

Balance económico de la actualización de las retribuciones a la producción eléctrica a partir de biomasa

El Balance económico de la actualización de las retribuciones a la producción eléctrica a partir de biomasa, desarrollado por Analistas Financieros Internacionales (AFI) para la Asociación de Productores de Energías Renovables, presenta un escenario económico muy favorable para esta tecnología.

Si se produce la actualización del marco retributivo propuesta por APPA Biomasa, se atraerían 3854 millones de euros en inversiones privadas que generarían 47289 puestos de trabajo. Durante la fase de operación y mantenimiento, las plantas emplearían a 2397 trabajadores y crearían 11560 puestos de trabajo en otros sectores. El saldo económico es positivo para el Estado pues las contribuciones fiscales y los ahorros superarían a las primas en más de 131,6 millones de euros anuales.

La actualización de las retribuciones permitiría pasar de un escenario de 253 MW instalados a 1031 MW en 2015. El sector atraería más de 2600 millones de euros en inversiones privadas que emplearían, durante la fase de construcción de las plantas, a cerca de 32500 trabajadores. Durante la fase de operación y mantenimiento, las plantas emplearían a cerca de 1300 trabajadores y generarían 9919 empleos en otros sectores. El Valor Añadido Bruto sería de 884 millones de euros, de los cuales 363 corresponderían a las plantas de biomasa y 521 a otros sectores de la economía. Para el Estado el saldo sería positivo pues los ahorros (por incendios evitados, por prestaciones de desempleo evitadas y por emisiones de CO₂ evitadas) y la contribución fiscal superaría a las primas en más de 72 millones de euros anuales.

En el mismo sentido, las plantas de biogás tienen un objetivo de 400 MW para el año 2020. La actualización del marco retributivo permitiría alcanzar estos objetivos, generando empleo y resolviendo problemas ambientales

con un saldo positivo para el Estado. Según el estudio, se atraerían 1254 millones de euros en inversiones privadas y, durante la fase de construcción, se crearían 14789 empleos. Una vez en marcha, las plantas generarían 2741 puestos de trabajo, 1100 en las plantas y 1641 en otros sectores. El Valor Añadido Bruto sería de 401 millones de euros, 339 por la actividad de las plantas. Al igual que en la biomasa, el saldo para el Estado sería positivo y supondría alrededor de 59 millones de euros al año.

El inventario de plantas de biomasa, biogás y pellets, elaborado por APPA Biomasa con la información aportada de las instalaciones de sus asociados, registró un total de 65 plantas con una potencia de 510 MW. La distribución por tecnologías es de 358,5 MW de biomasa, 3,7 MW de gasificación, 97,9 MW de biogás y 49,6 MW de FORSU. La actividad de las plantas de biomasa actualmente en funcionamiento genera unos beneficios económicos superiores a la retribución que reciben por las primas. Debido a este saldo positivo, el Estado ingresa anualmente cerca de 46 millones de euros más de lo que emplea en remunerar a estas plantas. (FUENTE: Asociación de Productores de Energías Renovables).

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Análisis de patentes

En el tercer trimestre de 2011 se han identificado en la base de datos WPI (*World Patent Index*) 605 nuevas familias de patentes con documentos sobre tecnologías de conversión de la biomasa para la producción de energía. El 45% de las referencias encontradas están relacionadas con tecnologías bioquímicas y el 41% con termoquímicas (Tabla 1).

TABLA 1. Número de familias de patentes clasificadas por tecnologías

TIPOS DE TECNOLOGÍAS DE CONVERSIÓN DE LA BIOMASA	3 ^{ER} TRIM. 2011
Tecnologías termoquímicas	246
Combustión directa	123
Gasificación	90
Pirólisis	33
Tecnologías bioquímicas	270
Digestión anaeróbica	146
Fermentación de azúcares	124
Tecnologías químicas (transesterificación, Fischer-Tropsch síntesis de metanol)	89
Nº TOTAL FAMILIAS DE PATENTES	605

En la Tabla 2 se muestran los países líderes. Cabe destacar que el 44% de los documentos identificados se solicitaron en China y el 28% son solicitudes internacionales de patente (PCT). A continuación, aunque en menor medida, destaca EE.UU. (18%). Durante este trimestre no se ha encontrado ningún documento de patente español.

TABLA 2. Ranking por países

	PAÍS	Nº REFERENCIAS
1	China (CN)	267
2	Patentes PCT (WO)	170
3	EE.UU. (US)	109
4	Japón (JP)	52
5	Corea (KR)	23
6	Francia (FR)	20
7	Alemania (DE)	19
8	Patentes Europeas (EP)	18
9	Holanda (NL)	6
10	Rusia (RU)	5



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.

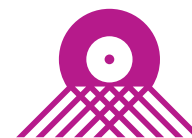
Si desea ampliar información sobre alguna de las patentes aquí listadas, pulse sobre el número de patente correspondiente para acceder a la información online relativa a la misma.

COMBUSTIÓN DIRECTA

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011106550	GLOBAL GREENSTEAM LLC	EE.UU.	BIOMASS-TO-ENERGY COMBUSTION METHOD. A solid biomass-to-energy combustion method includes introducing an oxygen containing gas into a combustion chamber of a suspension furnace to form a flow of gas through the combustion chamber; injecting a particulate solid biomass fuel into the combustion chamber through a port in the furnace wall and into the gas flow, and combusting the particulate solid biomass fuel in the gas flow to form a flame in the gas flow.
US2011214343	WECHSLER MARK	EE.UU.	DEVICE AND METHOD FOR CONVERSION OF BIOMASS TO BIOFUEL. Embodiments presented herein describe an apparatus and method to convert carbonaceous materials, particularly biomass and those biomass resources which are remotely located, into a high performance solid fuel. This method, and the apparatus described as the means to accomplish this method, provides a continuous process which can be completely powered by the energy contained in the biomass. The heat, mechanical power and electrical power are provided from the energy in the biomass, through the methods described. In this way, the apparatus is free to operate in remote locations, where no power or auxiliary fuel sources are available.
WO2011099492	BABCOCK HITACHI KK	Japón	NOX REDUCTION CATALYST FOR EXHAUST GAS OF BIOMASS COMBUSTION AND NOX REDUCTION METHOD. Conventional catalysts are rapidly deteriorated in an exhaust gas of biomass combustion. Disclosed is a NOx reduction catalyst which is not easily deteriorated even when used for the treatment of an exhaust gas that contains a potassium component at a high concentration in the combustion ash, such as an exhaust gas of biomass combustion. Also disclosed is a method capable of reducing NOx in an exhaust gas of biomass combustion with high efficiency for a long period of time by using the NOx reduction catalyst. Specifically disclosed is an exhaust gas purifying catalyst which is obtained by having titanium oxide, which has phosphate ions adsorbed on the surface, support an oxo acid or oxo acid salt of molybdenum (Mo) and/or tungsten (W) and an oxo acid salt or vanadyl salt of vanadium (V) in an amount of more than 0% by atom but 8% by atom or less, said titanium oxide with phosphate ions adsorbed on the surface being obtained by brining titanium oxide and phosphoric acid or an ammonium phosphate salt in an amount of more than 1% by weight but 15% by weight or less of the amount of titanium oxide into contact with each other in the presence of water.
US2011207062	MCALISTER TECHNOLOGIES LLC	EE.UU.	OXYGENATED FUEL. Techniques, systems, apparatus and material are disclosed for generating oxygenated fuel. In one aspect, a method of producing an oxygenated fuel from biomass waste for use in a combustion system includes dissociating the biomass waste to produce one or more carbon donors. The biomass waste produced carbon donors are reacted with an oxygen donor to produce the oxygenated fuel comprising oxygenated carbon. Reacting the carbon donors with the oxygen donors includes applying waste heat recovered from an external heat source to the reaction of carbon donors and oxygen donor. The oxygenated fuel is combusted in the combustion system.

