



## APOYO DE LA UNIÓN EUROPEA A LA INVESTIGACIÓN EN EL CAMPO DE LA BIOMASA

La biomasa puede ser una excelente alternativa energética. Así, mediante procesos específicos, se puede obtener toda una serie de combustibles sólidos, líquidos o gaseosos que pueden ser aplicados para cubrir las necesidades energéticas, transporte, industria, electricidad, o servir de materia prima para la industria. Por estas razones, la biomasa se puede considerar como la fuente de energía del futuro.

En España existen muchas empresas, PYMEs, Universidades, Centros de Investigación, etc. que desarrollan proyectos en esta área. En la Tabla 1 se recogen los proyectos relacionados con la obtención de energía o combustibles a partir de biomasa, en los que participan entidades españolas, aprobados en las últimas convocatorias del programa Horizon 2020 y en la Tabla 2 se encuentran agrupados dichos proyectos en función del tema de la convocatoria.

Se ha identificado 16 proyectos con subvenciones que oscilan entre los 50 000 euros y los 8 622 292,6 € euros (Tabla 1). La Unión Europea financio el coste total al 50% de los proyectos. En la Tabla 1 se encuentra, también, el proyecto "Production of fully synthetic paraffinic jet fuel from wood and other biomass" financiado por el 7PM pero que se ha considerado debido a que ha comenzado a desarrollarse este año.

Los proyectos SMITH, Kurat Systems, COSYNAT, Enerbox y DEPURGAN han obtenido la financiación a través del instrumento PYME (Tabla 2). El instrumento PYME es un esquema de financiación en fases mediante subvención, dirigido a dar apoyo a aquellas PYMEs, que tenga la ambición de crecer, desarrollarse e internacionalizarse a través de un proyecto de innovación de dimensión Europea. El programa tiene 3 fases:

- **Fase 1:** Evaluación de concepto y viabilidad. (50 000 € por proyecto y duración máxima 6 meses).
- **Fase 2:** Desarrollo, demostración y replicación en el mercado. (la financiación está comprendida entre 500 000 € y 2 500 000 € por proyecto, duración 1-2 años con subvención del 70% del presupuesto elegible del proyecto).
- **Fase 3:** Comercialización, sin financiación directa, incluye diferentes acciones de apoyo, como presentación a entidades de Capital Riesgo europeas.

El proyecto DEPURGAN ha sido financiado en fase 2 y el resto en fase 1.

Dos proyectos, COUPCAT y NANOBIOENER, han sido financiados en el pilar de ciencia excelente dentro de las acciones Marie Skłodowska-Curie (Tabla 2). Estas acciones tienen como objetivo garantizar el desarrollo óptimo y el uso dinámico del capital intelectual de Europa, con el fin de generar, desarrollar y transferir nuevas capacidades, conocimiento e innovación y, de este modo, alcanzar todo su potencial en todos los sectores y regiones. Están dirigidas a investigadores en todas las etapas de sus carreras, en los sectores públicos y privados, desde la formación inicial de los investigadores (especialmente jóvenes investigadores) a la formación permanente y la formación profesional. Son Becas Individuales (Individual Fellowships – IF) y tienen como objetivo mejorar el potencial creativo e innovador de los investigadores con experiencia, a través de proyectos individuales, fomentando la movilidad internacional e intersectorial tanto en universidades, centros de investigación, infraestructuras de investigación, empresas, PYME y otros grupos socioeconómicos de toda Europa y de fuera de ella. Hay dos modalidades de participación:

- MSCA-IF-2015-EF: Marie Skłodowska-Curie Individual Fellowships (IF-EF): Becas europeas, (IF European), con movilidad dentro de la Unión Europea.
- MSCA-IF-2015-GF: Marie Skłodowska-Curie Individual Fellowships (IF-GF): Becas Globales, Global Fellowships (IF Global), con movilidad fuera de la Unión Europea y una fase de retorno a Europa obligatoria.

El resto de los proyectos han sido financiados en las distintas convocatorias competitivas del programa Horizon 2020.

**Tabla1:**

PROYECTOS EUROPEOS CON PARTICIPACIÓN ESPAÑOLA		
Título: Synthesis of methanol from captured carbon dioxide using surplus electricity Acrónimo: MethCO2 Identities españolas: I-Deals Innovation & Technology Venturing Services SL Coste total: 11 041 537,46 €	Fecha de inicio: 01-12-2014	Fecha de finalización: 01-12-2018 Subvención UE: 8 622 292,6 €
Título: Supporting Sustainable Energy Production from Biomass from Landscape Conservation and Maintenance Work Acrónimo: greenGain Identities españolas: Fundación Circe; Grupo de Acción Local Bajo Aragón-Matarrana Coste total: 1 829 390,5 €	Fecha de inicio: 01-01-2015	Fecha de finalización: 01-01-2018 Subvención UE: 1 829 390,5 €
Título: Turning unexploited food waste into biomethane supplied through local filling stations network Acrónimo: Bin2Grid Identities españolas: Instituto Andaluz de Tecnología Coste total: 709 468,75 €	Fecha de inicio: 01-01-2015	Fecha de finalización: 01-01-2018 Subvención UE: 709 468 €
Título: Production of fully synthetic paraffinic jet fuel from wood and other biomass* Acrónimo: BFSJ Identities españolas: Abengoa, SA Coste total: 55 610 075,2 €	Fecha de inicio: 01-01-2015	Fecha de finalización: 31-12-2019 Subvención UE: 27 805 038 €
Título: Flexible Superheated Steam Torrefaction and Grinding of Indigenous Biomass from Remote Rural Sources to Produce Stable Densified Feedstocks for Chemical and Energy Applications Acrónimo: SteamBio Identities españolas: Comercial e Industrial Aries, SA; Fundación Circe; Urbión Consultores, SL Coste total: 6 979 982,05 €	Fecha de inicio: 01-02-2015	Fecha de finalización: 01-02-2018 Subvención UE: 5 829 783,42 €
Título: Coupling dimerisation and metathesis reactions to produce propene from ethanol using heterogeneous catalysts and microreactor systems Acrónimo: COUPCAT Identities españolas: Univ. Pais Vasco Coste total: 257 191,2 €	Fecha de inicio: 01-04-2015	Fecha de finalización: 01-04-2018 Subvención UE: 257 191,2 €
Título: Securing future-proof environmentally compatible bioenergy chains Acrónimo: SECURECHAIN Identities españolas: Univ. Politecnica de Catalunya; Centre Tecnologic Forestal de Catalunya Coste total: 1 809 586,252 €	Fecha de inicio: 01-04-2015	Fecha de finalización: 01-04-2018 Subvención UE: 1 809 586,25 €
Título: Clean, Versatile and Cost-effective Waste-to-Energy Solution Acrónimo: COSYNAT Identities españolas: Indemesa, SL; Dobra Consejeros de Desendolcu Internacional de Negocios Coste total: 71 429 €	Fecha de inicio: 01-05-2015	Fecha de finalización: 01-09-2015 Subvención UE: 50 000 €
Título: NanoBio-inorganic generators for conversion of renewable chemical energy into electricity Acrónimo: NANOBIOENER Identities españolas: Asociacion Centro de Investigacion Cooperativa en Biomateriales- CicBiomaGune* Coste total: 158 121,6 €	Fecha de inicio: 01-05-2015	Fecha de finalización: 01-05-2017 Subvención UE: 158 121,6 €
Título: Next Generation Bio-butanol Acrónimo: ButaNexT Identities españolas: Tecnicas Reunidas, SA; Fundacion CENER-CIEMAT; Univ. Castilla - La Mancha; Zabala Innovation Consulting, SA Coste total: 4 599 414 €	Fecha de inicio: 01-05-2015	Fecha de finalización: 01-05-2018 Subvención UE: 4 599 414 €
Título: Sustainable and Standalone Oxyhydrogen powered heat generator box Acrónimo: Enerbox Identities españolas: Instalaciones de Sistemas Energéticos Eficientes, SL Coste total: 71 429 €	Fecha de inicio: 01-06-2015	Fecha de finalización: 01-10-2015 Subvención UE: 50 000 €
Título: High Quality Fuel Production System from Plastics, Industrial Oil and Refinery Residues Acrónimo: Kurata Systems Identities españolas: Legoriza, SRL Presupuesto: 71 419 €	Fecha de inicio: 01-07-2015	Fecha de finalización: 01-11-2015 Subvención UE: 50 000 €
Título: SMart and Interoperable THermal network system development Acrónimo: SMITH Identities españolas: QuantitasEnergy, SL*; Factor Verde Coste total: 71 429 €	Fecha de inicio: 01-07-2015	Fecha de finalización: 01-01-2016 Subvención UE: 50 000 €

