VT BIOMASA PATENTES
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28
Vigilancia Tecnológica
2º trimestre 2018

BIOENERGÍA A PARTIR DE RESIDUOS GANADEROS: PROYECTOS EUROPEOS

Con el fin de complementar el análisis bibliométrico desarrollado en el Boletín anterior sobre el aprovechamiento energético de residuos ganaderos y obtener una visión más amplia de cómo la Unión Europea (UE) apoya la valorización energética de este recurso, en este Boletín se recogen los proyectos financiados por la UE que se encontraban vigentes en el año 2017. Para su identificación se usaron las bases de datos europeas CORDIS y Life +.

Mushroom and biogas production in a circular economy	
Duración: 2017-08-01 a 2019-07-31	**Financiación:** Horizon2020
Participantes: • **Coordinador:** Advanced Substrate Technologies AS (Dinamarca) • Panbo Systems BV (Holanda)	

Biofrigas: Turning manure into fuel: a container based LBG plant for small to medium scale farms	
Duración: 2017-04-01 a 2017-04-30	**Financiación:** Horizon2020
Participantes: • **Coordinador:** Biofrigas Sweden AB (Suecia)	

UltraBio: Recovery of nutrients from agricultural residues and improved dewatering through ultrasound technology	
Duración: 2017-02-01 a 2017-07-31	**Financiación:** Horizon2020
Participantes: • **Coordinador:** Weber Entec GmbH & CO. KG (Alemania)	

KUDURA: Upscaling of a portable hybrid solution for power supply, smart waste-to-energy	
Duración: 2017-02-01 a 2017-05-31	**Financiación:** Horizon2020
Participantes: • **Coordinador:** RVE.SOL - Solucoes de Energia Rural LDA (Portugal)	

Biowave: Upscale and demonstration of a integrated novel microwave pre-treatment system for efficient production of biogas from anaerobic digestion of pig manure to create a sustainable waste management system	
Duración: 2016-04-01 a 2018-07-31	**Financiación:** Horizon2020
Participantes: • **Coordinador:** Ashleigh Farms (Environmental) Limited (Irlanda) • Sairem Societe Pour L Application Industrielle De La Recherche En Electronique Et Micro Ondes Sas (Francia) • Technosam SRL (Rumania) • Methan O'gen Limited (Reino Unido) • Gilmore & Clarke (Electrical) Limited (Irlanda)	

BiogasAction: Promotion of sustainable biogas production in EU	
Duración: 2016-01-01 a 2018-12-31	**Financiación:** Horizon2020

Participantes:
- **Coordinador:** Energy Consulting Network APS (Dinamarca)
- European Biogas Association (Bélgica)
- Dansk Fagcenter for Biogas (Dinamárca)
- Auvergne-Rhone-Alpes Energie Environnement (Francia)
- Cornelissen Consulting Services BV (Holanda)
- IBBK Fachgruppe Biogas GmbH (Alemania)

H2AD-aFDPI: H2AD - Innovative and scalable biotechnology using Microbial Fuel Cell and Anaerobic Digestion for the treatment of micro-scale industrial and agriculture effluents to recover energy from waste	
Duración: 2015-11-01 a 2017-10-31	**Financiación:** Horizon2020

Participantes:
- **Coordinador:** Lindhurst Engineering Limited (Reino Unido)

DEPURGAN: Swine-farm revolution	
Duración: 2015-09-01 a 2017-09-30	**Financiación:** Horizon2020

Participantes:
- **Coordinador:** Eurogan SL (España)

ADD-ON: A demonstration plant of enhanced biogas production with Add-On technology	
Duración: 2015-03-01 a 2018-07-31	**Financiación:** Horizon2020

Participantes:
- **Coordinador:** Ductor OY (Finlandia)

BIFFIO: Cooperation between the aquaculture and agriculture sectors with the intent to use animal manure and fish faeces for sustainable production and utilization of renewable energy and recovered nutrients	
Duración: 2013-11-01 a 2017-01-31	**Financiación:** Horizon2020

Participantes:
- **Coordinador:** Teknologisk Institutt AS (Noruega)
- Landberatung Niedersachsen GmbH Landwirtschaftliche Beratungs- und Dienstleistungsgesellschaft (Alemania)
- Norsk Bioenergi Forening (Noruega)
- Scottish Salmon Producers' Organisation Limited (Reino Unido)
- British Trout Association LTD IPS (Reino Unido)
- Association europeenne pour la biomasse (Bélgica)

AGROPTI-GAS: Demonstration of an optimised production system for biogas from biological waste and agricultural feedstock	
Duración: 2016-10-01 a 2019-12-31	**Financiación:** FP5-Quinto Programa Marco

Participantes:
- **Coordinador:** Municipality of Vaexjoe (Suecia)
- Bulgarian Association of Investors (Bulgaria)
- Federal Agricultural Research Centre (Alemania)
- Lantbrukarnas Ekonomi AB (Suecia)
- Stiftelsen JTI - Institutet foer Jordbruks- Och Miljoeteknik (Suecia)
- Svensk Vaxtkraft AB (Suecia)

LIFE AMMONIA TRAPPING: Development of membrane devices to reduce ammonia emissions generated by manure in poultry and pig farms	
Duración: 2016-10-01 a 2019-09-30	**Financiación:** Life

Participantes:
- **Coordinador:** Fundación General de la Universidad de Valladolid (España)
- Desarrollos Porcinos de Castilla y León (España)
- Instituto Tecnológico Agrario de Castilla y León (España)
- Universidad de Valladolid (España)
- Avicola Ciria S.L. (España)
- Ingenieria y Desarrollos Renovables S.L. (España)
- Enusa - Industrias Avanzadas S.A. (España)
- Explotación Porcina Integral S.A. (España)

LIFE LEMNA: Duckweed technology for improving nutrient management and resource efficiency in pig production systems	
Duración: 2016-10-01 a 2019-12-31	**Financiación:** Life

Participantes:
- **Coordinador:** Asociación de Investigación de la Industria Agroalimentaria- AINIA (España)
- CSIC (España)
- Explotación Porcina Integral S.A. (España)

LIFE DOP - LIFE DOP - Demonstrative mOdel of circular economy Process in a high quality dairy industry	
Duración: 2016-09-01 a 2021-03-01	**Financiación:** Life

Participantes:
- **Coordinador:** Consorzio Latterie Virgilio (Italia)
- Consorzio Export 3P (Italia)
- Cooperativa San Lorenzo Soc. Agr. Coop. (Italia)
- Università degli Studi di Milano (Italia)
- Associazione Mantovana Allevatori (Italia)
- Consorzio Agrario del Nord Est (Italia)

LIFE-CHIMERA - CHIMERA – CHIckens Manure Exploitation and RevAluation	
Duración: 2016-07-01 a 2019-12-31	**Financiación:** Life

Participantes:
- **Coordinador:** Tre P Engineering SRL (Italia)
- Renders & Renders V.O.F. (Holanda)

LIFE STO3RE - Synergic TPAD and O3 process in WWTPs for Resoruce Efficient waste management	
Duración: 2015-09-01 a 2018-12-31	**Financiación:** Life

Participantes:
- **Coordinador:** Sociedad de Fomento Agrícola Castellonense, S.A. (España)
- CSIC (España)
- IPROMA (España)
- AINIA (España)
- ESAMUR (España)

LIFE Smart Fertirrigation - Integrated pig manure digestate processing for direct injection of organic liquid fertiliser into irrigation system	
Duración: 2015-09-01 a 2018-12-31	**Financiación:** Life

Participantes:
- **Coordinador:** Copiso Soria (España)
- Dorset Agrar- und Umwelttechnik GmbH (Alemania)
- Bosman Watermanagement International B.V. (Holanda)
- Comunidad de Regantes de Canal de Almazán (España)
- Transfer Latin Business Consultancy S.L (España)
- Purines Almazán S.L (España)

LIFE METHAmorphosis - Waste streams treatment for obtaining safe reclaimed water and biomethane for transport sector to mitigateGHG emissions