COMBUSTIÓN DIRECTA

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011082373	PURDUE RESEARCH FOUNDATION	EE.UU.	METHODS FOR CONTROLLING COMBUSTION OF BLENDED BIOFUELS. A closed-loop control algorithm that reduces the increases in nitrogen oxides (NOx) commonly observed with biodiesel combustion while retaining particulate matter (PM) reductions with variable biodiesel blend fractions. One embodiment includes a control algorithm that is closed-loop with regards to combustible oxygen mass fraction (COMF) instead of exhaust gas recirculation (EGR) fraction. Yet another algorithm includes biodiesel blend estimation and "fuel-flexible" accommodation. A physics-based model has also been developed which predicts experimentally observed engine performance and emissions for biodiesel.
US2011140453	EIF NTE HYBRID INTELLECTUAL PROPERTY HOLDING COMPANY LLC	EE.UU.	HYBRID BIOMASS PROCESS WITH REHEAT CYCLE. Methods and systems for the generation of electrical energy through the combination of steam flows produced from different fuel sources. Steam produced from processing of a biomass fuel source is combined with steam produced from the processing of natural gas or fossil fuel and routed through a steam turbine generator to produce electrical energy. The steam is preferably reheated after partial processing in the steam turbine generator and then recirculated for further processing in the steam turbine generators. Following extraction of all available energy from the steam, the steam is condensed to water, the feedwater is then reheated and pumped to the boilers of both energy sources for conversion into steam.
DE102009057769	GOLDSCHMIDT ROLF	Alemania	Device for producing gas from e.g. pellet, for operating combustion engine utilized for driving electrical generator, has reactor with cylindrical cavity, where balls are heatable from outside of cavity by applying electromagnetic energy The device has a reactor with a cylindrical cavity, a feeding device for fresh biomass e.g. pellet, and a particle filter for used and gasified biomass. An agitating arm, an agitator shaft, a gear mechanism and two freely movable balls are arranged in the cavity, where the balls are made of metal and heatable from outside the cavity by applying electromagnetic energy. The cavity is arranged in an inclined manner with respect to a base plate (60) during an operation, such that the biomass to be gasified is moved toward a pull-off lock.



GASIFICACIÓN

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
DE102010007588	FRAUNHOFER GES FORSCHUNG	Alemania	METHOD FOR PRODUCING SYNTHESIS GAS FROM BIOMASS IN FUEL CARBURETOR, INVOLVES PERFORMING HIGH TEMPERATURE CLEANING, REFORMING HIGH TEMPERATURE TAR BY CATALYTIC CONVERTER AND REMOVING HIGH-TEMPERATURE SULFUR-AND HALOGEN BY DRY SORBENTS. The method involves gasifying biomass to combustion gas in a fuel carburetor with a gasification medium, where the combustion gas is converted into synthesis gas by gas processing. High temperature cleaning is performed by a centrifugal separator. A high temperature tar is reformed by a catalytic converter. High-temperature sulfur-and halogen are removed from sorbents by dry sorption process. The processing accomplished with gas temperature is of gaseous fuel between 700-900 degree Celsius. A high temperature fine electrostatic is precipitated in the gas processing. An independent claim is also included for a system for producing synthesis gas from biomass.
US2011203455	G D O INC	EE.UU.	MULTI-STAGE PROCESS FOR REMOVING CO ₂ RELATIVE TO HYDROGEN FROM SYNGAS STREAMS. A multi-stage membrane process for the removal of carbon dioxide from syngas streams containing at least about 5 volume percent carbon dioxide. The syngas is preferably obtained by the gasification of a biomass feedstock.
WO2011097548	TEXAS A & M UNIV SYS [EE.UU.	DEVICES AND METHODS FOR A PYROLYSIS AND GASIFICATION SYSTEM FOR BIOMASS FEEDSTOCK. Pyrolysis and gasification system and method convert a biomass feed stock to bio-char and synthesis gas. In one embodiment, the pyrolysis and gasification system includes a reactor for producing a synthesis gas and bio-char from a biomass feedstock. The system includes a flow measurement device and an air distribution system, which provides a fluidized bed in the reactor. The system also includes a cyclone assembly. The cyclone assembly removes the bio-char from the synthesis gas.
WO2011091496	SEE SOLUCOES EN E MEIO AMBIENTE LTDA	Brasil	METHOD AND SYSTEM FOR PRODUCING HYDROGEN FROM CARBON-CONTAINING RAW MATERIAL. The invention relates to a method for producing H ₂ from carbon-containing biomass. The biomass is gasified to produce a gaseous stream essentially containing carbon monoxide molecules (CO) and molecular hydrogen molecules (H ₂). These molecules of CO and H ₂ are then oxidised by oxygen carriers in the oxidised state (MeO) in order to produce a gaseous stream essentially containing CO ₂ , water vapour (H ₂ O vapour) and reduced oxygen carriers (Me). The oxygen carriers are then oxidised with water vapour, producing oxidised oxygen carriers and a gaseous stream essentially containing dihydrogen (H ₂). The invention also relates to a system comprising the means for carrying out the steps of this method.
WO2011091841	UHDE GMBH	Alemania	MASS GASIFICATION IN A FLUIDIZED BED. The invention relates to a method for the gasification of a biomass in a fluidized bed, wherein the biomass is first pre-dried and fed to the fluidized bed gasifier, the raw gas from the gasifier then charges a recycling cyclone and subsequently at least one raw gas cooler. The aim of the invention is to improve the yield of such a process and lower the initial cost. This is achieved by the fact that the dusts forming in the hot-gas filter mounted downstream of the raw gas cooler are fed back into the inlet system of the biomass.

