

Search query (3): [SP]: reivindicaciones 1. un reactor que produce hidrogeno caracterizado porque comprende una celda electrolitica (1.1) que tiene el anodo y el catodo separados selectivamente pero conectados materialmente por un sistema de membranas (1.2), y en donde los iones hidronio formados en el proceso de oxidacion en el anodo se transfieren a traves de dicho sistema de membranas (1.2) y reaccionan en el catodo, mientras que los iones hidroxilos formados en el catodo como resultado del equilibrio quimico del agua se transportan por migracion al anodo. 2. el reactor de la reivindicacion 1, en donde dicho sistema de membranas (1.2) esta compuesto por una membrana de intercambio protonico de nafion combinada con una membrana generica o de intercambio anionico. 3. el reactor de cualquiera de las reivindicaciones 1 o 2, donde el anodo esta conformado por placas metalicas (2.1) que estan ubicadas en el centro de la semicelda, y las cuales entran en contacto con la superficie que contiene el sistema de membranas para disminuir la distancia a las placas catodicas. 4. el reactor de cualquiera de las reivindicaciones 1 o 2, donde el catodo esta compuesto por un puente ubicado (3.3) en el fondo de la semicelda, el cual esta conectado al puente anodico (2.2) mediante un tornillo de acero inoxidable por medio de una pata en forma de l, y donde el tornillo debe estar por fuera del sistema liquido. 5. el reactor de la reivindicacion 4, donde las placas catodicas se dividen en dos grupos: dos placas auxiliares (3.2) que se ubican en las caras de la semicelda y 30 placas principales (3.1) que estan centradas en el cuerpo de la semicelda. 6. el reactor de acuerdo con cualquiera de las reivindicaciones anteriores, el cual comprende adicionalmente un sistema de puentes electricos (2.2 y 3.3) disenado para formar dos campos electricos (e1 y e2) perpendiculares entre si, siendo el campo electrico con direccion horizontal entre las dos semiceldas mayor al campo electrico perpendicular generado dentro del anodo. 7. el reactor de la reivindicacion 6, donde la relacion entre el campo electrico con direccion horizontal entre las dos semiceldas y el campo electrico perpendicular generado dentro del anodo es de (4:1). 8. el reactor de acuerdo con cualquiera de las reivindicaciones anteriores, caracterizado porque en el catodo hay agua y un electrolito conductor, mientras que en el anodo hay excrementos homogenizados. 9. el reactor de la reivindicacion 8, donde el electrolito conductor presente en el catodo es acido fosforico (h3p04). 10. el reactor de la reivindicacion 9, donde la obtencion de hidrogeno ocurre de la siguiente manera: a) la oxidacion de los excrementos homogenizados genera en el anodo iones hidronio, los cuales son atraidos por el puente electrico (2.2) ubicado en el fondo del anodo y a su vez son atraidos por el puente (3.3) y las placas catodicas (3.1 y 3.2), haciendo que ocurra transferencia de iones hidronio y moleculas de agua a traves de la membrana de nafion b) ya en el catodo, los iones hidronio se reducen sobre las placas catodicas (3.1 y 3.2) formando hidrogeno gaseoso (7 -/), luego de lo cual, y por el principio de le-chatelier, el equilibrio quimico se desplaza hacia el lado derecho produciendo iones hidroxilo y compensando la perdida de iones hidronio y c) parte de los iones hidroxilo se transportan por migracion desde el catodo hacia el anodo pasando por la membrana generica que hace parte del sistema de membranas (1.2), facilitando la cinetica de la reaccion de oxidacion de los excrementos en medio basico. claims 1. a reactor that produces hydrogen characterized in that it comprises an electrolytic cell (1.1) having the anode and the cathode separated selectively but connected by a system of materially membranes (1.2), and where the hydronium ions formed in the oxidation process at the anode are transferred through said membrane system (1.2) and react at the cathode, while the hydroxyl ions formed at the cathode as a result of the chemical balance of the water is transported by migration to the anode. 2. the reactor of claim 1, wherein said membrane system (1.2) is composed of a proton exchange membrane of nafion combined with a generic or anion exchange membrane. 3. the reactor of any of claims 1 or 2, wherein the anode is formed by metal plates (2.1) that are located in the center of the semicelda, and which come into contact with the surface containing the membrane system to decrease the distance to the cathode plates. 4. the reactor of any of claims 1 or 2, wherein the cathode is composed of a bridge located in the bottom of the semicelda (3.3), which is connected to the anodic bridge (2.2) by a stainless steel screw by means of a leg of the l-shaped, and wherein the screw must be on the outside of the liquid system. 5. the reactor of claim 4, wherein the cathode plates are divided into two groups: two plates (3.2) that are located on the faces of the primary plates (30 semicelda and 3.1) that are centered in the body of the semicelda. 6. the reactor according to any one of the preceding claims, which further comprises a system of electrical bridges (2.2 and 3.3) designed to form two electric fields (e1 and e2) perpendicular to each other, being the electric field with the horizontal direction between the two largest perpendicular to the electric field generated within the anode semiceldas. 7. the reactor of claim 6, wherein the ratio between the electric field with horizontal direction between the two and the semiceldas perpendicular electric field generated within the anode is (4:1). 8. the reactor according to any one of the previous claims, characterized in that the cathode there is water and a conductive electrolyte, while at the anode there is excrement homogenates. 9. the reactor of claim 8, wherein the conductive electrolyte present in the cathode is phosphoric acid (h3po4). 10. the reactor of claim 9, wherein the obtaining hydrogen occurs in the following manner: (a) the waste generated in the homogenates anode oxidation of the hydronium ions, which are attracted to the electrical bridge (2.2) located at the bottom of the anode and in turn are attracted by the bridge (3.3) and the cathodic plates (3.1 and 3.2), making transfer to occur hydronium ions and water molecules through the nafion membrane (b) already in the cathode, the hydronium ions are reduced on the cathode plates (3.1 and 3.2) forming hydrogen gas (7 -/), after which, and by the principle of le-chatelier, the chemical equilibrium is shifted to the right side producing hydroxyl ions and compensating for the loss of hydronium ions and (c) part of the hydroxyl ions are transported by migration from the cathode to the anode through the membrane generic that is part of the membranes (1.2), thereby facilitating the kinetics of the oxidation reaction of the droppings in basic medium.