Duración: 2015-07-16 a 2019-06-30 | **Financiación:** Life

Participantes:
- **Coordinador:** FCC Aqualia (España)
- Gas Natural SDG (España)
- SEAT(España)
- Área Metropolitana de Barcelona (España)
- Instituto Catalán de la Energía (España)
- Fomento de Construcciones y Contratas, S.A. (España)

LIFE+ VALPORC: Valorization of pig carcasses through their transformation into biofuels and organic fertilizers

Duración: 2014-09-01 a 2017-08-31 | **Financiación:** Life

Participantes:
- **Coordinador:** Asociación de Defensa Sanitaria Nº 2 Comarcal Porcino (España)
- IBEROIL Transformados S.L. (España)
- CARTIF(España)
- Corporación Proteica Animal, S.A.U (España)

LIFE+Farms for the future-Farms for the future: Innovation for sustainable manure management from farm to soil

Duración: 2013-09-10 a 2018-03-09 | **Financiación:** Life

Participantes:
- **Coordinador:** Departamento de Agricultura, Ramaderia, Pesca, Alimentació i Medi Natural de la Generalitat de Catalunya (España)
- Agència de Residus de Catalunya (España)
- Centre De La Propietat Forestal (España)
- Instituto de de Investigaciones y Tecnologías Agroalimentarias (España)
- Fundació Mas Badia (España)

LIFE-OPTIMAL2012: OPTImised nutrients MAnagement from Livestock production in Alto Adige

Duración: 2013-07-01 a 2018-12-31 | **Financiación:** Life

Participantes:
- **Coordinador:** Biogas Wipptal SRL (Italia)
- Cantina Tramin-Società Agricola Cooperativa (Italia)
- N-Free Service SRL (Italia)
- Libera Università di Bolzano (Italia)
- Università degli Studi di Torino (Italia)
- Zunhammer GmbH (Alemania)

LIFE BIOGAS XPOSE - LIFE BIOGAS XPOSE - Maximized biogaspotential from resource innovation in the Biogas Öst region

Duración: 2013-07-01 a 2018-06-29 | **Financiación:** Life

Participantes:
- **Coordinador:** Vafab Miljö AB (Suecia)
- Biogas Öst AB (Suecia)
- Cortus AB (Suecia)
- Institutet för Jordbruks- Och Miljöteknik AB (JTI) (Suecia)
- NeoZeo AB (Suecia)

ANÁLISIS DE PATENTES

En el segundo trimestre de 2018 se han identificado en la base de datos WPI (World Patent Index) 255 familias de patentes sobre tecnologías de conversión de la biomasa para la producción de energía, excluyéndose las invenciones con ámbito de protección exclusivamente asiático. Cabe señalar que el 73.3% de las familas se refiere a tecnologías termoquímicas. El 21.6% y el 10.2% hacen referencia a tecnologías bioquímicas y químicas, respectivamente. La tecnología de pirólisis/gasificación es la que cuenta con mayor número de resultados, 40.0% del total, seguida de la de combustión, con el 34.1% (Tabla 2).

Tipos de tecnologías de conversión de la biomasa	Nº Familias
Tecnologías termoquímicas	187
Combustión directa	87
Gasificación/pirólisis	102
Tecnologías bioquímicas	55
Digestión anaeróbica	30
Fermentación de azúcares	27
Tecnologías químicas (transesterificación, Fischer-Tropsch, síntesis de metanol)	26
Nº TOTAL FAMILIAS DE PATENTES	**255**

Nota: Alguna invención puede incluirse en más de una tecnología

Tabla 2. Número de familias de patentes clasificados por tecnologías

En la Tabla 3 se muestran los países líderes en protección. En primer lugar se encuentran las solicitudes internacionales (PCT), con 91 documentos; en segundo lugar se encuentra EE.UU, con 60. En tercer lugar y a gran distancia, se encuentra la vía de protección europea (EP), con 28 documentos. En España, en el periodo analizado, se publicaron 5. En la Tabla 4 se recogen los ámbitos de protección más representativos de las invenciones correspondientes a las distintas tecnologías.

	País	Nº Documentos
1	PCT	91
2	EE.UU. (US)	60
3	EP	28
4	Alemania (DE)	24
5	Polonia (PL)	23
6	Brasil (BR)	21
7	Rusia (RU)	14
8	Francia (FR)	13
9	Reino Unido (GB)	7
	Japón (JP)	7
10	Canadá	6

Tabla 3. Ranking por países

Tipos de Tecnología (Nº Documentos)			
	Termoquímicas	Bioquímicas	Químicas
PCT	67	26	9
EP	22	3	3
Alemania (DE)	18	5	3
Brasil (BR)	7	7	8
Canadá (CA)	5	1	0
España (ES)	4	0	1
EE.UU. (US)	51	8	4
Francia (FR)	5	5	4
Indonesia (ID)	0	3	0
Polonia (PL)	17	5	1
Reino Unido (GB)	7	2	0
Rusia (RU)	12	1	1

Tabla 4. Ámbitos de protección más solicitados por tecnologías

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

TECNOLOGÍAS TERMOQUÍMICAS
Patentes

COMBUSTIÓN DIRECTA		
Nº Publicación	Solicitante (País)	Contenido técnico
DE102016014793	Brotzmann Karl Consulting (DE)	**Method for recovering the thermal energy from the exhaust gasses of wood and pellet furnaces.** The present invention relates to a method and a device for recovering the energy from the exhaust gases of wood and pellet furnaces and their use for preheating the combustion air with simultaneous deposition of particulate matter, by at least two means for receiving, storing and delivery of thermal energy, characterized in that a bed of a bulk material is traversed in a first step in a first flow direction of an exhaust gas from a boiler, thereby releasing sensible and latent heat to the bulk material, and In a second step in a reverse flow direction of the combustion air is flowed through, thereby receiving heat from the bulk material, wherein the ratio between the bed thickness b in the flow direction of the gas and the mean particle diameter d of the bulk material is at least 10 and the specific surface of the Bulk goods at least 200 m / mund maximum 2000 m / m, particularly advantageously at least 400 m / mbeträgt.
EP3306200	Bullerjan GmbH (DE)	**Convection stove.** Fireplace, at least comprising: a combustion chamber, comprising at least two compartments which are arranged one upon the other, and wherein the lower compartment and the upper compartment of said at least two compartments are separated by means of at least one baffle leaving at least one opening which connects/connect the lower compartment to the upper compartment; wherein said at least compartments are at least partially formed by air channels, which are opened at their lower and their upper ends, respectively, and wherein the inner surface of the combustion chamber formed by said air channels is corrugated; wherein the portion of the air channels forming said lower compartment of said combustion chamber is at least partially lined with a refractory material.
WO2018099496	Estate Reality Prague AS (CZ)	**Biological-origin waste material mixture for the production of a fuel intended for direct combustion and a method of fuel production from biological-origin waste materials.** Mixture of biological-origin waste materials, biodegradable, containing the biogenic elements, such as carbon, hydrogen, oxygen, sulphur and nitrogen, for the production of direct combustion fuel, located in an aerobic environment in the presence of air oxygen and other atmospheric gases. It contains starting humidity of 40-70% by weight of water and at least 25% by weight of organic substances, while the total weight of the mixture is at least 3,000 kg and is piled up to a height of max. 3 m to a vertical axial cross section shape in the form of an isosceles or equilateral triangle or trapezoid or rectangle. The mixture is composed of two basic groups of substances: for one thing, succulent substances having a water content of 5-98% by weight as a source of inoculum of microflora and water, and for another, non-succulent substances in a quantity of at least 15% of the total weight of the mixture as a source of reducing agents and structural substances. The succulent substances are meant at least one type of sludge-kind material that is composed of a liquid phase and a solid phase dispersed in the liquid phase. The non-succulent substances are materials containing cellulose with a fraction of 15-750 mm. The succulent substances are sludge from municipal wastewater treatment plants and/or sludge from industrial wastewater treatment plants and/or less sludgy materials. Non-succulent substances are lignocellulosic materials and/or packaging and their parts from commercial and/or communal areas and/or other materials containing cellulose. The method of fuel production from biological-origin waste materials, total composition of which is in accordance with the invention, where individual components are deposited into layers under normal atmospheric conditions to form the mixture, while the individual components are selected and/or added according to the humidity content, the initial humidity of the mixture being 40-70% of mixture weight, while the resulting looseness of the mixture allows for the independent keeping of the piled up shape. Subsequently, they are mechanically mixed into a homogeneous composition and uniform distribution of the humidity, and they are piled up as a mixture into a shape with a maximum height of 4 m, which drops down to the required height of 3 m after sinking. Then, surface desiccation of the mixture related to the mixture flings is observed, where the mixture is mixed mechanically and/or pneumatically and re-homogenized if the flings occur; at the same time, leakages from the lower mixture part are monitored. If any leakage occurs due to an excessive sinking or humidity permeation into the lower layer, the mixture is mechanically and/or pneumatically mixed and re-homogenized. At the same time, the temperature progress is monitored at least 0.8 m above the base and at least 0.8 m below the mixture surface, while the mixture is re-mixed in the case of premature temperature stagnation. The process ends when temperature fluctuations are stopped at a stable temperature of maximum 40 °C.