GASIFICACIÓN

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
US2011146156	VAPO OY	Finlandia	METHOD FOR PRODUCING A FUEL BY GASIFICATION IN A HIGH-TEMPERATURE GASIFIER. A method is disclosed for producing a fuel by gasification in a high-temperature gasifier such as a dust gasifier. An essential feature of the invention is that in the method the dust gasifier is operated by way of co-feeding along with peat dust another kind of biomass dust such as ground wood-based biomass, soil biomass and/or some other similar biomass.
US2011147666	CONOCOPHILLIPS CO	EE.UU.	FLUX ADDITION AS A FILTER CONDITIONER. Improvements in a gasification system and process for gasifying carbonaceous feedstock with improved energy efficiency. Improved methods and systems for more efficient removal of particulates from a raw synthesis gas while simultaneously providing a novel mechanism for fluxing agent addition to the gasification reactor. A conditioning agent, in the form of coarse fluxing agent particles, is added to the raw synthesis gas upstream from the particle filtration unit. The conditioning agent allows more rapid turnaround of the filtration unit following filter element replacement, extend filter life, facilitates the removal of filter cake from the particle filters, and combines with removed filter cake for recycling to the gasifier. Addition of fluxing agent via this route eliminates the need to premix fluxing agent with the carbonaceous feedstock, thereby maximizing the rate of feedstock addition to the gasification reactor.
US2011150722	RANGE FUELS INC	EE.UU.	MULTI-ZONE REFORMING METHODS AND APPARATUS FOR CONVERSION OF DEVOLATILIZED BIOMASS TO SYNGAS. The present invention provides improved methods and apparatus for producing syngas from any carbon-containing feed material. In one aspect, a multi-zone reformer system is provided. A first reaction zone can reduce the presence of refractory tars, while a second reaction zone in communication with the first reaction zone can steam-reform methane and other components from the first reaction zone, to generate high-quality syngas suitable for conversion to liquid fuels, such as ethanol. Other embodiments employ a plurality of reaction zones for added system functionality.



PIRÓLISIS

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011103026	KIOR INC	EE.UU.	CO-PROCESSING OF BIOMASS AND SYNTHETIC POLYMER BASED MATERIALS IN A PYROLYSIS CONVERSION PROCESS. Disclosed is a process for biomass conversion which includes co-processing the biomass with thermoplastic and non-thermoplastic polymer based materials in a catalytic pyrolysis reactor to convert such to liquid hydrocarbons; wherein hydrogen atoms originating with the polymer materials can remove oxygen from oxygenated hydrocarbons produced in the conversion of the biomass in the reactor.
WO2011096912	KIOR INC	EE.UU.	TWO-STEP PROCESS FOR PRODUCING HIGH YIELDS OF OIL FROM BIOMASS. A process is disclosed for preparing a bio-oil having a Total Acid number ("TAN") of less than 10. The process comprises the steps of: (i) subjecting the solid biomass material to a catalytic pyrolysis process whereby a bio-oil having a TAN of less than 60 and greater than 10 is produced; and (ii) subjecting the bio-oil obtained in step (i) to an acid removal step. Significant TAN gains can be made by separating the hydrophobic phase of the bio-oil from the aqueous phase. Each phase can be subjected to a removal of acidic components by physical adsorption, chemisorption, extraction, neutralization, or chemical conversion.
US2011184215	CONOCOPHILLIPS COMPANY IP SERVICES GROUP	EE.UU.	BIOMASS PYROLYSIS IN REFINERY FEEDSTOCK. This invention relates to biomass pyrolysis through the use of a hot liquid refinery feedstock as a heat transfer medium, preferably a vacuum gas oil feedstock.
US2011179703	UNIV AUBURN	EE.UU.	BIOMASS TO BIOCHAR CONVERSION IN SUBCRITICAL WATER. The present invention relates to a method for conversion of biomass to biochar in subcritical water at 230-350 DEG C. and 500-3000 psi. Under subcritical water conditions, biomass readily converts into biochar, biocrude, and some gases. In this invention, yield of biochar is significantly improved by recycling of biocrude. The process can produce hydrophobic biochar that has at least 70 wt % (dry basis) carbon as opposed to ~25 wt % carbon in hydrophilic biomass, and has a heating value of about 29 MJ/kg (HHV-dry basis) which is comparable to good quality coals. More than 90% energy of biomass is retained in the biochar. The invention provides an effective means to convert biomass into a high energy density fuel for use in a variety of applications.
WO2011073781	HONEYWELL INT INC	EE.UU.	BIOFUELS FROM LIGNOCELLULOSIC RESOURCES. A method comprising separating a lignocellulosic resource into a substantially cellulosic portion and a substantially non-cellulosic portion; and fermenting the substantially cellulosic portion to produce microbial oil, pyrolyzing the substantially non-cellulosic portions to produce bio-oil or fermenting the substantially cellulosic portion to produce microbial oil and pyrolyzing the substantially non-cellulosic portion to produce bio-oil.
WO2011103313	VIRGINIA TECH INTELL PROP	EE.UU.	PRODUCTION OF PYROLYSIS OIL. Methods for fractional catalytic pyrolysis which allow for conversion of biomass into a slate of desired products without the need for post-pyrolysis separation are described. The methods involve use of a fluid catalytic bed which is maintained at a suitable pyrolysis temperature. Biomass is added to the catalytic bed, preferably while entrained in a non-reactive gas such as nitrogen, causing the biomass to become pyrolyzed and forming the desired products in vapor and gas forms, allowing the desired products to be easily separated.

PRIMERA PLANTA DE COMBUSTIÓN DE PAJA EN CASTILLA Y LEÓN

Acciona Energía ha conectado a la red en Briviesca (Burgos) una planta de biomasa con generación de electricidad por combustión de paja. Esta planta de 16 MW, empleará unas 102000 toneladas anuales de paja de cereal para producir alrededor de 128 Mkw·h de energía limpia y renovable, lo que equivale al consumo de unos 40000 hogares. Esto permitiría evitar la emisión de 123000 toneladas de CO₂ con un efecto depurativo para la atmósfera equivalente al de 6 millones de árboles.

Desde 2002, esta empresa dispone de una planta de biomasa por combustión de paja de 25 MW, en Sangüensa (Navarra). Esta planta produce unos 200 Mkw·h al año mediante la combustión de 160000 toneladas de paja. Cuenta, asimismo, con otras dos instalaciones de producción eléctrica a partir de biomasa (residuos forestales y madereros) de 4 MW, en las provincias de Soria y Cuenca.

A finales de este año, pondrá en funcionamiento una nueva planta de 16 MW en Miajadas (Cáceres), que se alimentará con biomasa herbácea y aportes forestales.

