámicos que serán probados en simulación inicialmente. Como parte fundamental de la optimización, se establecerá un sistema de diagnosis basado en los indicadores numéricos y heurísticos previos. Las estrategias de control óptimo se validarán en una planta piloto de co-digestión altamente instrumentada.

En la cuarta tarea, los resultados del proyecto CoMDigest se integrarán y se elaborará un documento de directrices que será presentado, entre otros, a empresas interesadas del sector.

La integración de microbiología molecular, modelado teórico y estrategias de control óptimo, validados a escala piloto, proporcionará un avance científico y tecnológico significativo en la co-digestión anaeróbica así como en otros bioprocesos.

AUMENTO DEL RENDIMIENTO EN LA PRODUCCIÓN DE BIOETANOL MEDIANTE LA UTILIZACIÓN DE *RHIZOPUS OLIGOSPORUS*

Un grupo de ingenieros de la *Iowa State University* de Estados Unidos ha desarrollado un innovador proceso para la producción de bioetanol. El avance ha sido posible gracias a un hongo, el *Rhizopus*

oligosporus, que permite el reciclado de distintos tipos de residuos.

En la actualidad, el nuevo proceso ha pasado de la fase de laboratorio al desarrollo en planta piloto. Este proceso, denominado *MycoMeal*, podría derivar en un futuro en la producción de un suplemento alimenticio de bajo coste para consumo humano.

En la producción de etanol, por cada galón producido, se generan cinco de vinaza. Ésta contiene elementos sólidos y otros materiales orgánicos que se eliminan por centrifugación, en algunos casos, o se secan, y venden posteriormente como alimento para ganado. El líquido restante contiene algunos sólidos, una variedad de compuestos orgánicos y enzimas. La novedad del proceso consiste en que al incorporar el *Rhizopus oligosporus* a la vinaza líquida se elimina alrededor del 60% de la materia orgánica y la mayoría de los sólidos presentes en la vinaza, permitiendo que el agua y las enzimas puedan ser recicladas e incorporadas nuevamente a la producción de etanol.

El proceso *MycoMeal* podría revolucionar la industria de los biocombustibles, estimándose un ahorro de 565 millones de euros al año para los productores de bioetanol.

DESARROLLO DE MATERIA PRIMA BIOCOMBUSTIBLE A BASE DE PASTO AGUJA BAJO EN LIGNINA MEDIANTE LA REGULACIÓN REDUCTORA DE UN GEN CLAVE DE BIOSÍNTESIS DE LA LIGNINA

Uno de los principales problemas del proceso de obtención de bioetanol a partir de biomasa lignocelulósica es la eliminación de la lignina. Para llevarla a cabo, a menudo se utilizan métodos termoquímicos que resultan costosos y de elevado consumo energético. Otro posible enfoque consistiría en actuar sobre la propia materia prima y desarrollar plantas bajas en lignina, aplicando técnicas de biología molecular. Científicos de la Fundación Samuel Roberts Noble y el Centro de Ciencias Bioenergéticas de EE.UU. trabajan en la actualidad en el desarrollo de pasto de aguja (*panicum virgatum*) bajo en lignina, estudiando la regulación reductora de un importante gen que controla la biosíntesis de la lignina en esta hierba.

El gen estudiado es el que expresa la enzima *cinamil alcohol dehidrogenasa* (CAD), que cataliza la fase final de la vía bioquímica que produce los precursores de la síntesis de la lignina. En sus investigaciones, produjeron plantas transgénicas con una construcción génica de ARNi de la CAD bajo control del promotor de la ubiquitina del maíz. Se observó que las líneas transgénicas presentaban menores niveles de expresión de la CAD, actividad enzimática reducida, menor contenido de lignina y una composición de lignina alterada. La regulación reductora del gen de la CAD hizo posible mejorar la liberación de azúcar y la digestibilidad y aumentar la eficiencia de la sacarificación, que sería útil para reducir el coste de producción de bioetanol celulósico.