Nº Publicación	Solicitante (País)	Contenido técnico
DE202018102029	Fischertec GmbH (DE)	**Combustion furnace for burning e.g. pellets, has supply device supplying hot air to set of heat-resistant heat sensors, and discharge device for discharging heat absorbed from combustion chamber and/or for discharging hot air.** The furnace has a combustion chamber, a set of incombustible and/or heat-resistant heat sensors, and a supply device that is arranged for supplying hot air derived from the combustion chamber to the set of incombustible and/or heat-resistant heat sensors. A discharge device is arranged for discharging the heat absorbed from the combustion chamber and/or for discharging hot air. The heat is continuously supplied to the combustion chamber. A heat exchanger is provided for discharging the heat of the heat-resistant heat sensors.
WO2018098377	Higgins Daniel R et al. (US)	**Method and apparatus for the improved combustion of biomass fuels.** A cylindrical furnace having a vertical axis advantageously controls the combustion. Solid fuel, particulates, and gases are present inside the furnace and rotate around the axis of the cylinder to induce the solid particles and gases to stratify radially due to centrifugal force. Fuel and particulates at the perimeter slip in and out of suspension as they drag on the wall of the cylinder. This increases the residence time of the particles in the furnace. The solid particles are composed of combustible fuel particles, non-combustible ash, and non-combustible contaminants that enter with the fuel. It is necessary to control the temperature of the non-combustible particles and the wall surface to prevent non-combustible particles from adhering to and building up on the furnace wall. It is also advantageous to control the gas temperature leaving the furnace to minimize temperature driven corrosion of downstream heat exchanging surfaces. Method and apparatuses are described to control the gas, non-combustible particle, and wall temperatures within the cylindrical furnace. The furnace can be integrated into a stand-alone boiler or as a combustor in which a portion of the pyrolysis gas from the combusting fuel is burned in a separate vessel.
US2018142886	Huddleston Sky et al. (US)	**Highly Efficient Wood Stove/Heater.** A highly efficient indoor heating system and device is described. The device is equipped with an internal chimney, as well as vents that are configured to maximize the draft applied to the flame housed within a stove combustion area. The heater is configured to reach temperatures exceeding 300 degrees Fahrenheit in approximately ten minutes. A gravity fed fuel tube, potentially in communication with a wood pellet hopper, is configured to deliver fuel to the stove of the heater. Heat is distributed throughout the structure of the device, and a convection chamber within the device ensures that heat generated is not quickly lost via exhaust.
EP3324122	Klement Toni (DE)	**Fireplace.** A stove is proposed which comprises a combustion chamber with a combustion chamber wall and a combustion space, and a supply air distributor which is fed to the combustion space, the distribution facility comprises a manifold disposed on a bottom of the combustion chamber wall, the manifold having a plurality of openings opening into the combustion chamber and through which supply air directly into the combustion chamber is inflatable, and wherein the distributor is connected fluidly effective guide means for supply air having at least one opening through which at or in the vicinity of the combustion chamber wall spaced from the distributor supply air into the combustion chamber is inflatable.
WO2018096663	Mitsubishi Heavy Ind Environmental & Chemical Eng Co Ltd (JP) et al.	**Biomass raw material decomposition device, and method for producing biomass pellet fuel.** The present invention is provided with: a reactor that accommodates biomass raw material and heats and decomposes the biomass raw material using steam; an offgas duct through which offgas generated from the biomass raw material in the reactor flows; a steam generator that combusts the offgas from the offgas duct to generate the steam, and supplies the steam to the reactor; a supply valve that cuts off the reactor from outside air; an offgas valve that adjusts the flow rate of the offgas in the offgas duct; a discharge unit that discharges a treated biomass produced by heating and decomposing the biomass raw material within the reactor; a discharge valve that opens and closes the discharge unit; and a control device that controls the offgas valve, depressurizes the reactor at a depressurization speed at which no blasting occurs, and enables the offgas to be discharged to the offgas duct.

Nº Publicación	Solicitante (País)	Contenido técnico
PL418350	New Tech Trade Społka Z Ograniczoną Odpowiedzialnością (PL)	**Method and the device for carbonification of biomass material or the mixture of biomass material with hard coal and/or brown coal.** The subject of the invention is a method and a device for carbonizing a feed material in the form of a biomass material or a mixture of biomass material with hard and / or brown coal to obtain a solid product with a high degree of coalification. The method is based on the fact that the particulate feed material is introduced into the hopper of the sloping coalification reactor, from where it is taken to the inner chamber, where continuous mixing with at least two counter-rotating stirrers moves the incline in down along the chamber in which, without oxygen, at a temperature of 300 to 1200 °C is subjected to a process of carbonisation, with the release of gas products gravitationally pulled to the top of the chamber, where they are subjected to the combustion process as a result of mixing with zone air through air nozzlesmounted through the ceiling of the chamber, the air is drawn from the air boxes installed above the roof and introduced into the chamber at an angle (?) to the ceiling surface, contrary to the direction of movement of the charred material to be batched. The combustion gases generated in the combustion process are directed along the ceiling, after which they are sucked into the injector and then led to the environment, while the carbonized substrates after moving through the entire length of the chamber are in the form of charred products are led out through the outlet channel outside the coalification reactor. In case the initial material has a moisture content> 25%, it is subjected to preliminary drying in the dryer before it enters the coalification reactor.
DE202018100782	Olsberg GmbH (DE)	**Solid fuel heater for use as wood-burning stove for domestic use.** The heater has housing comprised of a combustion chamber which is accessed from outside by opening a door from a closed position to an open position. A door linkage is mechanically connected to the door to guide the opening and closing movement of the door. A drive unit comprises an electric motor that is connected to the door linkage. A control device is designed for controlling drive of the motor so as to be able to open and close the door by moving the door linkage.
EP3333487	Oviatt William T (US)	**Wood-burning appliance.** The disclosure relates to a wood-burning appliance. The wood-burning appliance comprises a firebox and an airflow apparatus configured to provide a supply of oxygen for efficient primary and secondary fuel combustion within the firebox. An oven may be positioned above the firebox to improve heat exchange from exhaust exiting the wood-burning appliance. The wood-burning appliance may further have a pulley system for operation of a door that reduces gasket wear and allows the door to be at least partially removed from the wood-burning appliance for ease of access and maintenance.
PL418460	Piwowarski Bartłomiej (PL)	**Device and method for biomass combustion.** The device and method of biomass burning, including agricultural biomass (agro) such as straw in chips (chips / chaff) and in the form of granules (pellets), is characterized by the fact that recirculated fumes are collected from the chimney through the exhaust fan with the recirculated flue gas duct and are fed into the combustion chamber through a recirculated flue gas collector. The above-mentioned device is characterized by exhaust recirculation, the possibility of burning biomass of agricultural origin, straw type, and simultaneous protection of the boiler's internal surfaces. Exhaust gas recirculation improves the work of boilers with retort burners as well as grate boilers or the like.
US2018094818	Prakti Pte Ltd (SG)	**Apparatus for combustion of solid fuels.** An apparatus and method for the combustion of solid fuel are provided. The apparatus includes a combustion chamber with a floor, a side opening, an airflow disk located above the side opening, and secondary air inlets located above the airflow disk. The apparatus and method can efficiently combust solid fuels with low emission of particulate matter and harmful gases, continuous feeding of fuel during combustion, and the production of a spiral flame.
US2018149366	Schneider James (US)	**Wood pellet combustion system.** A wood pellet combustion container for a fireplace. The wood pellet combustion container comprises a housing having a base and a sidewall forming an interior volume having an open upper end. The housing further includes a platform that is slidably disposed within the sidewall at the open upper end such that it can be removed from the housing. The platform includes a plurality of apertures and a handle disposed thereon, wherein the platform receives burning wood pellets. The sidewall further includes a drawer slidably mounted below the platform, wherein the drawer receives wood pellet ashes that fall through the plurality of apertures. The wood pellet combustion container is placed within a fireplace, such that heat is generated from burning wood pellets placed on the platform.