PRODUCCIÓN DE BIOACEITE MEDIANTE FLASH PIRÓLISIS DE ASERRÍN

Investigadores de la Universidad de Concepción (Chile) han desarrollado una tecnología de flash pirólisis para la elaboración de bioaceite a partir de aserrín y otros residuos forestales.

La tecnología consta de tres reactores con lechos fluidizados en serie y un sistema rápido de condensación. En el primer reactor se calienta una arena fina de cuarzo fluidizada que recircula permanentemente entre los reactores para mantener la temperatura, mientras que en el segundo se piroliza el aserrín. El tercer reactor aporta la temperatura al sistema con gases calientes originados en la descarga de la arenilla del reactor de pirólisis y el residuo resultante del proceso de flash pirólisis del aserrín. Los vapores generados en el proceso se enfrían y condensan rápidamente para obtener el bioaceite.

En los primeros ensayos, la planta ha operado con hasta 30 kg de aserrín por hora, pero en capacidad plena se estima podría llegar a 50 kg. Los resultados muestran que por cada kilogramo de materia prima se producen entre 600 y 700 gramos de bioaceite. Este combustible puede ser usado en calderas, hornos de cemento y sistemas de calefacción central y si es sometido a un proceso de refinado podría llegar a utilizarse en vehículos.

Actualmente, se está intentando patentar tanto el sistema de tres reactores como el de enfriamiento. Ya se han realizado cinco solicitudes de patente (Chile, EE.UU., Canadá, Brasil y la Unión Europea).

MINIPLANTA DE GENERACIÓN DE ENERGÍA ELÉCTRICA Y TÉRMICA POR GASIFICACIÓN DE RESTOS DE PODA

El centro tecnológico Cidaut ha diseñado una planta de dos metros de ancho y 12 de largo que se sirve de los sarmientos de las viñas o los restos de las podas de los olivos u otros árboles frutales para generar energía eléctrica y térmica.

En una finca de 400-500 hectáreas se podría instalar una planta de estas características, reservando, adicionalmente, un espacio similar para acumular restos de poda. Una vez convertida la materia prima en astillas se introducirían en la planta donde se sometería a un proceso de gasificación. El gas resultante se enfriaría y se trataría para, posteriormente, introducirlo en motores de combustión interna y producir energía eléctrica. La energía térmica se obtendría, principalmente, del escape y la refrigeración de los motores.

Una de las ventajas de esta planta respecto a las de grandes dimensiones es que en estas últimas se genera gran cantidad de energía térmica que no se utiliza y se expulsa a la atmósfera, mientras que en el caso señalado, al producirse una pequeña cantidad de energía, ésta puede utilizarse fácilmente para uso y disfrute de particulares o para secar los orujos de la uva o de las aceitunas.

Actualmente, Cidaut tiene una planta de pruebas en Mojados (Valladolid) y quiere poner en marcha otra en Nava del Rey (Valladolid) que utilizará el sarmiento de las viñas. La energía térmica se utilizará para secar semillas en una empresa de Navarra.



DIGESTIÓN ANAERÓBICA

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011107419	SCHNEIDER HOLGER	Alemania	<p>PROCESS AND DEVICE FOR ANAEROBIC FERMENTATION. There is proposed a process for generating biogas, electrical energy and heat starting from biological materials, more precisely a process for the anaerobic fermentation of a flowable substrate using a reactor which features at least: ? an inlet, ? an outlet, ? a multiplicity of separating walls which divide at least the internal reactor volume destined for the substrate into a multiplicity of compartments and each individual compartment into at least two chambers through which the substrate flows in countercurrent, where the process proposed here is characterized in that ? for increasing or reducing the ratio of the volume of the chambers through which substrate flows in one direction to the volume of the chambers through which substrate flows in the other direction at least some of the separating walls are arranged moveably in respect of their spatial location and/or position and/or extension, ? where the movement and/or extension of the separating walls is controlled as a function of the dry-matter content of the flowable substrate. Equally, there is also proposed a reactor as is used for the process according to the invention.</p>
US2011203992	SIEMENS WATER TECH CORP	EE.UU.	<p>HYBRID AEROBIC AND ANAEROBIC WASTEWATER AND SLUDGE TREATMENT SYSTEMS AND METHODS. A hybrid method and system of treating wastewater with reduced energy usage is disclosed. The treatment system has a sorption system, an anaerobic digester that digests or converts at least a portion of the solids or sludge from the sorption system, and an aerobic treatment tank that partially reduces oxygen demand of a portion of the sludge from the sorption tank.</p>
US2011200954	SEAB ENERGY	Gran Bretaña	<p>RENEWABLE ENERGY MICROGENERATION SYSTEM. A renewable energy microgeneration system is disclosed. The system includes a portable processing container with a mixing tank for mixing waste with a liquid, a macerating pump in fluid communication with the mixing tank that is configured to macerate the waste into smaller pieces, a plurality of small holding tanks in fluid communication with the mixing tank that are configured to perform at least one of a pasteurization thermophilic anaerobic digestion on the waste, a large holding tank in fluid communication with the plurality of small holding tanks that is configured to perform mesophilic anaerobic digestion on the waste after at least one of a pasteurization thermophilic anaerobic digestion is performed on the waste, and a de-watering unit in fluid communication with the large holding tank that is configured to dry what remains of the waste after mesophilic anaerobic digestion is performed on the waste; a controller for automating the flow of the waste between the mixing tank, the plurality of small holding tanks, the large holding tank, and the de-watering unit such that a user does not need to complete any tasks for performing mesophilic anaerobic digestion after the waste is loaded into the mixing tank; and a portable gas storage container comprising a gas storage tank that is configured to store biogas generated by the mesophilic anaerobic digestion, wherein the portable processing container and the portable gas storage container are configured to be transported to a site and placed in fluid communication with each other so the gas storage tank can store biogas generated by mesophilic anaerobic digestion in the processing container at the site.</p>