## PROYECTOS EUROPEOS CON PARTICIPACIÓN ESPAÑOLA

Título: Fifth generation, Low temperature, high EXergY district heating and cooling NETworks Acrónimo: FLEXYNETS Identities españolas: Acciona Infraestructuras, SA Coste total: 1 999 363,75 € Subvención UE: 1 999 363,75 €	Fecha de inicio: 01-07-2015 Fecha de finalización: 01-07-2018
Título: Combined Ultrasonic and Enzyme treatment of Lignocellulosic Feedstock as Substrate for Sugar Based Biotechnological Applications Acrónimo: US4GREENCHEM Identities españolas: FundacionTecnaliaResearch&Innovations Coste total: 3 803 925 € Subvención UE: 3 457 602,5 €	Fecha de inicio: 01-07-2015 Fecha de finalización: 01-07-2019
Título: Swine-farm revolution Acrónimo: DEPURGAN Identities españolas: Eurogan, SL Coste total: 2 702 032,5 € Subvención UE: 1 890 110,25 €	Fecha de inicio: 01-09-2015 Fecha de finalización: 01-05-2017
Título: BIOgasmembranereformerfordeceNtrallzedhydrogenproduCtiOn Acrónimo: BIONICO Identities españolas: Fundación TecnaliaResearch&Innovation; Abengoa Hidrogeno, SA Coste total: 3 396 640 € Subvención UE: 3 147 640 €	Fecha de inicio: 01-09-2015 Fecha de finalización: 01-09-2018

Tabla 2:

PROYECTOS SEGÚN EL TEMA DE LA CONVOCATORIA			
Pilar H2020	Título de la convocatoria	Tema	Acrónimo
Excellent Science	Individual Fellowships (IF)	ACEM-IF-2014-GF - Marie Skłodowska-Curie Individual Fellowships (IF-GF)	COUPCAT
		MSCA-IF-2014-EF - Marie Skłodowska-Curie Individual Fellowships (IF-EF)	NANOBIENER
Industrial Leadership	Sustainable Process Industries	SPIRE-02-2014 - Adaptable industrial processes allowing the use of renewables as flexible feedstock for chemical and energy applications	MethCO2 SteamBio
Industrial Leadership	Horizon 2020 dedicated SME Instrument Phase 1 and 2, 2014-2015	SIE-01-2014-1 - Stimulating the innovation potential of SMEs for a low carbon energy system	COSYNAT
Industrial Leadership	Horizon 2020 dedicated SME Instrument Phase 1 and 2, 2014-2015	SC5-20-2014 - Boosting the potential of small businesses for eco-innovation and a sustainable supply of raw materials	DEPURGAN
Societal Challenges	Horizon 2020 dedicated SME Instrument Phase 1 and 2, 2014-2015	SIE-01-2015-1 - Stimulating the innovation potential of SMEs for a low carbon energy system	Enerbox Kurata Systems SMITH
Societal Challenges	Competitive Low-Carbon Energy	LCE-11-2014 - Developing next generation technologies for biofuels and sustainable alternative fuels	ButaNexT
Societal Challenges	Competitive Low-Carbon Energy	LCE-14-2014 - Market uptake of existing and emerging sustainable bioenergy	greenGain Bin2Grid SECURECHAIN
Societal Challenges	Energy Efficiency	EE-13-2014 - Technology for district heating and cooling	FLEXYNETS
Societal Challenges	Bio Based Industries PPP	BBI.VC1.R1 - Efficient pre-treatment of lignocellulosic feedstock to advanced bio-based chemicals and biomaterials	US4GREENCHEM
Societal Challenges	Fuel Cells and Hydrogen 2 Joint Undertaking	FCH-02.2-2014 - Decentralized hydrogen production from clean CO2-containing biogas	BIONICO

# ANÁLISIS DE PATENTES

Durante el segundo trimestre de 2015 se han identificado en la base de datos WPI (World Patent Index) 1.080 familias de patentes sobre tecnologías de conversión de la biomasa para la producción de energía (Tabla 3). El 51,9% de las referencias encontradas están relacionadas con las tecnologías bioquímicas y el 39,9% con las termoquímicas. La tecnología de digestión anaeróbica es la que cuenta con mayor número de resultados, 41,1% de los totales, seguida de la gasificación/pirólisis (25,2%).

Tipos de tecnologías de conversión de la biomasa	2º trimestre. 2015
<b>Tecnologías termoquímicas</b>	<b>431</b>
Combustión directa	159
Gasificación/pirólisis	272
<b>Tecnologías bioquímicas</b>	<b>561</b>
Digestión anaeróbica	444
Fermentación de azúcares	117
<b>Tecnologías químicas (transesterificación, Fischer-Tropsch síntesis de metanol)</b>	<b>88</b>
<b>Nº TOTAL FAMILIAS DE PATENTES</b>	<b>1080</b>

Tabla 3. Número de familias de patentes clasificadas por tecnologías

En la Tabla 4 se muestran los países que han publicado 20 o más documentos de patente en el segundo trimestre de 2015. El país líder es China con 597 documentos de patente, en segundo lugar, y con gran diferencia, le siguen las solicitudes internacionales (PCT). En tercero y cuarto lugar se encuentran EE.UU. y Corea con 90 y 71 documentos, respectivamente. Durante este trimestre en España se han publicado 7 documentos.

	País	Nº referencias
1	China	597
2	PCT	138
3	EE.UU.	90
4	Corea	71
5	Japón	54
6	Brasil	51
7	Alemania	40
8	Rusia	26
9	Francia	22
10	EP	20

Tabla 4. Ranking por países.