Nº Publicación	Solicitante (País)	Contenido técnico
WO2018083507	Tsopoulidis Makarios (GR)	**Stove-boiler.** The invention refers to a new type stove - boiler, operating without the use of electricity. The stove has a combustion tank with a combustion furnace and a storage tank for the pellets. The two tanks are connected to each other by means of a conduit so that the pellets are supplied by taking advantage of the communicating vessels phenomenon. Combustion of pellets is carried out with air supply through hot air inlet ports while secondary combustion is effected by means of air entering from the inlet ports to the exhaust gas passing through the pipe from the holes. The hot air is pushed to the environment from outlet ports adjusted by grilles.

PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
GB2557392	Amanda Jane Napier (AE)	**Apparatus and method for in-situ destruction of municipal solid waste material.** Municipal solid waste (MSW) is introduced into a primary module to produce a waste feedstock which is gasified in a secondary module comprising a primary plasma gasifier. A generator module generates electricity from synthesis gas produced from the primary gasifier. The primary module, secondary module, and generator module are contained in a compact housing suitable for locating in a private dwelling or small commercial premises. Exhaust gas from the secondary module is routed through a ducting assembly comprising a feedback loop to the primary gasifier, and/or a conduit to a secondary plasma gasifier. Primary residual gas is recirculated back to the primary gasifier, and/or to a secondary plasma gasifier, to produce a secondary residual gas. Secondary residual gas produced from the primary or secondary gasifier is vented through a vent. A shredder may produce a shredded waste feedstock, and a filter module may remove solid or gaseous residue from the secondary residual gas before venting.
US2018134899	Carbon Res & Development Co (US)	**Renewable pyrolysis-gas derived carbon black material and method of making the same.** A method for the production of a carbon black entirely from raw biomass feedstock by pyrolytically decomposing the biomass feedstock in a controlled processing atmosphere at a preselected temperature for a preselected period of time to produce solid carbon material and wood gas, and using the wood gas as a fuel to pyrolyze added oils in a carbon black furnace to produce carbon black and gaseous by-products for processing the biomass feedstock. The carbon material has a carbon content of greater than 90% by volume of non-volatile, high purity fixed elemental carbon, is free of environmentally hazardous chemical compounds and components surface area, and includes specific properties, such as density, hardness, or chemical composition to provide superior properties in diverse applications.
WO2018096056	Commissariat a l´Energie Atomique et aux Energies Alternatives (FR)	**Method for processing a biomass powder by wet granulation with a view to introducing same into a reactor, associated biomass powder, application to biomass gasification.** The present invention concerns a biomass gasification method, comprising the following sequence of steps: a/ drying a biomass; b/ grinding the biomass in order to obtain a dry powder, c/ wet granulation of the biomass powder in order to obtain biomass granules in the form of a meal; d/ drying the meal granules; e/ injecting the dry meal into a gasification reactor.
RU2649446	Doroshchuk Nikolaj Anatolevich (RU)	**Method and device for processing carbon-containing waste.** Invention relates to carbonaceous solid substances processing into alternative energy resources used for both industrial and domestic needs. At the first stage, at least in two retorts, carbon-containing waste is heated without access to air to a temperature of 600-800 °C until pyrolysis gas and a solid carbonaceous residue are obtained, followed by the utilization of pyrolysis gas in the firebox, and at the second stage, the solid carbonaceous residue is further heated in the presence of water vapor to a temperature of 800-1,000 °C until a water gas is obtained, followed by its utilization in the same firebox. Device for processing carbonaceous waste contains furnace 2 with firebox 1 and chimney 3. There are at least two successively connected sections in the furnace, each of which is arranged to remove the retort, the retorts are provided with water vapor supply manifolds for the pyrolysis activation of the solid carbonaceous residue with water gas formed in the retorts and the manifolds for removing the pyrolysis gas and water gas for utilization in firebox 1, with the retorts communicating with each other.EFFECT: technical result obtained in the implementation of the developed method and device consists in the development of a non-waste processing process for solid carbonaceous wastes, including infected animal dead bodies and medical wastes; the resulting emissions into the atmosphere are not soot or harmful impurities, but the vapor-gas mixture consisting of 95 % of water and 5 % of carbon oxides and nitrogen oxides.6 cl, 1 dwg

Nº Publicación	Solicitante (País)	Contenido técnico
US2018119020	Enginuity Worldwide Llc (US)	**System for producing biocoal and biochar using a rotary compression unit.** A system for producing biocoal and biochar includes at least one rotary compression unit (RCU) having a barrel, a compression screw housed within the barrel, a feed for receiving biomass and at least one exit for releasing biochar and gasses formed in the RCU. A first exit stream is produced that includes biochar and a portion of the remaining gasses, and a second exit stream is produced that includes biocoal. A gas crossover is provided that connects the first and second exit stream having a mechanism for transporting gasses from the first exit stream to the second exit stream thereby condensing a portion of the remaining gasses into the biocoal. In one form two RCUs are included connected to two condensers.
US2018118644	Iowa State Univ Research Foundation Inc (US)	**Fast pyrolysis of biomass in an autothermally operating reactor.** The present invention is directed to a pyrolysis method. The method involves providing a biomass and subjecting the biomass, in a reactor operating under conditions of parasitic heat loss of less than 1% of the biomass' chemical energy content, to partial oxidation where, during steady state operation of the reactor, oxygen is provided to the reactor in sufficient quantity to achieve an equivalence ratio of 0.06 to 0.15 to release sufficient energy to support endothermic pyrolysis reactions and produce condensable organic compounds as the major portion of the pyrolysis products.
GB2556665	Linde AG (DE)	**Methods for hydrogen production.** A method for producing hydrogen from biomass comprising feeding the biomass to a gasifier A, feeding the gasification products to a water gas shift reactor D, feeding the water gas shift reaction products to an electrochemical separation and compression device (ESCD) and recovering the hydrogen. Preferably the biomass is dried before being fed to the gasifier. Biomass typically includes virgin wood, energy crops, agricultural residues, food waste and industrial waste. Ideally the drying is provided by heat from the electrochemical separation and compression device. The gasification products may be cooled B before being fed to the water gas shift reactor. The gasifier is ideally an atmospheric pressure gasifier. Preferably a catalyst is present in the water gas shift reactor. Ideally the ESCD separates hydrogen from the water gas shift reaction products at a pressure of 7-14 bar (0.7MPa-1.4MPa). The hydrogen produced from the ESCD is at a pressure of 150-350 bar (15MPa-35MPa). An apparatus for producing hydrogen from biomass comprising a gasifier in fluid communication with a water gas shift reactor in fluid communication with an ESCD is also claimed. The hydrogen produced by the method above can be used in a fuel cell device for power production.
WO2018073845	Now Ingenierie Francaise (FR)	**System and process for the pyrolysation and gasification of organic substances.** A system is described for pyrolysing and gasifying organic substances comprising at least one evaporation module for drying biomass, at least one pyrolysis module for producing syngas pyrolysis fuel gas and organic residue substances, at least one gasifier for producing gasification syngas fuel gas, and at least first and second channeling means, such first channeling means being adapted to drive at least one first flow of fuel gas from at least one of such pyrolysis modules towards at least one of such gasifiers and such second channeling means being adapted to drive at least one second flow of fuel gas from at least one of such pyrolysis modules towards at least one external energy user. A process for the pyrolysation and gasification of organic substances is further described.
WO2018089520	Phillips 66 Co (US)	**Fluidized upgrading/hydrostabilizing of pyrolysis vapors.** The present disclosure relates to processes and systems that convert biomass to stable intermediate hydrocarbon products that having a greatly decreased oxygen content. This stabilized intermediate hydrocarbon product may be easily be stored for an extended period of time, further refined into liquid transportation fuels (either alone or mixed with petroleum- derived hydrocarbons), or blended with petroleum-derived blendstocks to produce a finished liquid transportation fuel.