TECNOLOGÍAS QUÍMICAS

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
US2011131869	GENIFUEL CORP	EE.UU.	A process for production of biofuels from algae can include cultivating an oil-producing algae by promoting sequential photoautotrophic and heterotrophic growth. The method can further include producing oil by heterotrophic growth of algae wherein the heterotrophic algae growth is achieved by introducing a sugar feed to the oil-producing algae. An algal oil can be extracted from the oil-producing algae, and can be converted to form biodiesel.
WO2011062410	KOREA ENERGY RESEARCH INST	Corea	The present invention relates to a method in which a catalytic reaction is used in order to produce hydrocarbons from renewable starting materials derived from biological organisms such as vegetable lipids, animal lipids and lipids extracted from macroalgae and microalgae, and more specifically relates to a method for selectively making a hydrocarbon, which is suitable for gasoline or diesel, by removing the oxygen contained in the starting material without consuming hydrogen. In the present invention, the production takes place by bringing the starting material into contact with hydrotalcite, which constitutes a catalyst, and thereby removing oxygen via a decarboxylation or decarbonylation reaction; and the starting material is one or more such material selected from triglycerides, fatty acids and fatty-acid derivatives obtained from a renewable source of supply originating from a biological organism.
EP2325281	SHELL INT RESEARCH	Holanda	The present invention provides a process for catalytic cracking of a pyrolysis oil derived from material comprising lignocellulose, comprising the steps of a) subjecting a feed comprising the pyrolysis oil to a hydrodeoxygenation step to obtain a product stream comprising a partially deoxygenated pyrolysis oil; b) separating the partially deoxygenated pyrolysis oil having an oxygen content of from 5 to 30 wt% from the product stream obtained in a); c) contacting the partially deoxygenated pyrolysis oil obtained in b) in the presence of a hydrocarbon feed derived from a mineral crude oil with a cracking catalyst under catalytic cracking conditions to obtain a deoxygenated and cracked product stream; and d) separating at least one product fraction from the product stream obtained in c).
WO2011057196	UNIV WAYNE STATE	EE.UU.	Mixed metal oxide catalysts (ZnO, CeO, La_2O_3, NiO, $A1_20_3$, $Si0_2$, TiO_2, Nd_2O_3, Yb_2O_3, or any combination of these) supported on zirconia (ZrO_2) or hydrous zirconia are provided. These mixed metal oxide catalysts can be prepared via coprecipitation, impregnation, or sol -gel methods from metal salt precursors with/without a Zirconium salt precursor. Metal oxides/ZrO_2 catalyzes both esterification and transesterification of oil containing free fatty acids in one batch or in single stage. In particular, these mixed metal oxides supported or added on zirconium oxide exhibit good activity and selectivity for esterification and transesterification. The low acid strength of this catalyst can avoid undesirable side reaction such as alcohol dehydration or cracking of fatty acids. Metal oxides/ZrO_2 catalysts are not sensitive to any water generated from esterification. Thus, esterification does not require a water free condition or the presence of excess methanol to occur when using the mixed metal oxide catalyst. The FAME yield obtained with metal oxides/ZrO_2 is higher than that obtained with homogeneous sulfuric acid catalyst. Metal oxides/ZrO_2 catalasts can be prepared as strong pellets and in various shapes for use directly in a flow reactor. Furthermore, the pellet has a strong resistance toward dissolution to aqueous or oil phases.