# TECNOLOGÍAS TERMOQUÍMICAS

## Patentes

COMBUSTIÓN DIRECTA		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2015080331	Hae Pyo Co Ltd (KR)	<b>Stove using miscanthus sinensis pellets.</b> The present invention relates to a stove using Miscanthus sinensis pellets, more specifically, comprising: a pellet storing/supplying portion which stores pellets inside the upper end of a main body on one side of a center portion, for supplying the pellets to a lower portion by means of gravity, according to control by a pellet discharge control plate, which is installed on the lower portion; a pellet combustion portion which is provided with an adjustable oxygen supply port on the front surface, a combustion material storage portion at the lower end, and which is provided at the lower end side in a direction perpendicular to the pellet storage/supply portion, so that the pellets dropped from the pellet storing/supplying portion are accumulated and combusted; a combustion gas circulation portion comprising, on the inside of the main body, a closed passage, so that heat and combustion gas generated when the pellets are combusted in the pellet combustion portion are circulated around the front surface and side surfaces of the main body, and then discharged through an exhaust port provided on the opposite side of the pellet combustion portion; and an exhaust blower, which is installed at the lower end of the exhaust port, for forcibly introducing outside air so that the combustion gas discharged from the combustion gas circulation portion is smoothly discharged through the exhaust port, wherein a conveyer-type movable grate capable of horizontal and rotational movement by means of driving force, according to a set time and cycle, is installed on the bottom surface of a combustion chamber in the pellet combustion portion, so that the combustion material and clinker can be automatically discharged to the combustion material storage portion at the bottom end.
EP2878890	Nebiolo Polska Sp Z O O (PL)	<b>Pellet feeder for a hot water heating boiler.</b> Pellet feeder for a hot water heating boiler is characterized by that in its feeding chamber it has the insert having two rows of trays separated by a centrally located divider, made of walls planted diagonally on a roller and convergent towards one another at an angle from 45 to 95 degrees, preferably 80 degrees. Rows of trays are dephased in relation to the neighbouring row by the angle of 20 to 50 degrees, preferably 30 degrees. The insert is longer than the width of the opening of the feeding chamber and it is located centrally in relation to it. The opening of the feeding chamber has a cutting edge on its width, joint with the lower edge of the feed hopper, situated favourably in the vertical plane passing through the driving shaft axis.
WO2015075637	Aaco Mfg S R L (IT)	<b>Device for fuel loading into a heating apparatus.</b> A device for loading fuel into a heating apparatus for the actuation thereof, the loading device being associable with the heating apparatus, comprises elements for suctioning fuel, at least one first pipe or conduit designed to connect the suction elements with a container of the fuel and elements for dispensing or discharging the fuel suctioned by the suction elements into the heating apparatus.
EP2878895	Riener Karl Stefan (AT)	<b>Furnace for heat generation.</b> The invention relates to an oven for heat production, in particular wood-fired oven, as Wood burning stove or pellet stove comprising: a combustion chamber, a flue gas guide, is connected with the combustion chamber and the at least one first flue gas section and a second flue gas section, wherein the first flue gas section with a first heat exchanger can be coupled, and the second flue gas section with a second heat exchanger is coupled, and a flue gas guiding means which is adapted to the flue gas selectively into the first and / or second flue gas section to conduc
US2015136109	Baker Edward (US)	<b>Pellet bin insert and storage system for smoker grills.</b> A pellet bin insert system for a wood smoker grill includes a container with an open top, first and second parallel opposing sidewalls, a back wall, a front wall, a bottom surface and an inclined panel affixed around its perimeter to the side walls, the front wall and the bottom surface. The container includes a feeder opening in the bottom surface. A slide bar is slideably coupled to a portion of the inclined panel adjoining the bottom surface and has a bottom end slideably coupled to cover the feeder opening in a first position and to open the feeder opening when moved to a second position. The container is adapted to be inserted into a pellet hopper with the feeder hole aligned to drop pellets into a feeder mechanism when the feeder opening is uncovered.

## COMBUSTIÓN DIRECTA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2015070534	Zhu Hongfeng (CN); et al	<b>Secure biomass fuel stove.</b> A biomass fuel stove comprises a combustion box and an auxiliary device box. The combustion box (10) accommodates a combustor, and the combustor is a horizontally placed cylinder. The cylinder is provided with several through-holes, an inner end of the cylinder is an inner side wall, and the inner side wall is formed with a feeding opening at a location close to the ground direction. The auxiliary device box accommodates a fuel transfer mechanism and an electric device. The fuel transfer mechanism comprises a hopper, a horizontally disposed feeding cylinder and a rotatable fuel spiral pushing rod accommodated in the feeding cylinder. One end of the feeding cylinder is in communication with an outlet below the hopper, and the other end stretches into the combustion box, and passes through a distance to be in communication with the feeding opening on the inner side wall of the combustor. The electric device comprises a feeding motor driving the fuel spiral pushing rod, an air blower capable of blowing air into the combustion box, a fire rod, a power supply and a power supply switch. The stove prevents the feeding cylinder from backfire and catching fire.
WO2015067380	Efilume SL (ES)	<b>Self-cleaning burner.</b> Self-cleaning burner of the type installed in solid fuel boilers, comprising a first tubular body for the supply of fuel connected with a certain incline to a second rectangular body for the intake of primary air, longitudinally divided into an upper passage and a lower passage. The upper passage has a plurality of holes making up the grille in its lower longitudinal portion. The lower passage directs the primary air current necessary for the combustion at the grille. A rotary auger is arranged inside of the upper passage, which has an axis of rotation parallel to the axis of revolution of the aforementioned upper passage, the auger presenting threads having a diameter similar to the internal diameter of the upper passage, the same being adjusted to the internal contour thereof.
ES1137156	Calvo Marcos Alejandro Fidel (ES)	<b>Estufa rústica de biomasa.</b> 1. Estufa rústica de biomasa, caracterizada por estar constituida a partir de una caja paralelepípedica longitudinal de hierro de al menos 4 mm de espesor de perfil, la cual configura el hogar donde se quema el combustible de biomasa, encontrándose en su cara frontal una puerta practicable por bisagras por donde se introduce un quemador extraíble, el cual puede tener una rejilla en la base para el paso de cenizas y un recogedor de cenizas inferior, incorporando dicha puerta una ventana más pequeña también practicable y regulable en su grado de apertura por tornillo regulador de tiro y entrada de aire, y porque sobre la cara superior de dicha caja hogar se encuentra a un lado una tolva de almacenamiento y alimentación de combustible de biomasa y al otro lado una caldera por cuyo interior transcurre una chimenea,; y dentro de ésta otro cilindro para otro circuito de agua, cilíndrica tapada por la parte de arriba para la salida de humo, mientras que por arriba de dicha caldera se encuentra una salida de agua caliente y por debajo una entrada de agua fría para el transporte del agua caliente a radiadores situados en otras estancias de la vivienda. 2. Estufa rústica de biomasa, según reivindicación 1, caracterizada porque la chimenea interior presenta unas pletinas o pestaña transversales repartidas longitudinalmente y alrededor del cilindro interior que ralentizan el paso de los humos, cediendo así más energía al acero, y por consiguiente al agua. 3.; Estufa rústica de biomasa, según reivindicaciones 1 y 2, caracterizada porque en una realización diferente en el interior de dicha chimenea hay una bifurcación de la salida de humos ya sea por medio de tubos, o por un prisma plano
WO2015064878	Social Tech Co Ltd (KR)	<b>Pellet stove for reducing noxious combustion gas.</b> The present invention relates to a pellet stove and, more particularly, to an eco-friendly pellet stove for remarkably reducing CO and NOx by applying a technique for re-introducing combustion gas generated in the pellet stove into a combustion chamber so as to re-burn the combustion gas, thereby implementing the complete combustion of pellets. The present invention provides the eco-friendly pellet stove comprising: a combustion chamber; a combustion gas re-circulation device; an external discharge flue; a fuel tank; and an external air suction device, wherein the structure of the combustion gas re-circulation device has a nozzle of which an inlet is connected to the combustion gas discharge hole of the combustion chamber, the outlet of the nozzle is connected to the external discharge flue, and a combustion gas re-circulation flue is connected to the combustion chamber. In addition, the combustion chamber includes a combustion plate and a sub-combustion plate. Furthermore, the pellet stove further comprises an external case.