Results: 9

Search history

Search FT=(proton exchange membrane and hydrogen and reactor and anode and cathode and electrolytic cell and organic and hydronium ions) and 1: IC=(C25B1/02) (Results 1)

Search FT=(proton exchange membrane and hydrogen and reactor and anode and cathode and electrolytic cell and organic and hydronium ions) 2: (Results 4)

Search [SP]: reivindicaciones 1. un reactor que produce hidrogeno caracterizado porque comprende una celda electrolitica (1.1) que tiene el anodo y el catodo separados selectivamente pero conectados materialmente por un sistema de membranas (1.2), y en donde los iones hidronio formados en el proceso de oxidacion en el anodo se transfieren a traves de dicho sistema de membranas (1.2) y reaccionan en el catodo, mientras que los iones hidroxilos formados en el catodo como resultado del equilibrio quimico del agua se transportan por migracion al anodo. 2. el reactor de la reivindicacion 1, en donde dicho sistema de membranas (1.2) esta compuesto por una membrana de intercambio protonico de nafion combinada con una membrana generica o de intercambio anionico. 3. el reactor de cualquiera de las reivindicaciones 1 o 2, donde el anodo esta conformado por placas metalicas (2.1) que estan ubicadas en el centro de la semicelda, y las cuales entran en contacto con la superficie que contiene el sistema de membranas para disminuir la distancia a las placas catodicas. 4. el reactor de cualquiera de las reivindicaciones 1 o 2, donde el catodo esta compuesto por un puente ubicado (3.3) en el fondo de la semicelda, el cual esta conectado al puente anodico (2.2) mediante un tornillo de acero inoxidable por medio de una pata en forma de l, y donde el tornillo debe estar por fuera del sistema liquido. 5. el reactor de la reivindicacion 4, donde las placas catodicas se dividen en dos grupos: dos placas auxiliares (3.2) que se ubican en las caras de la semicelda y 30 placas principales (3.1) que estan centradas en el cuerpo de la semicelda. 6. el reactor de acuerdo con cualquiera de las reivindicaciones anteriores, el cual comprende adicionalmente un sistema de puentes electricos (2.2 y 3.3) disenado para formar dos campos electricos (e1 y e2) perpendiculares entre si, siendo el campo electrico con direccion horizontal entre las dos semiceldas mayor al campo electrico perpendicular generado dentro del anodo. 7. el reactor de la reivindicacion 6, donde la relacion entre el campo electrico con direccion horizontal entre las dos semiceldas y el campo electrico perpendicular generado dentro del anodo es de (4:1). 8. el reactor de acuerdo con cualquiera de las reivindicaciones anteriores, caracterizado porque en el catodo hay agua y un electrolito conductor, mientras que en el anodo hay excrementos homogenizados. 9. el reactor de la reivindicacion 8, donde el electrolito conductor presente en el catodo es acido fosforico (h3p04). 10. el reactor de la reivindicacion 9, donde la obtencion de hidrogeno ocurre de la siguiente manera: a) la oxidacion de los excrementos homogenizados genera en el anodo iones hidronio, los cuales son atraidos por el puente electrico (2.2) ubicado en el fondo del anodo y a su vez son atraidos por el puente (3.3) y las placas catodicas (3.1 y 3.2), haciendo que ocurra transferencia de iones hidronio y moleculas de agua a traves de la membrana de nafion b) ya en el catodo, los iones hidronio se reducen sobre las placas catodicas (3.1 y 3.2) formando hidrogeno gaseoso (7 -/), luego de lo cual, y por el principio de le-chatelier, el equilibrio quimico se desplaza hacia el lado derecho produciendo iones hidroxilo y compensando la perdida de iones hidronio y c) parte de los iones hidroxilo se transportan por migracion desde el catodo hacia el anodo pasando por la membrana generica que hace parte del sistema de membranas (1.2), facilitando la cinetica de la reaccion de oxidacion de los excrementos en medio basico. claims 1. a reactor that produces hydrogen characterized in that it comprises an electrolytic cell (1.1) having the anode and the cathode separated selectively but connected by a system of materially membranes (1.2), and where the hydronium ions formed in the oxidation process at the anode are transferred through said membrane system (1.2) and react at the cathode, while the hydroxyl ions formed at the cathode as a result of the chemical balance of the water is transported by migration to the anode. 2. the reactor of claim 1, wherein said membrane system (1.2) is composed of a proton exchange membrane of nafion combined with a generic or anion exchange membrane. 3. the reactor of any of claims 1 or 2, wherein the anode is formed by metal plates (2.1) that are located in the center of the semicelda, and which come into contact with the surface containing the membrane system to decrease the distance to the cathode plates. 4. the reactor of any of claims 1 or 2, wherein the cathode is composed of a bridge located in the bottom of the semicelda (3.3), which is connected to the anodic bridge (2.2) by a stainless steel screw by means of a leg of the l-shaped, and wherein the screw must be on the outside of the liquid system. 5. the reactor of claim 4, wherein the cathode plates are divided into two groups: two plates (3.2) that are located on the faces of the primary plates (30 semicelda and 3.1) that are centered in the body of the semicelda. 6. the reactor according to any one of the preceding