TECNOLOGÍAS QUÍMICAS

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011056982	PURDUE RESEARCH FOUNDATION	EE.UU.	The present invention provides a robust and efficient process for reducing the cloud point of biodiesel fuel in which clathrates are formed from saturated fatty acid components as solvent is evaporated from a mixture of urea, methanol and fatty acid esters. The process speed can be fast, and is governed by the speed with which urea can be brought into clathrate forming contact with the fatty acid esters in the first instance, and then by the speed that solvent can be evaporated. Advantageously, substantially all of the solvent can be evaporated as pure solvent, which enhances process efficiencies and reduces cost. Additionally, substantially all of the urea can be used to form clathrates, further maximizing process efficiency.
US2011107656	CHEVRON USA INC	EE.UU.	The present invention is directed to methods (processes) and systems for processing triglyceride-containing, biologically-derived oils to provide for base oils and transportation fuels, wherein partial oligomerization of fatty acids contained therein provide for an oligomerized mixture from which the base oils and transportation fuels can be extracted. Such methods and systems can involve an initial hydrotreating step or a direct isomerization of the oligomerized mixture.
WO2011051977	RELIANCE LIFE SCIENCES PVT LTD	India	Disclosed herein are methods and compositions related to the production and extraction of oils and biodiesel from oleaginous yeast, such as a new yeast isolate of the genus Pichia. Also disclosed herein are methods for providing fermentation conditions for the production of yeast in high density using inexpensive raw materials including crude glycerol and corn steep liquor.
US2011091945	UNIV GEORGIA	EE.UU.	The present disclosure provides methods of enhancing the biofuel potential of an algal culture, the ability of an algal culture to provide a biofuel such as a lipid or to be processed to a biofuel, the method comprising: contacting an algal culture with a composition selected to enhance the biofuel potential of an algal culture; and allowing the algal culture to incubate to the point where the potential of the algal culture to provide a biofuel product or be processed to a biofuel product is enhanced compared to when the algal culture is not in contact with the composition. The selected algal species can be a species of a genus selected from the group consisting of: Gloeocystis, Limnothrix, Scenedesmus, Chlorococcum, Chlorella, Anabaena, Chlamydomonas, Botryococcus, Cricosphaera, Spirulina, Nannochloris, Dunaliella, Phaeodactylum, Pleurochrysis, Tetraselmis, or any combination thereof, one suitable species being Chlorella sorokiniana. In some embodiments, the composition selected to enhance the biofuel potential of an algal culture can be a pesticide such as, but not limited to, malathion (2-(dimethoxyphosphinothioylthio)butanedioic acid diethyl ester).
WO2011056543	EXXONMOBIL RES & ENG CO	EE.UU.	This invention provides processes for producing fuel, particularly transportation fuel, from biological material, e.g., lipid material. One aspect of the invention involves hydroprocessing a feedstock in a hydroprocessing zone that is maintained at conditions that promote the efficiency of converting the lipid-containing feedstock into transportation fuel. Such conditions include one or more of maintaining CO content of the hydroprocessing zone at a predetermined amount and recycling or providing a hydrogen-containing gas to the hydroprocessing zone that has been treated to remove CO.