## COMBUSTIÓN DIRECTA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2015067233	Rerum Cognito Inst GmbH (DE)	<b>Method for using biomass also in high-temperature processes, and the use of same.</b> The invention relates to a method for using biomass even in high-temperature processes, something which has hardly been possible until now as a result of the fuel-related chlorides in flue gas and the problems of corrosion associated therewith. A solution of this type is primarily required in the energy industry, for open and closed-cycle gas turbine processes, steam-powered operating processes, and in process engineering. Economical energy handling and efficient thermal conversion processes are becoming ever more important in the fight against climate change. Biomass provides a contribution to this, neutrally combusting CO <sub>2</sub> since the assimilation of photosynthesis binds the CO <sub>2</sub> at the same ratio by means of growth. The chlorides contained in the cell structure present a problem as they volatilise during combustion causing large-scale corrosive damage to metal surfaces. However, high temperatures are significant in determining efficiency and biomass should therefore also be usable in high-temperature processes. In order to arrive at combustion chamber temperatures of higher than 1300 DEG C, combustion air and biomass must be pre-heated correspondingly using flue gas. Following separation of the coarse ash, the flue gas passes through a corrosion filter in which easily-exchangeable sacrificial metal surfaces chemically bind the chlorides as far as possible, in order for subsequent stages to be protected.
WO2015057740	Clearsign Comb Corp (US)	<b>Flame visualization control for electrodynamic combustion control.</b> One embodiment is a solid fuel combustion system including a solid fuel support configured to hold a solid fuel for a combustion reaction and a voltage source coupled to the solid fuel support. The solid fuel combustion system further includes a field electrode coupled to the voltage source and disposed in or adjacent to a combustion reaction region above the solid fuel support. The voltage source is configured to output a first voltage signal to the solid fuel support and a second voltage signal to the first field electrode.
EP2853812	MCZ Group SPA (IT)	<b>Improved brazier in particular for pellet stoves.</b> The present invention is relative to an improved brazier to be housed in a combustion chamber of a stove for burning solid fuel in particle or granular form. Said brazier consists of a collecting receptacle for containing the fuel, comprising a bottom wall provided with a plurality of holes for the passage of combustion air, and of one or more side walls. In particular, the brazier comprises at least one cavity provided on a wall of said one or more side walls and configured so as put into fluid communication the area above said brazier and the core of the fuel held in it to form a further combustion air inflow.

## PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2015061833	Crucible Group Pty Ltd (AU)	<b>Converter for organic materials.</b> A continuous converter for pyrolysing or otherwise processing biomass or other solid organic feed materials includes a reaction chamber for producing a solid carbon-containing product and a gas product and optionally a liquid water product via pyrolysis or other reaction mechanisms from a solid organic feed material. The chamber has an inlet for supplying a solid organic feed material to the chamber and separate outlets for the solid carbon-containing product and the gas product produced in the reaction chamber. The inlet and the solid carbon-containing product outlet are configured so that the solid materials in the inlet and in the outlet form respective gas seals in the inlet and the outlet.
WO2015063411	GDF Suez (FR)	<b>Device and method for producing substitute natural gas and network comprising same.</b> The device comprises: - a gasifier for producing a gaseous compound from a biomass, comprising inlets for the biomass and for an oxidising agent and an outlet for the gaseous compound comprising carbon monoxide; - a means for methanating the carbon monoxide to produce substitute natural gas exiting the gasifier, comprising at least one inlet for water and one inlet for the gaseous compound from the gasifier, - a means for methanating carbon dioxide to produce substitute natural gas comprising at least one inlet for water and one inlet for the carbon dioxide, - a means for producing dihydrogen from water and electric current comprising: - a power supply, - an inlet for water and - an outlet for dihydrogen supplying the means for methanating carbon dioxide.

## PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2015058864	Böcker-Riese Bernhard [CH]; et al	<b>Reactor and method for gasification of fuels.</b> The invention relates to a reactor and to a method for gasification of fuels, especially of biomass, in which a muffle pipe disposed within the reactor interior above the grate is provided, and the fuel to be gasified is accommodated therein. The muffle pipe opens into a lower reactor region designed as an autothermal gasification zone, in which the fuel to be gasified is oxidized. The muffle pipe is accommodated with an upper muffle pipe region within an upper reactor region which forms a muffle housing, forming an annular gap which opens into the lower reactor region, in such a way that the gas that enters the annular gap flows along and/or around at least some regions of the upper muffle pipe region with release of heat, such that the latter forms an allothermal gasification zone for heating, pyrolysis and reduction of the fuel to be gasified.
US2015111723	Kior Inc (US)	<b>Refractory mixed-metal oxides and spinel compositions for thermo-catalytic conversion of biomass.</b> A process for biomass catalytic cracking is disclosed herein. More specifically, the process is in presence of a mixed metal oxide catalyst represented by the formula $(X1O).(X2O)_a.(X3YbO4)$ wherein X1, X2 and X3 are alkaline earth elements selected from the group of Mg, Ca, Be, Ba, and mixture thereof, and Y is a metal selected from the group of Al, Mn, Fe, Co, Ni, Cr, Ga, B, La, P and mixture thereof, wherein the catalyst is formed by calcining at least one compound comprising at least one alkaline earth element and a metal element.
WO2015061802	Purdue Research Foundation (US)	<b>Catalytic biomass conversion methods, catalysts, and methods of making the same.</b> Described herein are processes for one-step delignification and hydro-deoxygenation of lignin fraction a biomass feedstock. The lignin feedstock is derived from by-products of paper production and biorefineries. Additionally described is a process for converting biomass-derived oxygenates to lower oxygen-content compounds and/or hydrocarbons in the liquid or vapor phase in a reactor system containing hydrogen and a catalyst comprised of a hydrogenation function and/or an oxophilic function and/or an acid function. Finally, also described herein is a process for converting biomass-derived oxygenates to lower oxygen-content compounds and/or hydrocarbons in the liquid or vapor phase in a reactor system containing hydrogen and a catalyst comprised of a hydrogenation function and/or an oxophilic function and/or an acid function
WO2015054710	Hinterecker Claus (AT); et al	<b>Apparatus and method for gasifying a raw material.</b> The invention relates to a method and to an apparatus for gasifying a raw material, comprising a pyrolysis unit having a reaction chamber for converting the raw material into a product gas, a feeding device by which the raw material can be fed into the pyrolysis unit, a discharge device by which the product gas can be discharged from the pyrolysis unit, and a preheating device for preheating the raw material in the feeding device by means of heat energy from the product gas. The preheating device has a heat absorption unit connected to the discharge device for absorbing heat energy from the product gas, and a heat emission unit connected to the feeding device for emitting heat energy to the raw material in the feeding device. Between the heat absorption unit and the heat emission unit a closed circuit for a heat exchange medium is formed in such a way that the heat exchange medium is vaporised in the heat absorption unit by heat exchange with the product gas, and the heat exchange medium in the heat emission unit is at least partially condensed by heat exchange with the raw materia.
US2015104862	Ineos Usa Llc (US)	<b>Methods for gasification of carbonaceous materials.</b> The present disclosure is generally directed to process of gasification of carbonaceous materials to produce synthesis gas or syngas. The present disclosure provides improved methods of gasification comprising: adding one or more carbonaceous materials, adding a molecular oxygen-containing gas, adding carbon dioxide gas and optionally adding water into said gasifier. This disclosure is also directed to process of production of one or more alcohols from said syngas via fermentation or digestion in the presence of at least one microorganism.

## PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
US9005536	Ark Power Dynamics Llc (US)	<p><b>Apparatus and method for conversion of solid waste into synthetic oil, gas, and fertilizer.</b> Apparatus and method converting feedstock (e.g., chicken litter) into oil, gas, and ash fertilizer has a reformer unit with (i) a feedstock input, (ii) an outer wall, (iii) a reaction chamber with an inner wall, (iv) a combustion gas input, (v) a scrubbing liquid input, (vi) a feedstock stirrer, (vii) an ash stirrer, (viii) an ash plate below the reaction chamber, and (ix) a combined liquid/gas output. The ash plate is separated from the inner wall. Feedstock and scrubbing liquid are preferably reacted within the reaction chamber to release useful hydrocarbon liquids and gasses which migrate to the top of the reformer, while ash from the reaction falls onto the ash plate from where it is output. Liquid/gas pump structure sends the combined liquid/gas from the reformer to gas/liquid separator structure which provides a gas output and a liquid output. The gas output may be used, flamed off, and/or recirculated to the reaction chamber. Oil/water separator structure receives the liquid output and provides a (e.g., scrubbing) water output and an oil output. Processor structure controls the various motors, valves, etc., to control the inputs/outputs and the temperature of the reformer so as to cause an electric current to flow upward along the inner wall and inward toward the reaction product within the reaction chamber to cause arcing in the feedstock; which arcing disassociates molecules into atoms, thus releasing more energy. The oil is refinable, the gas is high in energy content, and the ash fertilizer is high in nitrogen.</p>
WO2015050683	Berberoglu Halil (US); et al	<p><b>Systems and methods for converting biomass to biocrude via hydrothermal liquefaction.</b> Systems and processes of providing novel thermal energy sources for hydrothermal liquefaction (HTL) reactors are described herein. According to various implementations, the systems and processes use concentrated solar thermal energy from a focused high energy beam to provide sufficient energy for driving the HTL biomass to biocrude process. In addition, other implementations convert biowaste, such as municipal biosolids and grease and food waste, to biocrude using anaerobic digesters, and a portion of the biogas generated by the digesters is used to produce the thermal and/or electrical energy used in the HTL reactor for the biomass to biocrude process. Furthermore, alternative implementations may include a hybrid system that uses biogas and solar radiation to provide sufficient thermal energy for the HTL reactor.</p>
WO2015052050	L Air Liquide Société Anonyme Pour L Etude et L Expl Des Procédés Georges Claude (FR)	<p><b>Process for the production of a synthesis gas from carbonaceous fuel with low fixed-carbon content.</b> Process and plant for the production of a synthesis gas containing carbon monoxide and hydrogen from carbonaceous fuel with low fixed-carbon content, wherein upstream of the synthesis gas production a pyrolysis treatment of the fuel is provided in a separate reactor. The invention advantageously is applicable in particular for the gasification of wood, in particular waste wood, as well as biowaste and domestic waste which chiefly consists of biowaste and plastic residues, such as packaging material.</p>
WO2015047085	Biobtx BV (NL); et al	<p><b>Process for the preparation of aromatic compounds.</b> Aromatic compounds are prepared from a feed stream comprising biomass or a mixture of biomass and synthetic polymer in a process, comprising: a) subjecting the feed stream to a pyrolysis treatment in the presence of a cracking catalyst to yield a vaporous fraction comprising hydrocarbons with olefinic unsaturation and oxygen containing organic compounds and coke-laden cracking catalyst; b) separating the vaporous fraction from the coke-laden cracking catalyst; c) contacting the vaporous fraction with a second, aromatization catalyst in a conversion treatment to yield a conversion product comprising aromatic compounds; and d) recovering aromatic compounds from the conversion product, wherein the cracking catalyst is a naturally occurring material, selected from the group consisting of inorganic salts, refractory oxides, minerals, industrial rock and mixtures thereof.</p>

## PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
W02015056214	Suez Environnement (FR)	<b>Process and unit for recovering energy from waste.</b> A process for recovering energy from waste, comprising a step of incinerating the waste in a furnace (H) for the production of thermal energy; gasification of high NCV waste is carried out so as to produce a syngas, and this syngas is injected into the combustion chamber (6) of the furnace, such that, for the same flow by mass of waste introduced into the furnace, the injection of syngas makes it possible to achieve a higher power of the furnace without increasing the flow by mass of waste introduced.
EP2860450	Bak Tadeusz (PL)	<b>A method for thermal processing of organic waste and a system for thermal processing of organic waste.</b> A method for thermal conversion of waste characterized in that the waste is processed in a mineraliser in a form of a substantially longitudinal, rotatable tube with fixed an/or adjustable elements located therein for scattering a material during the rotation of the tube, whereas in the mineraliser there commences a continuous process of gasification of a batch material takes place, and wherein the batch material is transformed into a hot post-reaction gas and inorganic waste whereas during the mineralization process there is monitored the content of carbon oxide (CO) and hydrogen (H <sub>2</sub> ) in the post-reaction gas and there is set an amount of the gasification agent input to the mineraliser so as to maximize the content of the carbon oxide (CO) and hydrogen (H <sub>2</sub> ); in the post-reaction gas and to keep the temperature of the post-reaction gas in the range from 300 DEG C to 700 DEG C, after which the post-reaction gas is input to a catalytic gas purification installation, in which in the catalytic reactor there is introduced oxygen into the post-reaction gas, and subsequently the purified gas is input to an installation for generation of electricity and/or heat.
ES2533141	Huguet I Farré Jordi (ES)	<b>Method for the elimination of plastic contained in urban and industrial waste, and facility for implementing same.</b> The process for eliminating plastic contained in urban and industrial waste is based on performing a pyrolysis of the previously prepared plastic materials in such a way that, in this pyrolysis, hydrocarbons are produced in the form of gas and liquid hydrocarbons, the gases being treated in a washing system, from which the washed gases pass through a dehumidifier before being driven towards a gas accumulation gasometer, while the solid waste or liquid hydrocarbons resulting from the washing process are sent for the corresponding treatment for separating the water from the hydrocarbon remainder.
US2015090164	Engel Thomas Wolfgang (US)	<b>Solid fuel burner-gasifier methods and apparatus.</b> A system for thermally processing solid fuel to produce pyrolysis gases, syngas, tar, char, and/or torrefied products, which includes a bulk solids pump having a curved passage to move a feedstock therein and wherein the pump includes a spool supported for rotational movement. A sleeve shaped chamber or chambers surround all or a portion of at least an axial extent of said curved passage to permit containment of heated gases to heat solid fuel within the curved passage to thermally process the feedstock within the pump.