DIGESTIÓN ANAERÓBICA

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
FR2956657	DEGREMONT	Francia	<p>DESULFURIZATION OF BIOGAS PRODUCT IN URBAN, AGRICULTURAL AND/OR INDUSTRIAL EFFLUENT DIGESTER, COMPRISES PERFORMING NON-LOCALIZED DIFFUSED INJECTION OF OXIDANTS, GAS/LIQUIDS IN DIGESTATES FOR REDUCING FORMATION OF HYDROGEN SULFIDE. The process for desulfurization of biogas product in urban, agricultural and/or industrial effluent digester, comprises performing non-localized diffused injection of oxidants, gas or liquids in digestates in either high dosage for reducing the formation of hydrogen sulfide or weak dosage for not generating anaerobic digestion. The digester comprises a top enclosure closed by a dome, where anaerobic digestion of products takes place in the enclosure to form the digestates with a gas volume. The sulfur products remain in the form of dispersed particles in the digestate. The process for desulfurization of biogas product in urban, agricultural and/or industrial effluent digester, comprises performing non-localized diffused injection of oxidants, gas or liquids in digestates in either high dosage for reducing the formation of hydrogen sulfide or weak dosage for not generating anaerobic digestion. The digester comprises a top enclosure closed by a dome, where anaerobic digestion of products takes place in the enclosure to form the digestates with a gas volume. The sulfur products remain in the form of dispersed particles in the digestate. The injection of oxidant is performed by gradual increase in the flow including increments until a decrease and then stabilization of the hydrogen sulfide content in biogas. The injected oxidant is a gas comprising air or oxygen. The ratio of the flow rate of oxidant gas is less than 15% of air and 3% of oxygen above which anaerobic digestion is degraded. When an oxidant other than air or oxygen is used, the flow of oxidant injected is 1-5 times the stoichiometry required for the chemical reaction with the sulfide content. Independent claims are included for: a device for desulfurization of a biogas product; and an urban, agricultural and/or industrial effluent digester.</p>
DE102010000159	BORDA EV BREMEN OVERSEAS RES AND DEV ASS	Alemania	<p>SYSTEM AND METHOD FOR ANAEROBIC TREATMENT OF ORGANICALLY POLLUTED WASTE WATER. The invention relates to a system for anaerobic treatment of organically polluted waste water, by means of which the waste water can be conducted in a horizontal general flow direction, rising and descending solely under the effects of gravity and/or the pressure of the biogas produced by the waste water, comprising a container having a front wall, a floor, a rear wall, a ceiling and two side walls, an inlet, an outlet and reaction chambers which are arranged successively in the direction of flow and fluidically connected to each other, which are formed by vertical partitions which are connected at least liquid-tight to the floor and the side walls, wherein the partitions have flow devices; in the upper region which are connected to the preceding reaction chamber and to a vertically running device having a liquid outlet opening and a gas outlet opening in the next reaction chamber and at least one separating device in the lower region by means of which a fluid connection can be established between two reaction chambers.</p>

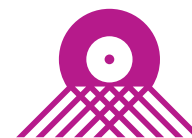


DIGESTIÓN ANAERÓBICA

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
GB2477423	AEROTHERMAL GROUP PLC	Gran Bretaña	WASTETREATMENT AUTOCLAVE AND METHOD. A method and apparatus are provided in which waste is steam autoclaved 10, 12 to produce wet treated waste of solids content higher than 3-60 wt% water, separating recyclables from an organic rich aqueous fraction of the wet treated waste, then anaerobically digesting the organic rich fraction to create methane. The recovered methane is then combusted to generate power and waste heat, generating steam for autoclaving using exhaust gas from the internal combustion, recovering jacket water from the internal combustion and supplying steam derived from the jacket water as a warm feed for maintaining an elevated temperature for the anaerobic digestion.
DE102010054634	NQ ANLAGENTECHNIK GMBH	Alemania	BIOGAS PLANT, USEFUL FOR GENERATING A COMBUSTIBLE BIOGAS, COMPRISES A FERMENTATION TANK FOR A FERMENTING MASS, A STORAGE- AND A DOSING DEVICE WITH A STORAGE CONTAINER AND A PULLING DEVICE, AND A DISCHARGE CONVEYING DEVICE. Biogas plant comprises: (a) a fermentation tank for a fermenting mass; (b) a storage- and a dosing device with a biomass with a storage container, which is designed with a flexible, anti-slipping insert for loading with the biomass, and exhibits an unloading edge, and a pulling device for reducing the insert in the storage container, so that biomass resting on it is raised up to the unloading edge; and (c) a discharge conveying device for the biomass from the storage- and the dosing device into a filling port of the fermentation tank.
WO2011080766	KIRLOSKAR INTEGRATED TECHNOLOGIES LTD	India	COMBINED DRY AND WET DUAL PHASE ANAEROBIC PROCESS FOR BIOGAS PRODUCTION. The present invention encompasses a self sustaining and combined dual biomethanation process to produce biogas and manure. The said biomethanation process comprises two or more different biogas reactors using mixed and/or multiple solid biomass as feed. The lechates generated from the solid digester are utilized by recirculating the lechates produced, thereby ensuring optimum biogas generation.
WO2011072369	CH FOUR BIOGAS INC	Canadá	ANAEROBIC TREATMENT SYSTEM AND DEVICE. An anaerobic organic substrate treatment system is provided which comprises digester tubes wherein an inner bag of the digester tube is used to collect the solids content of the waste and an outer bag of the digester tube is used to collect the liquid and gas leachate from waste slurry input into the digester tubes. The inner bag is permeable to both gas and liquid while the outer bag is impermeable to both gas and liquid and allows for collection of gas and liquid leachate in the outer bag. Collected gas and liquid leachate may then be drained and collected using a drainage and collection system. Following treatment, the outer bag may be opened to retrieve the inner bag for retrieval of the treated solids substrate. The substrate may then be used as needed. In one variant, the outer bag is re-sealable and may be reused in further treatment operations. The anaerobic waste treatment system may be used to carry out such treatment operations as storage/hydrolysis, methanization, and/or digestate treatment.

DIGESTIÓN ANAERÓBICA

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011075073	NORUPS GAARD AB	Suecia	<p>DIGESTER AND METHOD FOR PRODUCTION OF BIOGAS.</p> <p>Digester for production of biogas in a dung pit containing biological material, wherein the digester comprises a dung pit containing biological material, which dung pit comprises a bottom, wherein the digester further comprises a roof covering the dung pit and at least one insulating element, which is placed on the bottom of the dung pit and at least partly insulates the bottom of the dung pit. A method for production of biogas in a dung pit containing biological material, wherein said dung pit comprises a bottom and is provided with a roof covering the dung pit and at least one insulating element, which is placed on the bottom of the dung pit and at least partly insulates the bottom of the dung pit, wherein the method comprises collecting produced biogas at the roof covering the dung pit. A method for converting a dung pit containing biological material to a digester for production of biogas, wherein the dung pit comprises a bottom, and wherein the method comprises immersion of at least one insulating element into the dung pit, placement of said at least one insulating element on the bottom of the dung pit and covering of the dung pit with a roof.</p>
WO2011073618	ADVANCED BIOGAS TECHNOLOGIES SRL	Rumania	<p>ANAEROBIC REACTOR. An anaerobic reactor comprising two or more discrete reaction chambers arranged one above the other is disclosed. The reactor may be in the form of a tank separated into discrete chambers by means of solid members, or the reactor may be in the form of separate and stackable chambers. Additionally, the reactor may be a packed bed reactor, a fluidised bed reactor, or a hybrid reactor comprising at least one packed bed reaction chamber and at least one fluidised bed reaction chamber. Use of an anaerobic reactor according to the invention enables an increase in the yield of biogas that can be produced per unit area of land occupied by an anaerobic reactor. A method of producing biogas is also disclosed, the method comprising providing an anaerobic reactor according to the invention, providing input biomass, carrying out anaerobic digestion of the biomass in the reactor, and collecting the biogas produced.</p>