TECNOLOGÍAS QUÍMICAS

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
EP2311929	LURGI GMBH	Alemania	Processing of slightly saponifiable crude oil from plant or animal origin, comprises: (a) degumming of crude oil with the addition of an acid, carrying out partial neutralization of the acid by adding a base and separating the resulting gums and soaps by a mechanical separation process; and (b) further reducing the content of aromatic substances and free fatty acids in the oil by stripping with inert gas or water vapor and/or applying a vacuum. Processing of slightly saponifiable crude oil from plant or animal origin, comprises: (a) degumming of crude oil with the addition of an acid, carrying out partial neutralization of the acid by adding a base and separating the resulting gums and soaps by a mechanical separation process; and (b) further reducing the content of aromatic substances and free fatty acids in the oil by stripping with inert gas or water vapor and/or applying a vacuum. The degumming, partial neutralization with the base and separation of gums are carried out in a first temperature range, and the stripping and/or the vacuum treatment are carried out in a second temperature range. The distance between an upper limit of the first and a lower limit of the second temperature range is at least 100 K, and not > 220 K.
FR2951194	OLVA TECHNOLOGIES	Francia	The transesterification device comprises a frame accommodating functional modules for transesterification process, a reactor and a smelter for heating the animal fats, and a settling tank to treat the unmelted fats from the smelter. The resulting mixture in the settling tank is re-injected in the smelter. The smelter comprises a filter in its outlet for performing filtration of the resulting mixture by gravity. The reactor comprises a vent and a valve. The reactive supply is automated, and provided to the reactor depending on the temperature of the content of the reactor. The transesterification device comprises a frame accommodating functional modules for transesterification process, a reactor and a smelter for heating the animal fats, and a settling tank to treat the unmelted fats from the smelter. The resulting mixture in the settling tank is re-injected in the smelter. The smelter comprises a filter in its outlet for performing filtration of the resulting mixture by gravity. The reactor comprises a vent and a valve. The reactive supply is automated, and provided to the reactor depending on the temperature of the content of the reactor. The reactor is equipped with an overflow device. The mixture inside the reactor is produced by a movement in a closed circuit and a movement in a pump assuring the supply of melted fat in the reactor. A second reactor is used for performing pre-esterification reaction of acid for optimal operation of esterification.
US2011076207	LANXESS SYBRON CHEMICALS INC	EE.UU.	A process for monitoring the condition of a guard bed catalyst material used in an adiabatic reactor to thereby protect a primary reaction catalyst and, in particular, the present invention is intended to be applied to a guard bed used prior to the heterogeneous catalyzed esterification of free fatty acids with low molecular weight monohydric alcohols, especially methanol, to produce fatty acid alkyl esters for biodiesel production.
WO2011040798	KOREA IND TECH INST	Corea	Provided is an enzymatic biodiesel production method using carbon dioxide in the liquid state. The biodiesel production method of the present invention is a method based on the trans-esterification of oils and fats with methanol using enzymes, wherein liquid carbon dioxide is employed instead of an organic solvent to avoid methanol induced decreases in enzyme activity, and a lipase, which is active at low and room temperatures, is used as the enzyme. The biodiesel production method according to the present invention is advantageous in that it is more environmentally friendly than methods of the prior art, in which biodiesel is produced by employing an organic solvent or supercritical carbon dioxide, while at the same time being able to dramatically lower production costs for biodiesel.

TECNOLOGÍAS QUÍMICAS

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011033346	COUNCIL SCIENT IND RES	India	The present invention describes a process for converting high free fatty acid containing feed stocks(FFA 20-85 %) like palm fatty acid distillate (PFAD),restaurant grease, waste cooking oil, Soya deodistillate, acid oil, jatropha curcas oil, mohua oil etc. to biodiesel, which involves esterification of FFA containing oil with lower alcohols like methanol, ethanol, propanol etc. in presence of macro reticular and gel type acidic heterogenous resin as catalyst to bring down acid value in the range of 1-2 mgKOH/g followed by transesterification in presence of homogeneous basic catalyst metal oxides, hydroxides and alkoxides like sodium hydroxide, potassium hydroxide, sodium methoxide, potassium methoxide etc. and separation of biodiesel and glycerine.
WO2011041732	UNIV MISSISSIPPI STATE	EE.UU.	This invention relates to a method and device to produce esterified, olefinated/esterified, or thermochemolytic reacted bio-oils as fuels. The olefinated/esterified product may be utilized as a biocrude for input to a refinery, either alone or in combination with petroleum crude oils. The bio-oil esterification reaction is catalyzed by addition of alcohol and acid catalyst. The olefination/esterification reaction is catalyzed by addition of resin acid or other heterogeneous catalyst to catalyze olefins added to previously etherified bio-oil; the olefins and alcohol may also be simultaneously combined and catalyzed by addition of resin acid or other heterogeneous catalyst to produce the olefinated/esterified product.

CULTIVO DE MICROALGAS PARA LA OBTENCIÓN DE BIOCOMBUSTIBLES EN EL AEROPUERTO DE MADRID-BARAJAS

En el aeropuerto de Madrid-Barajas se ubicará, junto a la T4, una planta tecnológica de experimentación que se dedicará a investigar y mejorar las tecnologías de captura de CO_2, en este caso procedente de las instalaciones aeroportuarias. En ella se cultivarán microalgas destinadas a la producción de biomasa, a partir de la cual podrían obtenerse biocombustibles con menores costes, mejorándose la rentabilidad del proceso.