# TECNOLOGÍAS BIOQUÍMICAS

## Patentes

DIGESTIÓN ANAERÓBICA		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2015073963	Quality Flow Inc (US)	<b>Manure treatment process with anaerobic digester.</b> A process is provided for converting waste fibers to solid fuel. The process includes providing a supply of animal waste including the waste fibers in a predetermined quantity, subjecting the supply of animal waste to anaerobic digestion, producing a waste byproduct, dewatering the waste byproduct, and compressing the dewatered waste byproduct to form briquettes.
WO2015071575	Air Liquide (FR)	<b>Method for producing biomethane incorporating the production of heat for the methaniser using membrane separation.</b> The present invention concerns a method for producing biomethane suitable for supplying a natural gas network incorporating a method for supplying heat in order to heat the step of producing biogas, the method comprising at least steps of producing biogas by anaerobic fermentation of organic material, pretreating and compressing the biogas, and permeation in order to obtain, after a first separation by permeation, a flow of biomethane and a gaseous permeate with a reduced methane content; the method further provides the heat required for the step of anaerobic fermentation via a boiler using the retentate from a second permeation step fed by the permeate from the first separation.
US2015132810	Coskata Inc (US); et al	<b>Integrated processes for anaerobically bioconverting hydrogen and carbon oxides to oxygenated organic compound.</b> Integrated processes are provided for the bioconversion of syngas to oxygenated organic compound with the ability to recover essential compounds for the fermentation and recycle the compounds to the fermentation.
ES2529380	Ind Danalu SL (ES)	<b>Biodigestor en línea o túnel continuo de mezcla separada para la producción de biogás.</b> a invención consiste en un biodigestor en línea o túnel continuo de mezcla separada para la producción de biogás que cuenta en cada uno de sus extremos con una puerta y una precámara. El material es transportado en vagones. Las vagones que transportan la materia a digerir, previamente tratada, entra a través de una de estas puertas al interior siguiendo unas guías que permiten posicionarlas correctamente. La vagoneta avanza de forma diaria a la siguiente posición de forma que al finalizar el periodo de biodigestión, la vagoneta se encuentre al final del biodigestor y el efluente resultante pueda pasar a la siguiente zona en la que será convenientemente tratado.; El biogás generado se concentra en la cámara superior del túnel y posteriormente se transporta al correspondiente depósito para su almacenamiento, el biogás obtenido puede usarse para generar energía eléctrica y/o térmica.
EP2871231	Senzyme GmbH (DE)	<b>Method for generating biogas.</b> Producing biogas in a biogas reactor, comprises: providing at least a quantitative deficit feature, based on the biomass of a specific biogas reactor; indicating at least one measurement method for the measurement of at least one deficit feature; determining at least one reference value for at least one deficit feature; and producing biogas in the biogas reactor; determining at least one value of at least one deficit feature in the biomass from the biogas reactor by at least one measurement method; providing at least one quantitative selection criterion for selecting at least one enzyme-containing preparation from at least two enzyme-containing preparations; and adding the enzyme-containing preparations at least in an amount or for a period of biomass in the biogas reactor, until the measured error disappears, if the determined deficit feature value in the biomass of at least one determined and provided guideline differs.

## DIGESTIÓN ANAERÓBICA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2015063167	Universität Ros-tock (DE)	<b>Biogas plant with biocarbon-filter arrangement.</b> The invention concerns a biogas plant comprising at least one biogas reactor in which a gaseous product is prepared, and at least one filter arrangement which is able to filter useful material out of the gaseous product from the biogas plant and/or from the at least one biogas reactor, the filter arrangement comprising biocarbon which is able to accumulate useful material. The invention also concerns corresponding arrangements and methods.
WO2015067619	Carbios (FR)	<b>A method for degrading a plastic.</b> The present invention relates to a method for degrading a plastic containing non-biodegradable polymers comprising submitting said plastic to at least one enzyme for modifying a polymer of said plastic which has a methane potential less than 5 Nm <sup>3</sup> /t +/- 20%, wherein at least one product resulting from the modification exhibits a methane potential greater than 10 Nm <sup>3</sup> /t +/- 20%.
US2015118723	Duzoglou Derek Christopher (US)	<b>Apparatus and method for generating eco-conscious products from waste.</b> An assembly for generating eco-conscious products from waste uses an anaerobic digester for anaerobically processing waste matter to produce anaerobic products selected from the group of products consisting of biogas, liquid digestate, solid digestate, and mixtures thereof One or more eco-assemblies receive the anaerobic products to generate at least one eco-conscious product. The eco-assemblies include one or more of an eco-matrix molder, an algae cultivator, a fast-pyrolysis chamber, a soil enhancer, a RDF pelletizer, and a hydroponic apparatus. A method is provided for generating eco-conscious products from waste by anaerobically processing waste matter to produce one or more of the anaerobic products, which are conveyed to one or more eco-assemblies to generate at least one eco-conscious product.
WO2015067745	Uts Biogastechnik GmbH (DE)	<b>Agitating device for a fermenter of a biogas plant and method for producing an agitating device.</b> The invention relates to a fermenter comprising an agitating device, an agitating device and to a method for producing an agitating device, said agitating device comprises several agitator blades, said agitator blades having a plurality of blades section which are angled with respect to each other. Said blade sections of the agitator blades are angled with respect to each other such that the gradient of the agitator blades decreases with an increasing distance from a central rotational axis in order to form three-dimensional, flow-effective agitator blades.
US2015122120	Stensland Geoffrey Lawrence (US)	<b>Hydrogen sulfide control in biodigestion processes.</b> Systems and methods for removing hydrogen sulfide from biogas resulting from anaerobic digestion of biodegradable waste utilize scrubbing vessels with pressure release devices to vent biogas when necessary to avoid over pressurization of the digesters. Use of iron containing sulfide scavengers in the digesters is avoided which avoids the disposal costs associated with iron containing sludge and the regular need to shut down the digesters to remove scale.
WO2015058212	Lanzatech New Zealand Ltd (NZ); et al	<b>Microbial conversion of methane.</b> This invention relates to a process for producing lipids and amino acids from a gaseous substrate comprising methane and oxygen. The process uses a culture of a methanotrophic microorganism in a liquid nutrient medium. The methanotrophic microorganism can be a Methylo-microbium bacterium and more specifically Methylo-microbium buryatense 5GB1. The lipid products can be in the cellular membrane of the methanotroph and can be extracted in a separate extraction zone.
WO2015054783	Her majesty the Queen in Right of Canada as represented by the Minister of Agriculture and Agri Food (CA)	<b>Psychrophilic anaerobic digestion of ammonia-rich waste.</b> The present description relates to a process for the psychrophilic anaerobic digestion of ammonia-rich waste, such as farm manure or municipal waste, comprising the steps of contacting the ammonia-rich waste to an inoculum comprising anaerobic bacteria in a digester and reacting the ammonia-rich waste with the inoculum at a temperature below 25 DEG C to allow digestion of the ammonia-rich waste.