FERMENTACIÓN DE AZÚCARES

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011106576	QTEROS INC	EE.UU.	METHODS AND COMPOSITIONS FOR ENHANCED ENZYME ACTIVITY IN FERMENTING MICROORGANISMS. This invention provides systems and methods for the production of compounds by recombinant microorganism that express species whereby the recombinant species are genetically-modified, for hydrolysis and fermentation of carbonaceous biomass to synthesize compounds of commercial value. Genetic modification can be for the expression of low temperature-adapted enzymes. The recombinant microorganism can be a Clostridium, such as C. phytofermentans.
US2011207191	KOREA INST SCI & TECH	Corea	METHOD FOR PRODUCING ALCOHOL USING BIOETHANOL WASTE FERMENTED SOLUTION. Provided is a method for producing alcohol or hydrogen gas comprising culturing alcohol-producing microorganisms in a waste fermented solution generated from the bioethanol production process. Glycerol included in the waste fermented solution generated from the bioethanol production process is converted by the microorganisms to butanol under an anaerobic condition. Since the waste fermented solution generated from the bioethanol production process can be utilized as a source of a biofuel, environmental and energy problems can be solved at once.
WO2011100272	SYNGENTA PARTICIPATIONS AG	Suiza	SYSTEMS AND PROCESSES FOR PRODUCING BIOFUELS FROM BIOMASS. Systems and processes for converting bulky lignocellulosic biomass to high density biomass products, including biofuels, are described. The systems and processes relate to treating freshly harvested plant materials, generally at or in close proximity to sites where the plant materials are harvested, to effect saccharification, alcoholic fermentation, or simultaneous saccharification and fermentation, thereby providing a biomass slurry. The biomass slurry is extracted to provide liquid extracts comprising biomass-derived water and water soluble biomass saccharification and fermentation products, including fermentable sugars and alcohols. The biomass slurry extracts can be transported via pipeline to other locations for fermentation, further saccharification, and/or purification to provide biofuel. Alternatively, the biomass slurry can be used to prepare a biomass slurry that can be transported via pipeline.
WO2011098577	DSM IP ASSETS BV	Holanda	HOST CELL CAPABLE OF PRODUCING ENZYMES USEFUL FOR DEGRADATION OF LIGNOCELLULOSIC MATERIAL. The invention relates to a host cell comprising at least four different heterologous polynucleotides chosen from the group of polynucleotides encoding cellulases, hemicellulases and pectinases, wherein the host cell is capable of producing the at least four different enzymes chosen from the group of cellulases, hemicellulases and pectinases, wherein the host cell is a filamentous fungus and is capable of secretion of the at least four different enzymes. This host cell can suitably be used for the production of an enzyme composition that can be used in a process for the saccharification of cellulosic material.
WO2011097711	IOGEN ENERGY CORP	Canadá	METHOD FOR THE PRODUCTION OF A FERMENTATION PRODUCT FROM LIGNOCELLULOSIC FEEDSTOCKS. The present invention comprises pretreating a lignocellulosic feedstock with acid at a pH between about 2.0 and about 3.5 to produce a composition comprising an acid pretreated feedstock. The acid pretreated feedstock is then enzymatically hydrolyzed with cellulases and α -glucosidase. The glucose is fermented by microorganisms to produce a fermentation broth comprising the fermentation product, followed by recovery of the fermentation product. The steps of enzymatically hydrolyzing and fermenting are conducted at a pH below about 4.0.

FERMENTACIÓN DE AZÚCARES

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011097070	ARCHER DANIELS MIDLAND CO	EE.UU.	IMPROVED GRAIN MILLING PROCESS. A modification is described of a dry grind process for producing ethanol and other co-products from whole grain, whereby the mash is thermochemically treated by cooking the mash in the presence of an organic acid. The organic acid effectively hydrolyzes both the starch and hemicellulosic components in the milled corn to provide fermentable sugars from both the endosperm and other parts of the kernel, without, however, also producing fermentation-inhibiting levels of other known products of the acid hydrolysis of hemicellulosic materials, such as hydroxymethylfurfural (HMF) and furfural. Further, the organic acid is able to solubilize both the starch and the more recalcitrant hemicelluloses while only partially hydrolyzing the same, so that most of the starch and hemicelluloses are hydrolyzed to oligomers and the amount of chemically labile and reducing sugars is kept sufficiently low as to also not appreciably interfere with the fermentation to ethanol.
US2011177559	XYLECO INC	EE.UU.	PROCESSING MATERIALS. Biomass feedstocks (e.g., plant biomass, animal biomass, and municipal waste biomass) are processed to produce useful products, such as fuels. For example, systems are described that can convert feedstock materials to a sugar solution, which can then be fermented to produce ethanol. Biomass feedstock is saccharified in a vessel by operation of a jet mixer, the vessel also containing a liquid medium and a saccharifying agent.
US2011171707	POLYMER VENTURES INC	EE.UU.	COMPOSITION AND METHODS FOR IMPROVING THE PRODUCTION OF FERMENTATION OPERATIONS. Methods and compositions for improving the production of ethanol by a microorganism in a fermentation medium are provided, where the method comprises adding to the fermentation medium an emulsion comprising a monoterpene and a surfactant in an amount sufficient to improve the production of ethanol.
WO2011079158	DU PONT	EE.UU.	PROCESS FOR SIMULTANEOUS SACCHARIFICATION AND FERMENTATION FOR PRODUCTION OF ETHANOL. Methods are disclosed for the production of high concentrations of ethanol from biomass using <i>Zymomonas</i> as the ethanologen. <i>Zymomonas</i> is grown under conditions of low impeller agitation with high concentration of insoluble solids in a saccharification-fermentation mixture during a simultaneous saccharification and fermentation reaction for the production of high concentrations of ethanol.

PRODUCCIÓN DE BIOGÁS A PARTIR DE LOS RESTOS ORGÁNICOS DE LOS PAÑALES

Los pañales están formados por un conglomerado de plásticos, polímeros y celulosa a los que se añaden, en su desecho, residuos orgánicos (excrementos y orina).