Nº Publicación	Solicitante (País)	Contenido técnico
WO2018066013	Processi Innovativi SRL (IT)	**Method and equipment to produce a syngas from wastes, preferably industrial or municipal wastes and their deliverables.** The invention concerns a method to produce a syngas from wastes, preferably municipal wastes or derived fuel from wastes, wherein: - wastes are fed into a reactor at a temperature between 20 and 800°C to form a fixed bed; - oxygen is injected at the bottom of said fixed bed to react with said wastes in an oxidation reaction to give a syngas, the temperature of the bottom of said fixed bed being maintained in a range between 1400 and 2000°C, preferably between 1400 and 1600°C, to form a melting area at the bottom of said fixed bed, where melting of inert and metal compounds contained in said wastes is obtained; - said syngas flows through said fixed bed, causing an endothermic cracking reaction and a progressive lowering of the temperature, to form a gasification area, until reaching a temperature of around 800°C at the top of said fixed bed; - oxygen is injected inside said reactor, above said fixed bed, causing oxidation and increasing the temperature up to 1200°C, to form a post-reheating area; - a stabilizing area is provided at the top of said reactor, where the temperature ranges from 1050 to 1200°C; and wherein - the temperature profile at the bottom and along the height of said reactor is controlled by injection of an inert gas flow at the bottom of said fixed bed, together with oxygen.
WO2018083554	Reset SRL (IT)	**Woody biomass cogeneration plant for the continuous production of heat and electricity.** Cogeneration plant for the continuous production of electrical and thermal energy from solid woody biomass, the latter being selected from among wood in the form of woodchips, vine branches, shrubs and underbrush, grain, hay, animal litter, suitably-treated muds, shells and kernels, suitably-treated husks, fibrous cultures and compositions thereof, said plant comprising at least one first container and at least one second container connected by at least one interconnection duct, said first container comprising the components suitable for inducing the transformation of said biomass into syngas comprising H2 and CO; said plant providing for a particular step of screening, drying and briquette-making on board the machine of the solid woody starting biomass.
US2018127671	River Basin Energy Inc (US)	**Method of drying biomass.** A process for torrefaction of biomass is provided in which biomass are passed into a fluidized bed reactor and heated to a predetermined temperature in an oxidizing environment. The dried biomass is then fed to a cooler where the temperature of the product is reduced to approximately 100 degrees Fahrenheit.
ES2660713	Univ Cadiz (ES)	**Apparatus for the integrated oxidation and gasification of aqueous organic waste in supercritical water.** Apparatus for the integrated oxidation and supercritical gasification of aqueous organic waste. The invention pertains to the technical field of the treatment of organic waste and to the field of energy recovery from waste with a high concentration of organic material by oxidation and supercritical water gasification. The invention allows aqueous waste with a high concentration of organic material to be purified in an oxidation reactor, and part of the heat generated by strongly exothermic reactions is transferred through the wall of the reactor to an outer casing in which another aqueous stream of organic waste under high-pressure is circulated and heated until endothermic gasification reactions are produced to generate fuel gases (mainly hydrogen). The reactor and the casing thereof form a device similar to a heat exchanger with concentric tubes in which the heating fluid is separate from the cooling fluid.
WO2018076093	Univ Western Ontario (CA)	**Hydrothermal liquefaction co-processing of wastewater sludge and lignocellulosic biomass for co-production of bio-gas and bio-oils.** This disclosure provides a process based on hydrothermal liquefaction (HTL) treatment for co-processing of high-water-content wastewater sludge and other lignocellulosic biomass for co-production of biogas and bio-crude oil. The mixture of waste activated sludge and lignocellulosic biomass such as birchwood sawdust / cornstalk / MSW was converted under HTL conditions in presence of KOH as the homogeneous catalyst. The operating conditions including reaction temperature, reaction time and solids concentration were optimized based on the response surface methodology for the maximum bio- crude oil production. The highest bio-crude oil yield of around 34 wt% was obtained by co-feeding waste activated sludge with lignocellulosic biomass at an optimum temperature of 310°C, reaction time of 10 min, and solids concentration of 10 wt%. The two by-products from this process (bio-char and water-soluble products) can be used to produce energy as well. Water-soluble products were used to produce biogas through Bio-methane Potential Test (BMP) and were found to produce around 800 mL bio-methane cumulatively in 30 days per 0.816 g of total organic carbon (TOC) or 2.09 g of chemical oxygen demand (COD) of water-soluble products.

Nº Publicación	Solicitante (País)	Contenido técnico
EP3309240	WS Waermeprozesstechnik GmbH (DE)	**Method and device for gasification of biomass.** The invention relates to a process for gasification of biomass and an apparatus adapted therefor. The process is effected in at least three process steps. In a first process step in one working example biogenic residue (biomass) may be supplied to a heating zone to dry the biomass and allow the volatile constituents to escape in order to generate a pyrolysis gas therefrom. The pyrolysis gas is supplied to an oxidation zone and substoichiometrically oxidized there to generate a crude gas. The coke-like, carbonaceous residue generated in the heating zone is together with the crude gas partially gasified in a second process step in a gasification zone. The heating zone may be heated indirectly. The gasification zone may likewise be heated indirectly. The heating zone and the oxidation zone are preferably zones that are separate from one another in separate chambers. The gasification forms activated carbon and a hot process gas. The process according to the invention comprises/the apparatus is adapted for cooling a certain amount of the activated carbon of not less than 0.02 kg to not more than 0.1 kg per kilogram of supplied biomass (water- and ash-free, waf) from which the activated carbon is formed in the gasification zone and also the hot product gas in a third process step in a cooling zone, for example to not more than 50°C. It is preferable when the apparatus is adapted such that/the process comprises conjointly cooling the activated carbon and the hot process gas such that the temperature of the process gas in the cooling zone during conjoint cooling with the activated carbon remains above a lower threshold temperature which is higher than the dew point temperature of the product gas. The adsorption process taking place during the conjoined cooling of activated carbon and product gas has the result that during the cooling tar from the hot process gas is absorbed on the activated carbon in the cooling zone. As a result after the third process step a pure gas which is substantially tar-free is obtained. The tar-enriched activated carbon may be at least partly burned for heating the heating zone and/or the gasification zone.