## DIGESTIÓN ANAERÓBICA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2015053417	Annabini Tez Corp (KR)	<p><b>Anaerobic digestion apparatus appropriate for treating organic waste material.</b> The present invention relates to an anaerobic digestion apparatus and provides an anaerobic digestion apparatus comprising: a load-balancing tank for storing and mixing an organic waste material to be processed while controlling so that specific concentration and flow rate are maintained; an anaerobic digestion tank for receiving organic waste material from the load-balancing tank, generating biogas, and carrying out an anaerobic digestion step; an anaerobic digestion tank-discharged water storage tank for storing discharged water that is discharged from the anaerobic digestion tank; a microbe-concentrating device for receiving discharged water from the anaerobic digestion tank-discharged water storage tank and condensing aerobic microbes contained in the discharged water; a stabilizer tank for receiving liquid concentrated in the microbe-concentrating device and stabilizing the conditions of the microbes contained in the concentrated liquid; at least one nitrogen control tank for supplying nitrogen-free water to at least one of the load-balancing tank, the anaerobic digestion tank, and stabilizing liquid discharged from the stabilizer tank; a sludge flowrate control tank, which is connected to the anaerobic digestion tank-discharged water storage tank, the microbe-concentrating device, and the stabilizer tank and receives anaerobic digestion tank-discharged water, concentrated liquid, and stabilizing liquid therefrom, respectively, and discharging same to a coagulation reaction tank for a post-treatment process while controlling the flow rate of the sludge; and a mesh portion connected between the anaerobic digestion tank and the anaerobic digestion tank-discharged water storage tank, for catching inorganic solid substances included in the anaerobic digestion tank-discharged water.</p>
WO2015044721	Desert Bioenergy (CL)	<p><b>Microalgae biorefinery for biofuel and valuable products production.</b> The invention relates to downstream processing of microalgal biomass to produce different products in a biorefinery process. The invention establishes interconnected stages from harvesting of microalgal biomass, following several productive processes, including alternatives to use the remaining biomass. The invention allows improving the overall downstream process by adapting each stage of the production process for a complete microalgal biomass use producing various added-value products of commercial interest: proteins, biodiesel, and biogas or biomethane. In addition, the invention includes wastewater reutilization alternatives to be reused in the same processes. The invention has application in processing biomass such as microalgae and other biomass types, for the production of biofuels and co-products.</p>
US2015099287	Panasonic Corp (JP)	<p><b>Biogas generation system and method for generating biogas and carbon dioxide reduction product using the same.</b> Provided is a biogas generation system comprising a fermenter for generating a biogas containing carbon dioxide and methane by decomposing an organic waste by the action of methane bacteria; a biogas refinery for condensing the methane contained in the biogas by dissolving the carbon dioxide contained in the generated biogas in a liquid; and a photoelectrochemical device for generating methane, carbon monoxide, or formic acid from the carbon dioxide dissolved in the liquid. The photoelectrochemical device comprises a cathode chamber for storing a first electrolyte solution containing the carbon dioxide dissolved in the liquid; an anode chamber for storing a second electrolyte solution; a solid electrolyte membrane; a cathode electrode provided in the cathode chamber; an anode electrode provided in the anode chamber; and an external power supply for applying a negative voltage and a positive voltage to the cathode electrode and the anode electrode, respectively.</p>

## FERMENTACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2015081331	Lanzatech New Zealand Ltd (NZ); et al	<b>Methods and systems for improving fermentation efficiency.</b> Processes, as well as associated systems, are disclosed for biological conversion of CO into desired end products such as ethanol and 2,3-butanediol. The pre-treatment of industrial gas streams comprising CO, such that the level of contaminants selected from the group comprising benzene, toluene, xylene and ethylbenzene, are maintained below a predetermined liquid level in the fermentation broth, has been shown to have positive effects on the fermentation process.
WO2015075391	IFP Energies Nouvelles (FR); et al	<b>The present invention relates to the expression and optimisation of enzymes involved in the breakdown of lignocellulosic biomass.</b> The present invention relates more specifically to variants of <i>Trichoderma reesei</i> endoglucanase I, and the use of said variants having an improved performance in methods of breaking down cellulose and producing biofuel.
WO2015075316	Teknologian Tutkimuskeskus VTT (FI)	<b>Method for cultivating yeast in lignocellulosic hydrolysate.</b> This invention relates to a method for cultivating yeast in lignocellulosic hydrolysate and methods of improving yeast viability and/or metabolic activity when cultivated on medium comprising lignocellulosic hydrolysate or in a culture medium comprising lignocellulosic hydrolysate or in other formic and acetic acid containing media. The method comprises that yeast is made deficient of a gene encoding the plasma membrane transporter Pdr12 or its homologue. The invention relates also to the yeast culture and modified yeast host. The invention improves production of desired products on lignocellulosic or acidic medium.
WO2015059656	Commissariat Energie Atomique (FR)	<b>Process for producing an organic product from a carbon-based matter feedstock using gasification followed by fermentation of the synthesis gas.</b> The invention relates to a process for producing a fuel, in particular a liquid fuel, or another organic product, from a carbon-based matter feedstock, comprising the following steps: a/ gasification of the carbon-based matter feedstock in a first reactor, termed gasifier, b/ downstream of the gasification, fermentation of the synthesis gas produced according to step a/, by means of microorganisms, water and nutrients in a second reactor, termed fermenter, c/ recovery, downstream of the fermenter, of the microorganisms and of the water, d/ injection of at least a part of the recovered microorganisms and, where appropriate, of at least a part of the recovered water at the inlet of the gasifier.
WO2015069308	Purdue Research Foundation (US); et al	<b>Termite superoxide dismutases and glutathione peroxidases for biomass conversion.</b> The present disclosure is generally related to enzymes, and to recombinant nucleic acid molecules encoding and/or expressing said enzymes, of the gut of the termite <i>Reticulitermes flavipes</i> . The disclosure further relates to a system combining said enzymes for substantially converting a plant lignocellulose to a fermentable sugar-based product.
WO2015066492	Novozymes AS (DK); et al	<b>Methods of saccharifying and fermenting a cellulosic material.</b> The invention relates to methods of saccharifying a cellulosic material comprising subjecting the cellulosic material to a catalase and a cellulolytic enzyme composition comprising a GH61 polypeptide in the presence of dissolved oxygen at a concentration of greater than 10% of the saturation level. The invention also related to methods of producing desired fermentation products, such as ethanol, using a method including a saccharification step of the invention.
WO2015057843	Cellulosic Ethanol Technologies LLC (US)	<b>Process and system for high solids fermentation.</b> A process and system for producing ethanol from a biomass feedstock is provided that improves ethanol production by using a biomass feedstock containing high amounts of solids and starch. The process can involve subjecting the biomass feedstock to a primary fermentation to produce a whole stillage and subjecting this whole stillage to a secondary fermentation. The processes and systems described herein can maximize the amount of ethanol produced in ethanol production facilities.

## FERMENTACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2015057148	Scandinavian Technology Group AB (SE)	<b>Saccharomyces cerevisiae strains.</b> The present invention relates to a method of preparing a strain of sugar fermenting <i>Saccharomyces cerevisiae</i> with capability to ferment xylose, and to the use of said prepared strains of the invention for fermentation of sugar containing biomass hydrolysates to ethanol. The method comprises mating a first sporulated <i>Saccharomyces cerevisiae</i> strain with a second <i>Saccharomyces cerevisiae</i> haploid strain. Thereafter, screening for mated cells is performed, growing such mated cells, and verifying that mated cells exhibit basic morphology by microscopic inspection. Thereafter, creation of a mixture of the mated cells is performed, subjecting the mixture to continuous chemostat cultivation and obtaining the sugar fermenting <i>Saccharomyces cerevisiae</i> cells with capability to ferment xylose is performed. The invention also comprises strains obtained by said method.
WO2015057517	Danisco Us Inc (US)	<b>Use of hemicellulases to improve ethanol production.</b> Described are compositions and methods comprising the use of hemicellulases at a level above a certain threshold to improve and increase the production yield of ethanol from grains.
WO2015056267	Algalo Ind Ltd (IL)	<b>Algae growth system and method.</b> There is provided an Algae growth system which combines the advantages of closed systems with the simplicity and low costs of open systems, the system having a transparent photo-bioreactor device which has a pair of longitudinal, flat, transparent side walls, a curved base connecting the bottom edges of the pair of flat side walls parallel to each other, a pair of rounded, corner-less end walls, connecting and sealing the side edges of the pair of flat side walls, an air tube extending along said curved base, a lid situated on the top edges of the pair of flat side walls and an outlet formed in one end of the curved base wall for drainage of the bioreactor, and a blowing means for providing air flow, wherein the blowing means provides the air flow through a medium in said bioreactor, for developing a vortex in the medium containing the algae, thereby preventing sinking of Algae and causing them to be uniformly exposed to light. Recently, algae are used for the production of ethanol (fermentation) or biodiesel (conversion)
US2015104842	Du Pont (US)	<b>Fuel compositions containing lignocellulosic biomass fermentation process syrup.</b> A solid lignocellulosic fuel composition is produced from combining the syrup co-product of a lignocellulosic biomass fermentation process and an additional fuel component. The syrup is an excellent binder for a powdery fuel material that is not readily handled. The fuel composition is further processed to form briquettes, pellets and the like.
WO2015053364	Nippon Steel & Sumikin Eng Co (JP)	<b>Ethanol production facility, ethanol production method, and facility for producing ethanol and biopellets.</b> This ethanol production facility comprises: a crushing device that crushes soft cellulose including starch, to produce a crushed product; a saccharification-and-fermentation device in which the crushed product is saccharified and fermented by adding an enzyme and a yeast into the same tank that contains the crushed product, to produce a saccharified-and-fermented product; a juicing device that juices the saccharified-and-fermented product, to produce a juiced liquid; and a distillation device that distills the juiced liquid, to obtain ethanol.

# TECNOLOGÍAS QUÍMICAS

## Patentes

Nº Publicación	Solicitante (País)	Contenido técnico
US2015132812	Genifuel Corp (US)	<b>Two-stage process for producing oil from microalgae.</b> 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.
US2015125913	WB Technologies Llc (US)	<b>Integrated ethanol and biodiesel facility.</b> An integrated facility for the co-production of ethanol and biodiesel fuel is provided. Ethanol and corn oil, the primary product and a by-product from the ethanol plant, are utilized as feedstocks for a biodiesel plant operating within the same general facility as the corn ethanol plant. By-products of the biodiesel plant, principally crude liquid glycerol and gaseous ethanol or methanol, are recycled to various parts of the ethanol plant.
WO2015079117	Kemira OYJ (FI)	<b>Method for enzyme recovery in biofuel production process.</b> The invention relates to a method for enzyme recovery in biofuel production process. The method comprises steps of producing, by using liquid enzymes, an intermediate product mixture comprising a top phase comprising fatty acid esters and a bottom phase comprising glycerol; adding cationic polymer and an anionic surfactant or non-ionic surfactant to the intermediate product mixture; allowing an emulsion phase to form, the emulsion phase comprising liquid enzymes; and separating the emulsion phase from the intermediate product mixture.
US2015119611	GEN ELECTRIC (US)	<b>Bio-Diesel Blending System.</b> The present application provides a bio-diesel blending system for blending a flow of a bio-diesel fuel with a flow of a second fuel. The bio-diesel blending system may include one or more second fuel skids with the flow of the second fuel, a bio-diesel tank with the flow of the bio-diesel fuel, a bio-diesel skid in communication with the bio-diesel tank, and one or more blending lines in communication with the bio-diesel skid and the second fuel skids for in-line blending of the flow of the bio-diesel fuel and the flow of the second fuel to form a blended flow.
EP2862915	Univ Rigas Tehnis-ka (LV)	<b>Method for manufacturing biodiesel.</b> The present invention relates to the production and utilization of fuel for internal combustion engines and heating devices, in particular on such a renewable fuel production and utilization, of which main ingredient is a mixture of fatty acid methyl esters, and are commonly called biodiesel. The method for the production of biodiesel from plant oil in one stage with simultaneous glycerol conversion into its derivatives is proposed, where methyl acetate as reagent is used, and sodium methoxide solution in methanol as catalyst is used.
WO2015059063	Basf SE (DE)	<b>use of a complex ester to reduce fuel consumption.</b> The use of a complex ester obtainable by esterification reaction between aliphatic linear or branched C2- to C12-dicarboxylic acids, aliphatic linear or branched polyhydroxy alcohols with 3 to 6 hydroxyl groups, and, as chain stopping agents, aliphatic linear or branched C1- to C30- monocarboxylic acids or aliphatic linear or branched monobasic C1- to C30-alcohols, as an additive in a fuel for reducing fuel consumption in the operation of an internal combustion engine with this fuel.
ES2527885	Repsol SA (ES)	<b>Microorganism of the genus tetraselmis and the use thereof for the production of biofuels.</b> The present invention relates to a microorganism belonging to the Tetraselmis suecica microalgae species with Spanish Algae Bank access number BEA D01_11. Furthermore, the present invention relates to the use of this strain for the production of biofuels and also to the method for producing said biofuels.

Nº Publicación	Solicitante (País)	Contenido técnico
WO2015056767	Nat Inst of Advanced Ind Scien (JP)	<b>method for producing high quality biodiesel fuel.</b> The purpose of the present invention is to provide a method for producing a high quality biodiesel fuel having excellent oxidation stability and few low-temperature deposits. This purpose can be achieved by the following: hydrogenating a biodiesel fuel so as to selectively convert unsaturated fatty acid monoglycerides and then removing fatty acid monoglycerides through precipitation; or using an adsorbent to further remove fatty acid monoglycerides to a high degree from the biodiesel fuel produced using the method mentioned above.
WO2015046736	Advanced Biomass R & D CT (KR)	<b>Method for directly producing high-energy biodiesel from wet biomass.</b> The present invention relates to a method for directly producing biodiesel from wet biomass by performing alcohol pretreatment and applying alcohol, catalyst, and heat to the pretreated biomass, without a separate lipid extraction procedure. The method of the present invention is more cost-effective than existing methods by not employing a lipid separation process, and improved the processes so that the waste generated during the processing process can be recycled, and thus an eco-friendly effect may be expected.
WO2015050656	Inventure Renewables Inc (US)	<b>Methods and industrial processes for the generation of free fatty acids derivatives thereof from oil gums.</b> This invention generally relates to the generation of free fatty acids and/or derivatives thereof, e.g. fatty alkyl esters, and/or fatty amides, from feedstocks comprising phospholipids. In alternative embodiments, the invention provides methods and industrial processes for generating free fatty acids and/or fatty acid derivatives from a feedstock comprising phospholipids by combining the feedstock with one or more reactants to form a reaction mixture and reacting the mixture at a temperature and pressure sufficient to provide for the separation of the free fatty acids from their phosphatide structures.

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# VT BIOMASA

## PATENTES

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