La dirección de Grandes Proyectos de SITA, filial de Suez Environnement en el sector del tratamiento y valorización de los

residuos con el objetivo de evaluar el potencial de reciclaje de los pañales, ha puesto en marcha el proyecto "Happy nappy". En él, primeramente se probará un sistema piloto que separará y aislará los distintos componentes del pañal y, posteriormente, se evaluará el potencial de reciclaje energético y material de los elementos que componen el pañal.

La materia orgánica se podría utilizar para obtener biogás mediante un proceso de codigestión consis-

tente en la mezcla y fermentación acelerada de los residuos orgánicos de los pañales con lodos de depuradoras.

En la actualidad, el *Centre International de Recherche Sur l'Eau et l'Environnement* de Suez Environnement lleva a cabo la fase de investigación en laboratorio. Los resultados obtenidos indicarán lo factibles del proceso, los beneficios medioambientales y su validez técnica y económica. En este proyecto también participan otros



dos centros de investigación, el *Institut National de la Recherche Agronomique* y la *Association pour l'Environnement et la Sécurité en Aquitaine*.

BIOGÁS A PARTIR DE SUBPRODUCTOS DE LA PRODUCCIÓN DE BIODIÉSEL

En la Universidad de Sao Paulo (Brasil) se ha demostrado la viabilidad de producir biogás a partir del glicerol, subproducto que se obtiene durante la producción de biodiésel.

En la investigación se utilizó un reactor UASB operando con una eficiencia del 90% en la transformación del glicerol en metano, llegando a conseguirse cerca de 62 litros de biogás por día. A partir de estos resultados, se sugiere la construcción de un reactor con capacidad para producir 16000 m³ de biogás por día, correspondientes a 6 MW de electricidad, capacidad suficiente para abastecer a cinco mil familias.

Antes de su tratamiento, el glicerol debe diluirse con el fin de reducir la concentración de sales en el sistema, ya que podrían ser tóxicas para los microorganismos contenidos en el reactor.

TRANSFORMACIÓN DE RESIDUOS DE MATADEROS EN BIOGÁS

Investigaciones realizadas en la Universidad de Burgos han demostrado que es posible convertir los residuos originados en los mataderos en biogás. Estos residuos se caracterizan por su elevado poder contaminante derivado de su contenido de sangre.

La técnica desarrollada consiste en la combinación de dos procesos, uno anaerobio de película fija y otro, posterior, aerobio de membranas de fibras huecas. En el primero, se añade a los residuos un

material de relleno con forma tubular al que los microorganismos se adhieren y en el que se forma una película que les protege contra los productos tóxicos inhibidores. En el segundo, se retiene en el efluente a los microorganismos, los cuales crecen en unas condiciones adversas en las que hay mucho nitrógeno y se especializan en eliminar los contaminantes de los sustratos.

Los experimentos para desarrollar este sistema se han realizado a escala piloto con aguas residuales procedentes de mataderos que se han tratado en reactores utilizados comúnmente en estas instalaciones y que poseen una capacidad de uno y dos metros cúbicos,

La instalación de este sistema en los mataderos no conllevaría unos costes mucho más elevados que con la del tradicional sistema aerobio.

BIOETANOL DE SEGUNDA GENERACIÓN MEDIANTE ENZIMAS DEL INTESTINO DE LAS TERMITAS

Investigadores de dos Universidades de EE.UU., la Universidad de Florida y la Universidad de Purdue (Indiana), han dado un paso más en la obtención de enzimas destinadas a la fabricación de bioetanol de segunda generación. El estudio del intestino de las termitas ha dado las claves para replicar enzimas en laboratorio que pueden acelerar la fermentación del etanol procedente de materias primas leñosas.

Los científicos midieron la producción de azúcar de las enzimas que actúan en el intestino de las termitas y las de los simbiontes, pequeños protozoos que viven en los intestinos de estos insectos y que ayudan en la digestión del material leñoso.

Tras identificar y separar las enzimas, hicieron réplicas de ellas en el laboratorio y las pruebas demostraron que eran igualmente

eficaces en la liberación de azúcares a partir de la biomasa. Durante las pruebas se observó que las enzimas sintéticas actuaron sobre diferentes partes de la biomasa. Dos de ellas fueron responsables de la liberación de glucosa y pentosa, mientras que una tercera descompuso la lignina que constituye las paredes celulares vegetales.

EFFECTO DE LAS MEMBRANAS DE ATRAPAMIENTO SOBRE LA ACTIVIDAD DE LAS ENZIMAS EN LA PRODUCCIÓN DE BIOETANOL

Investigadores de la Academia Sinica (Taiwán), de la Universidad Católica de Fu Jen (Taiwán), de la Universidad Nacional de Taiwán y de la Universidad Tecnológica del Rey Mongkut (Tailandia) han estudiado cómo afecta la utilización de membranas de atrapamiento en la actividad de las enzimas utilizadas en la producción de bioetanol a partir de paja de arroz.

Se estudiaron las diferencias entre la actividad enzimática de las enzimas lignocelulolíticas libres y atrapadas (la celulasa, la xilanasas y la lacasa), en condiciones de trabajo de 37° C y pH 5.5. Los resultados obtenidos fueron que la actividad de las enzimas atrapadas aumentaba un 57.9%, 19.39% y 20.34%, respectivamente, en comparación con las libres. Esto se traduciría en un incremento del 29%, o de 465.46 a 601.05 mg por gramo de arroz.

Por lo tanto, y de acuerdo con estos resultados, el atrapamiento de enzimas es una forma de mejorar las propiedades biocatalíticas (como la actividad, la estabilidad y la capacidad de reutilización) de las enzimas utilizadas para hidrolizar la paja de arroz y de separar los productos del medio de reacción.