TECNOLOGÍAS BIOQUÍMICAS
Patentes

DIGESTIÓN ANAERÓBICA		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2018095579	Avocet Infinite PLC (GB)	**Apparatus and method for producing methanol.** An apparatus (10) is provided for producing methanol from organic material, characterized in that the apparatus (10) includes: • (i) an anaerobic digestion arrangement (20) for receiving the organic material and for anaerobically-digesting the organic material in oxygen-depleted conditions to generate methane gas; and • (ii) a chemical reaction arrangement (30) for reacting the methane gas with water vapour and carbon dioxide in a stoichiometric condition (Eq. 4) between methane steam reforming and methane dry reforming to generate methanol. The apparatus (10) is operable to support a stoichiometric reaction as follows: CO2 + 3CH4 + 2H2O = 4CH3OH Eq. 4 - The chemical reaction arrangement (20) is operable to provide the stoichiometric condition (Eq. 4): • (i) at a first stage for steam reforming at a pressure in a range of 10 Bar to 30 Bar, and at a temperature in a range of 750 °C to 950 °C; and • (ii) at a second stage of methanol synthesis at a pressure in a range of 50 Bar to 100 Bar, and at a temperature in a range of 200 °C to 250 °C. Optionally, a catalyst arrangement is employed for at least the second stage.
WO2018064993	Archea New Energy GmbH (DE)	**Multi-chamber system for generating biogas.** The invention relates to a multi-chamber system (1) for generating biogas from a fermentable substrate. By virtue of the special design of the multi-chamber system, which comprises at least two chambers, preferably three chambers (2, 3, 4), a method for generating biogas is provided, said method ensuring a continuous generation of gas in the event of a discontinuous supply of putrescible biomass. In the method for generating biogas in the multi-chamber system (1), a fermentation container (3) is provided in particular which takes multiple aspects into consideration while efficiently generating biogas, in particular the aspect of buffering the putrescible substrate in the event of an irregular supply of the required biomass. Additionally, the structure of the entire multi-chamber system (1) is designed such that the system can be erected compactly in a modular manner.
WO2018088884	Centro Investig y Asistencia en Tecnología y Diseño Estado de Jalisco AC (MX)	**Method for obtaining a microbial consortium in order to produce hydrogen and hydrolysates using complex substrates.** The present invention relates to a method for obtaining a stable and robust microbial consortium or inoculum, which produces hydrogen and hydrolysates for the generation of methane as an energy source in biological production systems using complex substrates, specifically agroindustrial waste, industrial wastewater, urban solid organic waste and lignocellulosic materials. The method of the invention ensures the production of an inoculum having a microbial structure with the following advantages: reproducible on a large scale; highly robust, predominance over the microflora native to the substrates; high hydrolytic capacity; generates natural anaerobic conditions, without requiring the injection of an inert gas or the addition of a chemical reducing agent; highly stable, viable for up to 2 years when refrigerated; and reactivation time measured in hours.
FR3059336	France Evaporation (FR)	**Methanisation of biomass and the treatment of the digestates of the methanation by concentration.** The present invention relates to a process for the methanization of biomass and the treatment of the digestates of the methanation by concentration, said method being implemented in a unit having a methanisation plant comprising a methanation reactor, hereinafter referred to as a methanizer (M) , and an evaporative digestate concentration plant, hereinafter referred to as an evaporator (Ev), said method comprising the following steps: a step a) for which the methanizer (M) is fed with a biomass and is implemented fermentation reaction of the biomass in the methanizer, obtaining a biogas - a step b) for which the exhausted biomass of the methanizer (M), hereinafter referred to as digests, is discharged, a step c) for which a liquid fraction of digestates in the evaporator, obtaining concentrated liquid digestates, and in which one brings to the biomass contained in the metha inventing a thermal input (Api) for the needs of the fermentation in the methanizer (M). According to the invention, the lost heat contained in gases (G) at the outlet of the evaporator (Ev) is recovered at least in part. for heating a heat transfer liquid (Lc) of a heating loop, and the heat transfer liquid is used to cover all or part of the thermal input of the methanizer, by exchange between the heat transfer liquid (Lc) and the biomass contained in the methanizer (M).

Nº Publicación	Solicitante (País)	Contenido técnico
RU2651940	Golubenko Mikhail Ivanovich (RU)	**Biogas plant for the reduction of organic waste from agricultural production accompanied with the biogas obtaining.** FIELD: technological processes; gas industry. SUBSTANCE: invention relates to production of biogas. Biogas plant for fermenting the organic waste from agricultural production accompanied with biogas production is proposed. Plant includes the sealed vertical cylindrical tank with the nozzles for feeding biomass, for draining the recycled substrate and for extracting the biogas. Bubbling mixer is installed in the barrel in the form of a single vertical pipe. Moreover, the vertical pipe is installed in the center of the tank and has openings on top and bottom for connection of radial branches providing circular rotation of the biomass in the form of curved horizontal tubes with the nozzles. Submerged U-shaped horizontal shelf in the form of a ring is installed on the upper part of the tank dome with the possibility to adjust the height of the displacement relative to the level of biomass. EFFECT: invention allows to increase the efficiency of complete mixing of biomass for fermentation.
PL419131	Inst Chemii I Techniki Jadrowej (PL)	**Method for sewage sludge hygienization.** The subject of the application is the method of hygienization of sewage sludge in liquid or solid form. The method consists in the fact that the biomass waste before fermentation or the digestate obtained in the biomass methane fermentation process is irradiated with an electron beam from the accelerator with energy from 1 MeV to 10 MeV, preferably from 1 to 3 MeV.
WO2018065673	Metener Oy (FI)	**Method and arrangement for producing biogas.** The invention relates to a method and an arrangement for biogas production. The idea is to use the upper section of recovered percolation fluid for moistening the biomass and return the percolation fluid deliberated from the biomass to the bottom section of the fluid reactor.
US2018086654	Univ Lehigh (US)	**In-situ, self-adjusting stability control of methane-producing anaerobic biological reactors through novel use of ion exchange fibers.** An anaerobic biological reactor comprising an anaerobic digester having a chamber configured to receive a microbial suspension, a chamber inlet configured to direct an organic waste stream into the digester, and ion-exchange fibers within the chamber in position to contact and chemically react with microbial suspension received into the chamber. A method for treating organic waste with a methane-producing anaerobic biological reactor comprise providing a methane-producing anaerobic biological reactor comprising an anaerobic digester containing a microbial suspension comprising acetogenic bacteria, methanogenic bacteria and a plurality of ion exchange fibers, introducing organic waste into the anaerobic digester, maintaining the microbial suspension in contact with the organic waste and at least a portion of the plurality of ion-exchange fibers for a period of time and under conditions sufficient to treat the organic waste and produce methane, and removing the treated organic waste and methane from the anaerobic digester.
WO2018076093	Univ Western Ontario (US)	**Hydrothermal liquefaction co-processing of wastewater sludge and lignocellulosic biomass for co-production of bio-gas and bio-oils.** This disclosure provides a process based on hydrothermal liquefaction (HTL) treatment for co-processing of high-water-content wastewater sludge and other lignocellulosic biomass for co-production of biogas and bio-crude oil. The mixture of waste activated sludge and lignocellulosic biomass such as birchwood sawdust / cornstalk / MSW was converted under HTL conditions in presence of KOH as the homogeneous catalyst. The operating conditions including reaction temperature, reaction time and solids concentration were optimized based on the response surface methodology for the maximum bio- crude oil production. The highest bio-crude oil yield of around 34 wt% was obtained by co-feeding waste activated sludge with lignocellulosic biomass at an optimum temperature of 310°C, reaction time of 10 min, and solids concentration of 10 wt%. The two by-products from this process (bio-char and water-soluble products) can be used to produce energy as well. Water-soluble products were used to produce biogas through Bio-methane Potential Test (BMP) and were found to produce around 800 mL bio-methane cumulatively in 30 days per 0.816 g of total organic carbon (TOC) or 2.09 g of chemical oxygen demand (COD) of water-soluble products.

Nº Publicación	Solicitante (País)	Contenido técnico
EP3333250	Vilniaus Gedimino Technikos Univ (LT)	**Bioreactor and biogas production method.** The bioreactor of the present invention characterizes by having an additional aerobic-anaerobic camera (9) for biomass treatment arranged between the primary biomass preparation camera (1) and the main anaerobic camera (15). The camera (9) is used for preparing biomass for further anaerobic digestion in the main anaerobic camera (15). The deoxidation process takes place therein, the biomass is mixed with a modified mechanical mixer (13) consisting of a surface mixer (13A), a mixer with vertical blades (13B), and spiral mixer (13C), and heated by four heating elements (12) to a temperature of 30-35°C suitable to mesophilic process. The main anaerobic camera (15) produces biogas. The camera (15) has four biomass heating elements (18) and a modified mechanical mixer (19) consisting of a surface mixer (19A), a mixer with vertical blades (19B), and a spiral mixer (19C). All mixers are arranged on a single shaft (4). The gravity movement of biomass from the camera (9) to the camera (15) is controlled by automatic valves (7B) and (7D) controlled by an automatic control unit (24) depending on signals of pressure sensors (11G) and (11K). Produced biogas is stored in a gasholder (23).
WO2018091600	Yannco (FR)	**System and process for producing biogas from solid biomass.** The present invention relates to a system for producing biogas comprising at least one central unit for storing liquid digestate and for additional digestion (25), at least one central unit for storing biogas (25), a plurality of anaerobic digesters (100, 101, 102, 103), a network (33) for supplying liquid digestate (27), a network (35) for discharging liquid digestate (27) and a network (34) for discharging biogas (29); at least one of said anaerobic digesters being removable (100, 101, 102, 103) and able to be connected to and disconnected from said networks (33, 34, 35). The invention also relates to a process for producing biogas and also to a removable solid biomass anaerobic digester (100, 101, 102, 103).