Aena ha cedido el terreno en que se ubicará la planta de experimentación gestionada por AlgaEnergy, en cuyo diseño han intervenido los científicos del Instituto de Bioquímica y Fotosíntesis Vegetal del CSIC y las Universidades de Sevilla y Almería. En el proyecto participa también Repsol, que transformará los aceites de la biomasa obtenida en biocombustible.

La plataforma tecnológica se abastecerá con agua destilada de la depuradora de Iberia en La Muñoza y utilizará CO_2 procedente de las instalaciones de Aena y del Banco de Pruebas de Motores de Iberia en el aeropuerto de Madrid-Barajas. Tanto Aena como Iberia, analizarán la utilización del biocombustible que se obtenga en sus vehículos de plataforma y aeronaves.

La experimentación en el cultivo y la producción de biomasa de microalgas en la Plataforma Tecnológica, que no requiere suelo de uso agrícola ni grandes cantidades de agua, pudiendo incluso ser éstas residuales, contribuirá a mejorar aspectos sustanciales del proceso productivo de biomasa algal rica en lípidos, de la que se deriven biocombustibles de segunda generación.

CULTIVO DE MICROALGAS EN LA CENTRAL TÉRMICA LITORAL DE CARBONERAS DE ENDESA (ALMERÍA)

ENDESA, la Universidad de Almería, el Centro Tecnológico AITEMIN y Tecnalia participan en un proyecto conjunto para estudiar la viabilidad técnica y económica de la producción de biomasa algal a partir de agua de mar y el CO_2 producido en la central térmica Litoral de Carboneras de ENDESA (Almería).

La planta piloto consta de quince calles de fotobiorreactores dotados de las estructuras metálicas que soportan las bolsas de polietileno transparente que albergan los inóculos del alga *Nannochloropsis gaditana*. Cada biorreactor posee una longitud de 12 metros y una inclinación de 60º. Los medios de cultivo manejados contienen entre 1 y 2 gramos de alga por cada litro de agua, por lo que se centrifuga la masa algal hasta alcanzar una concentración de 50-70 gramos por litro.

Actualmente, a la empresa le supone 5 euros la producción de 1 kg de algas. Para que este proceso sea rentable, el coste habría de situarse en torno a los 50 céntimos.

España, por sus condiciones climáticas, constituye una de las regiones más propicias para el desarrollo de microalgas. La planta piloto de ENDESA en Almería es la primera de estas características que se pone en marcha en Europa.

PRODUCCIÓN DE HIDROBIODIÉSEL MEDIANTE HIDROGENACIÓN DE ACEITE VEGETAL O ANIMAL

El Centro de Investigación de Cepsa ha desarrollado en las instalaciones de la refinería La Rábida de Huelva, un nuevo proceso para la producción de hidrobiodiésel a partir de aceite vegetal. La refinería onubense emprenderá la producción del nuevo biocombustible en Julio y la de Gibraltar-San Roque en Noviembre. Las investigaciones se llevan desarrollando desde el año 2007 en las refinerías de Tenerife y Huelva y responde a la necesidad de cumplir con las nuevas directivas europeas y la legislación española.

En este proceso se consigue transformar por hidrogenación el aceite vegetal en un gasóleo para automoción (hidrobiodiésel), utilizando las mismas instalaciones en las que se reduce el azufre del gasóleo (desulfuración). La capacidad inicial de producción estimada para las tres refinerías de Cepsa en España es superior a los 100000 metros cúbicos de producto al año.

Esta iniciativa, que forma parte del compromiso de Cepsa con la innovación, se considera esencial para el cumplimiento de la reciente legislación en materia de biocarburantes y, al mismo tiempo, supone una importante reducción de gases de efecto invernadero.

La nueva regulación marca como objetivo para 2020 que el 10% de la energía presente en las gasolinas y gasóleos provenga del empleo de biocarburantes. Para 2011, este objetivo de implantación progresiva a lo largo del tiempo es el 6.2%.

La investigación supone para la petrolera una herramienta de creación de valor, competitividad y crecimiento sostenible, que además contribuye a optimizar los procesos de producción, mejorar la calidad de los productos y la capacitación tecnológica de la compañía.

Boletín elaborado con la colaboración de:

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