TECNOLOGÍAS QUÍMICAS

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011102841	DE CRECY EUDES	EE.UU.	A METHOD OF PRODUCING BIOFUEL, BIODIESEL, AND OTHER VALUABLE CHEMICALS. A method for producing a hydrocarbon based product (e.g., biofuel or biodiesel), a microorganism (e.g., algae) that can be cultivated and harvested for producing a hydrocarbon based product, a method for producing a hydrocarbon based product from a by-product of biodiesel production, and a microorganism that can be cultivated from a by-product of biodiesel production and harvested for producing hydrocarbon based product.
WO2011105291	NAT INST OF ADVANCED IND SCIEN	Japón	BIODIESEL FUEL MANUFACTURING METHOD AND BIODIESEL FUEL COMPOSITION. Provided is a biodiesel fuel manufacturing method which enables selective hydrogenation from a polyunsaturated fatty acid alkyl ester to a monounsaturated fatty acid alkyl ester while controlling the formation of trans fats in order to manufacture a biodiesel fuel with superior oxidation stability and low-temperature fluidity. Also disclosed is a biodiesel fuel composition. The biodiesel fuel manufacturing method uses hydroprocessing of oils and fats which have undergone transesterification, and/or fatty acid alkyl esters prepared from edible waste oils, and/or fatty acid alkyl esters that have undergone fatty acid esterification in the presence of a hydrogenation catalyst containing at least one noble metal selected from the noble metals in groups 8-10 of the periodic table and in a hydrogen atmosphere at low pressure.
US2011203165	CHEVRON USA INC	EE.UU.	ENHANCED BIODIESEL FUEL HAVING IMPROVED LOW-TEMPERATURE PROPERTIES AND METHODS OF MAKING SAME. The present invention is generally directed to novel biodiesel fuel compositions having enhanced low-temperature properties. The present invention is additionally directed to methods (i.e., processes) for making such enhanced biodiesel fuels by improving the low-temperature properties of ester-based biodiesel fuels via in situ enhancement and/or additive enhancement.
WO2011095249	EVONIK ROHMAX ADDITIVES GMBH	Alemania	A COMPOSITION HAVING IMPROVED FILTERABILITY. The present invention describes a fuel oil composition comprising at least one biodiesel oil and at least one additive for improving the filterability. In addition thereto, the present invention discloses a method for improving the filterability of a fuel oil comprising a biodiesel and a use of a polyalkyl (meth) acrylate polymer to improve the filterability of a fuel oil comprising a biodiesel.



TECNOLOGÍAS QUÍMICAS

Nº DE PUBLICACIÓN	SOLICITANTE	PAÍS ORIGEN	CONTENIDO TÉCNICO
WO2011070445	BLASCO GARCIA ALFREDO CARLOS	España	<p>CONTINUOUS METHOD FOR PRODUCING BIODIESEL FUEL.</p> <p>The invention relates to a continuous method for producing biodiesel fuel, with conversion of more than 99.90 wt% of the triglycerides into biodiesel during the transesterification step, which includes: a) providing a source of triglycerides with a triglyceride concentration of more than 99.0 wt%; b) subjecting the triglycerides to a transesterification reaction with methanol, ethanol and the mixes thereof, in a mole reaction of triglycerides and alcohol of 1:3-3.5, in the presence of 0.7 to 1.0 wt% of sodium or potassium hydroxide as a catalyst, under conditions of ultrasonic cavitation in an ultrasonic cavitation reactor with 2 to 8 cavitation cells in series, at a temperature of 45 C to 60 DEG C, at a pressure of 1.5 to 2 MPa (15 - 20 atm) and for a time of 15 to 30 seconds; c) recovering the product from step b) and subjecting same to a mechanical agitation operation, at a temperature of 45 C to 60 DEG C, for a maximum time of 10 minutes until the transesterification reaction is completely finished, obtaining a conversion of more than 99.90 wt% of the triglycerides into biodiesel; d) decanting and/or centrifuging the product obtained from step c) to eliminate the glycerine; e) purifying the biodiesel obtained in step d) using exchange resins; and f) eliminating the methanol and the water from the product obtained in step e) by distillation and recovering the biodiesel fuel thus obtained.</p>
US2011151524	CAVITATION TECHNOLOGIES INC	EE.UU.	<p>PROCESS FOR PRODUCING BIODIESEL THROUGH LOWER MOLECULAR WEIGHT ALCOHOL-TARGETED CAVITATION.</p> <p>Method for producing fatty acid alkyl esters from biolipids through transesterification and/or esterification reactions uses a flow-through cavitation device for generating cavitation bubbles in a fluidic reaction medium. The fluidic medium is passed through sequential compartments in the cavitation device having varying diameters and inner surface features to create localized reductions in fluid pressure thus vaporizing volatile alcohols and creating an increased surface area and optimized conditions for the reaction to occur at the gas-liquid interface around the bubbles.</p>

PRODUCCIÓN DE BIODIÉSEL MEDIANTE CATÁLISIS ENZIMÁTICA DE LIPASAS DEL PAN

El departamento de Química Orgánica de la Universidad de Córdoba y la empresa Séneca Green Catalyst llevan cuatro años de investigación sobre la producción de biodiésel a partir de aceites usados y grasas animales. Los investigadores centraron sus estudios en cómo eliminar el hidróxido sódico que se utiliza como catalizador en la producción del biodiésel y así obtener un biocombustible sin subproductos (glicerina), ni residuos (agua contaminada).

Para ello, sus investigaciones se basan en la sustitución de la sosa cáustica por un catalizador biológico como son las lipasas, enzimas presentes en casi todos los seres vivos, y, concretamente, un tipo de lipasas utilizadas en la producción del pan. Los resultados fueron que por cada molécula de triglicérido

que se descompone, se producen dos moléculas de biodiésel y una de monoglicérido, molécula de propiedades similares al biodiésel e inocua para los motores.

En estudios preliminares, se había utilizado la lipasa pancreática del cerdo, obteniéndose los mismos resultados, pero con mayor coste, lo que dificultaba la réplica a escala industrial. Sin embargo, la nueva lipasa tiene un coste realmente asequible y, además, se caracteriza por su fácil acceso en el mercado.

CONFINAMIENTO DE ENZIMAS PARA LA PRODUCCIÓN CONTINUA DE BIODIÉSEL A ESCALA COMERCIAL

Un equipo de investigadores franceses del Instituto de Ciencias Moleculares y del Laboratorio de Química de la Materia Condensada emplean espumas biohíbridas monolíticas para confinar las enzimas que se utilizan en la producción de

biodiésel durante un periodo de tiempo relativamente largo (aproximadamente dos meses).

El confinamiento en las espumas biohíbridas permite una buena accesibilidad e incremento del transporte de masa, obteniéndose un alto rendimiento de biodiésel. La estabilidad de las enzimas a largo plazo hace que el proceso sea interesante para aplicaciones comerciales. Los investigadores idearon un método para la producción in situ del nuevo biocatalizador en el propio reactor, lo que hizo posible la producción industrial del biocombustible en un flujo ininterrumpido, continuo y unidireccional, obteniéndose, además, unos rendimientos de producción de biodiésel muy elevados.

El siguiente paso en esta investigación es la conversión de triésteres sin disolventes, con el fin de minimizar la producción de residuos, limitando el uso de disolventes y metales en los procesos de transformación química.

Boletín elaborado con la colaboración de:



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Ciemat
Centro de Investigaciones
Energéticas, Medioambientales
y Tecnológicas

Montalbán, 3. 2º Dcha.
28014 Madrid
Tel: 91 781 00 76
E-mail: fundacion_opti@opti.org
www.opti.org

Paseo de la Castellana, 75
28071 Madrid
Tel: 91 349 53 00
Email: carmen.toledo@oepm.es
www.oepm.es

Avda Complutense 22.
28040 Madrid
Tel: 91 346 08 99
e-mail: marta.perez@ciemat.es
www.ciemat.es