FERMENTACIÓN DE AZÚCARES

Nº Publicación	Solicitante (País)	Contenido técnico
MX2016009575	Centro Investig y Asistencia en Tecnología y Diseño Estado de Jalisco AC (MX)	**Process for obtaining lipids, proteins and organic acids from agroindustrial waste using Lipolytic Yarrowia.** The present invention aims to provide an integrated process for the production of unicellular protein as unicellular oils, which are lipids containing mainly triglycerides. Additionally to co-production of organic acids with oleaginous yeasts, using as waste sources different industrial process residues. The said residues such as the residual glycerol for the biodiesel process and the biodiesel process with chemical or enzymatic catalysts, vinasse alcohol or distilled alcoholic beverages, enzymatic hydrolysates of hemi-cellulosic or lignocellulosic bagasse and combinations of these residues. The said process is achieved with the low-cost of the additional nutrients for the culture means and microbial origin products, thereby producing them with renewable, non-contaminant and inexpensive sources.
WO2018091836	Centre Nat Rech Scient et al. (FR)	**Alpha-1,3-(3,6-anhydro)-D-galactosidases and the use of same for hydrolysing polysaccharides.** The present invention concerns the isolation, purification and characterisation of a protein having a novel enzymatic activity, i.e. an alpha-1,3-(3,6-anhydro)-D-galactosidase activity. This protein can be used for hydrolysing polysaccharides and oligosaccharides containing (non-sulfated) beta-carrabiose units, which may be present naturally (e.g. carrageenans extracted from red seaweeds of the Tichocarpus and Furcellaria genus) or introduced artificially by chemical or enzymatic desulfation (for example from kappa- and iota-carrageenans). The activity of this protein, demonstrated on oligo-carrageenans with a hybrid kappa/beta structure, makes it possible, for example, to produce the 3,6-anhydro-D-galactose monosaccharide and odd-numbered oligo-carrageenans of a defined size of the carrabiose series, i.e. having a D-galactose residue at the non-reducing end.

Nº Publicación	Solicitante (País)	Contenido técnico
PL417998	Kapela Tomasz Biotechnika (PL)	**Method for producing bioethanol with increased biological renewability coefficient.** The subject of the application is the method of production of bioethanol with an increased bio-renewable ratio, characterized in that the cereal raw materials are ground, after which the starch contained in the raw materials is subjected to enzymatic hydrolysis with the addition of enzyme preparation to obtain the form of fermenting sugars, then the resulting sugars are fermented to obtaining the first generation ethanol by the yeast of the species Saccharomyces cerevisae. Then the raw material is subjected to the distillation process, in which the ethanol produced from the post-process mixture was formed by distillation. Next, the process of separating the slurry from the liquid exhausted after distillation (decoction) is carried out to extract the solid fraction and separate the liquid fraction. Then the separated solid fraction is dried to form a solid semi-finished product, hydrolysed to the form of simple sugars by pressure and thermal method, then hydrolysed by a biological method, and simple sugars formed after hydrolysis are subjected to the fermentation process, followed by the distillation of ethanol II. The process of mixing the stream in proportions of ethanol of the first generation of 95 to 97%, second generation ethanol of 3 to 5%, which are then subjected to the dewatering process using the molecular sieve method.
WO2018070478	Nissan Chemical Ind Ltd (JP)	**Saccharification reaction liquid, saccharification enzyme composition, production method for sugar, and production method for ethanol.** A saccharification reaction liquid for saccharification of cellulose and/or hemicellulose, the reaction liquid comprising cellulose and/or hemicellulose, a saccharification enzyme, silica or a silica-containing substance, and at least one compound (A) selected from the group consisting of polyhydric alcohol compounds represented by general formula (1) and derivatives thereof, and acetylene glycols represented by general formula (2) and alkylene oxide adducts thereof. The symbols in the chemical formulas are as defined in the description.
WO2018060498	Norwegian Univ of Life Sciences (NO) et al.	**Process for degrading a polysaccharide employing a lytic polysaccharide monooxygenase.** The present invention relates to a method of enzymatically degrading a polysaccharide, such as cellulose, comprising contacting the polysaccharide with one or more lytic polysaccharide monooxygenase (LPMO), in which the enzymatic degradation is carried out in the presence of at least one reducing agent, and hydrogen peroxide or a means which generates hydrogen peroxide in which the level of hydrogen peroxide is controlled to enhance and maintain the activity of the LPMO. The invention also extends to the additional use of hydrolytic enzymes such as hydrolases (e.g. cellulases, chitinases and/or ß-glucosidases) to increase the level or extent of degradation and to fermentation of the resulting sugars to generate an organic substance such as an alcohol, preferably ethanol, which may be used as a biofuel.
WO2018085370	Novozymes AS (DK)	**Processes for reducing production of primeverose during enzymatic saccharification of lignocellulosic material.** The present invention relates to processes for increasing the yield of fermentable sugars during saccharification of a lignocellulosic material by reducing the amount of primeverose produced.
US2018163192	Novozymes Inc (US)	**Polypeptides having cellulolytic enhancing activity and polynucleotides encoding same.** The present invention relates to isolated polypeptides having cellulolytic enhancing activity and isolated polynucleotides encoding the polypeptides. The invention also relates to nucleic acid constructs, vectors, and host cells comprising the polynucleotides as well as methods of producing and using the polypeptides.
DE102017125090	PTT Global Chemical Public Co Ltd (TH)	**Pretreatment of lignocellulosic biomass in production of e.g. fuel.** This invention relates to a pretreatment process for lignocellulosic biomass technology which provides a high sugar content by enzymatic digestion of the lignocellulosic biomass after pretreatment, the process comprising the steps of: contacting a lignocellulosic biomass with an alkaline solution at ambient temperature; from step (a) obtained mixture with steam at a temperature of 160 to 210 ° C in a reactor under pressure of 5 to 20 bar for 30 seconds to 10 minutes; andreducing the pressure and the temperature in step (b) to the predetermined pressure and temperature to explode the lignocellulosic biomass, characterized in that the temperature in step (c) is in a range of -10 to 20 ° C is and the temperature reduction rate in step (c) is 5 ° C / min or more.

Nº Publicación	Solicitante (País)	Contenido técnico
BR102016018606	Univ Federal de Alagoas (BR)	**Obtaining second generation ethanol and its derivatives for biofuel industry.** The present invention aims to increase the productivity of ethanol from lignocellulosic residues of manihot esculenta through the incorporation of the stem of this plant, through enzymatic saccharification and fermentation, directly benefiting the gain biotechnology of the product. the economic viability is characterized by producing, besides second generation ethanol, chemical inputs with various industrial applications that can be used to obtain products with higher added value. the process of ethanol production from the manihot esculenta stem will complement the energy yield obtained from the peels of this plant. the steps up to the production of 2g ethanol are: chemical characterization, hygienization with hypochlorite solution 100 ppm, oven drying at 55 ° C and grinding in an industrial blender to obtain the manihot esculenta stem flour, pretreatment with dilute sulfuric acid in the concentration of 1,5%, enzymatic hydrolysis with the enzymatic complex cellic® ctec2 (novozymes), alcoholic fermentation with yeasts saccharomyces cerevisiae, finalizing with the determination of the alcoholic content by high performance liquid chromatography. the volume of 2g ethanol produced in this invention was 5.57 g / l.
US2018155744	Univ Stellenbosch (ZA)	**Recombinant yeast and use thereof.** A recombinant yeast that expresses both an α-amylase (SEQ ID NO: 1) and a glucoamylase (SEQ ID NO: 2) from Talaromyces emersonii (recently re-named as Rasamsonia emersonii) is provided. The use of the recombinant yeast in a process for producing an alcohol, in particular a biofuel, from starch or sugars is also described.
US2018073033	Wisconsin Alumni Res Found (US)	**Genes that improve tolerance to lignocellulosic toxins when overexpressed in yeast and methods of use in biofuel production.** The present invention provides isolated gene sequences useful in increasing lignocellulosic toxin tolerance in yeast. Such engineered yeast are useful in methods of biofuel production, particularly ethanol production. Methods of bioengineering recombinant yeast with increased lignocellulosic toxin tolerance are also provided.

TECNOLOGÍAS QUÍMICAS
Patentes

Nº Publicación	Solicitante (País)	Contenido técnico
FR3059327	Arkema France (FR)	**Acid composition for the treatment of fatty acids.** The invention relates to a composition comprising: at least one alkanesulfonic acid of formula R-SO3H, in which R is a linear or branched saturated hydrocarbon chain of 1 to 4 carbon atoms, optionally substituted with at least one halogen atom; sulfuric acid; and, optionally, at least one solvent; the proportions thereof being as defined in the description. The invention also relates to the use of the composition as a catalyst for esterifying fatty acids.
RU2650119	Federalnoe Gosudarstvennoe Byudzhetnoe Obrazovatelnoe Uchrezhdenie Vysshego Obrazovaniya Sankt Peter (RU)	**Composition of environmentally friendly diesel fuel (EFDF).** Invention discloses a composition of environmentally friendly diesel fuel (EFDF), comprising an initial diesel fuel and an ester additive, while the base diesel fuel is hydrotreated diesel fuel, and as an ester additive, products of esterification of fatty acids of vegetable oil with dihydric alcohol - ethylene glycol, with the following ratio: hydrotreated diesel fuel 90-99; ether additive 1-10.EFFECT: technical result is to improve the lubricity of the (EFDF), which in turn increases the life of the diesel engine, prevents premature wear of fuel equipment parts, as well as in the reduction of toxic exhausts with exhaust gases.1 cl, 2 tbl, 3 ex
WO2018098097	Khalifa Univ of Science and Technology et al. (AE)	**Continuous sono-chemical reactors and methods of using the same.** The present invention generally relates to reactors and methods of using the reactors and, more particularly, to continuous sono-chemical reactors and methods of producing biodiesel using the continuous sono-chemical reactors. The sono-chemical reactors may include a plurality of sections that are sequentially connected along a longitudinal direction of the sono-chemical reactor. The plurality of sections may include a sono-reactor section that includes a reactant inlet through which reactants are supplied into the sono-reactor section and a static mixer section that is configured to receive a first reactant/product mixture from the sono-reactor section and is configured mix the first reactant/product mixture therein for reaction between unreacted reactants. An inner space of the sono-reactor section may taper along the longitudinal direction of the sono-chemical reactor away from the reactant inlet. The plurality of sections may also include a product separation section that is configured to receive a second reactant/product mixture from the static mixer section and is configured to separate a product from the second reactant/product mixture.
WO2018083576	Nayak Swarup Kumar et al. (IN)	**Method of preparation of biodiesel and apparatus therefor.** A method and an apparatus to produce biodiesel with high yield and purity is disclosed. The apparatus employing the method includes a methanol reactor tank to mix an acidic catalyst with methanol for carrying out processes subsequent. The mixture is transferred to an acid reactor tank in which vegetable oil is introduced and esterification carried out. The esterified oil is next transferred to a base reactor tank that receives methanol and a basic catalyst from the methanol reactor tank. Transesterification /neutralization of the esterified oil is carried out therein to produce biodiesel that is further purified using dry washing. Glycerine produced in acid reactor tank and base reactor tank is allowed to settle and decanted, while methanol in both the tanks is recovered using heat exchangers and recycled. Fluid transfer from one tank to another is achieved using gravity. The apparatus is mounted on a portable trolley and so is capable of quickly being relocated as needed.
EP3305877	Petroleo Brasileiro SA (BR)	**Process for purifying biodiesel.** The present invention describes a process for purifying biodiesel without using a filter aid, in which purification of the biodiesel takes place by a sequence of washing operations after the reaction section, with stirring that is sufficiently vigorous to assist in the transformation of the molecules of esterified steryl glycosides, in order to convert them to a chemical form that can be removed by the process.

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PL420953	Politechnika Wroclawska (PL)	**Proecological fuel biocomponent from waste materials for compression-ignition engines and method for obtaining proecological fuel biocomponent and application of the proecological fuel biocomponent.** The subject of the application is a pro-ecological biocomponent of fuel from waste materials to produce biofuel for self-ignition engines, which is a mixture of ethyl and / or methyl esters produced by ethanol esterification or methanol mixture of waste materials consisting of 10% m / m to 90% m / m of pork fat waste - preferably 22% m / m, from 10% m / m to 90% m / m fat poultry fat - preferably 10% m / m, from 10% m / m to 90% m / m waste frying fats - preferably 65.5% m / m and unimplemented plant components in an amount of 1% m / m to 50% m / m, especially rapeseed oil - preferably in an amount of 2.5% m / m. The application also includes a method for producing a biocompatible fuel biocomponent, which is characterized in that the non-ethanol glyceride collection process proceeds, through cyclic heat supply and pressure change, in temperature ranges of preferably from 343 to 348 K for ethanol and preferably in temperature ranges from 333 to 338 K for methanol. The subject of the application is also the use of an environmentally friendly fuel biocomponent, which consists in the fact that it is a component of a biofuel intended for self-ignition engines as well as a substitute for fuel oil for thermal equipment.
WO2018099888	Siemens AG (DE)	**Use of glycerine produced in particular during the production of bio-diesel.** The invention relates to the use of glycerine produced in particular during the production of bio-diesel in a bio-diesel refinery, as an energy storage material for storing heat and/or for providing electricity.
BR102016008627	Univ Federal do Espirito Santo (BR)	**Preparing ethyl esters (biodiesel) from fry oil wastes involves using lithium hydroxide basic catalyst mixture, and associating anhydrous lithium hydroxide (LiOH) with hydroxide of sodium or with potassium hydroxide.** The production process of methyl and / or ethyl esters (biodiesel) from frying oil residues using a mixture of basic catalysts based on lithium hydroxide (LiOH), it is a mixture of basic metal catalysts (NaOH + LiOH and KOH + LiOH) which increases the conversion efficiency of frying oil (without pretreatment) to biofuel (biodiesel), so that this process contributes to a new mixture of basic metallic catalysts that leads to the transformation of a harmful residue into clean fuel of a renewable origin and without the presence of sulfur or heavy metals.
ES2660207	Univ Malaga et al. (ES)	**High efficiency method and catalyst for the production of alkyl esters from fatty acids with acid catalysis.** High efficiency method that obtains superior conversions up to 98% for the production of alkyl esters from fatty acids by acid catalysis, that is produced in an isothermal tubular reactor preferably placed in a vertical position, with liquid methanol and fat with up to 100% free fatty acids and less than 1% moisture, preferably with a residence time between 15 and 70 minutes, and with a molar excess of methanol/ fat over the stoichiometric ratio in reactions in a stage of 12-18:1. In two stages: the first stage calls for a molar excess of methanol of 4-6:1 and a second stage of 30-80:1, preferably 30-40:1. It also refers to a line of heterogeneous acid catalysts, which allow obtaining high yields in maximum times of 1 hour, representing a differentiating fact with respect to previous publications. They have a non-reducible mixed oxide base and are functionalised with acids derived from sulphonic acid.
BR102015008335	Univ Minas Gerais (BR)	**Process of immobilization of enzymes in carbon nanotubes, product and use.** The invention relates to a process for the immobilization of enzymes, preferably lipases, in carbon nanotubes, for the use of the product in industrial processes using lipases as catalysts or reagents, such as the processes of transesterification for the production of biodiesel

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VT BIOMASA PATENTES

Boletín elaborado con la colaboración de:

Ministerio de Ciencia, Innovación y Universidades
Paseo de la Castellana, 162
28047 Madrid
Tel: 91 603 83 99
E-mail: consultas.sgecpp@mineco.es
www.mineco.es

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

Bioplat
C/ Doctor Castelo 10, 3ºC-D
28009 Madrid
Tel.: 91 307 17 61
E-mail: secretaria@bioplat.org
www.bioplat.org

CIEMAT
Avda. Complutense,40
28040 Madrid
Tel: 91 346 08 99
E-mail:uip@ciemat.es
www.ciemat.es