claims, which further comprises a system of electrical bridges (2.2 and 3.3) designed to form two electric fields (e1 and e2) perpendicular to each other, being the electric field with the horizontal direction between the two largest perpendicular to the electric field generated within the anode semiceldas. 7. the reactor of claim 6, wherein the ratio between the electric field with horizontal direction between the two and the semiceldas perpendicular electric field generated within the anode is (4:1). 8. the reactor according to any one of the previous claims, characterized in that the cathode there is water and a conductive electrolyte, while at the anode there is excrement homogenates. 9. the reactor of claim 8, wherein the conductive electrolyte present in the cathode is phosphoric acid (h3po4). 10. the reactor of claim 9, wherein the obtaining hydrogen occurs in the following manner: (a) the waste generated in the homogenates anode oxidation of the hydronium ions, which are attracted to the electrical bridge (2.2) located at the bottom of the anode and in turn are attracted by the bridge (3.3) and the cathodic plates (3.1 and 3.2), making transfer to occur hydronium ions and water molecules through the nafion membrane (b) already in the cathode, the hydronium ions are reduced on the cathode plates (3.1 and 3.2) forming hydrogen gas (7 -/), after which, and by the principle of le-chatelier, the chemical equilibrium is shifted to the right side producing hydroxyl ions and compensating for the loss of hydronium ions and (c) part of the hydroxyl ions are transported by migration from the cathode to the anode through the membrane generic that is part of the membranes (1.2), thereby facilitating the kinetics of the oxidation reaction of the droppings in basic medium. (Results 9)

1) Family number: 68807071 (WO18044153A1)

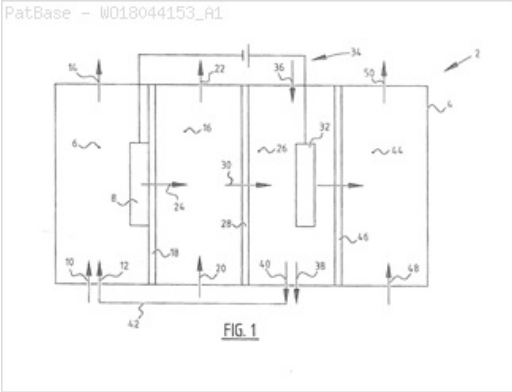
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Title: ELECTROCHEMICAL SYSTEM FOR RECOVERY OF COMPONENTS FROM A WASTE STREAM AND METHOD THERE FOR

Abstract: The invention relates to an electrochemical system and method for recovery of components from a waste stream. The system according to the invention comprises a reactor that comprises: - an anode compartment with an anode; - a cathode compartment with a cathode; - a feed compartment that is provided between the anode and cathode compartments or is integrally provided with one of these compartments; - one or more ion-exchange membranes separating the anode and cathode compartments; - a recovery compartment configured for recovering components, wherein the recovery compartment is separated from one or more compartments with a hydrophobic membrane; and - a circuit connecting the anode and the cathode, the circuit comprising a power source for providing an electric current.

Classifications:

International (IPC 8-9): C02F1/469 C02F101/16
C02F3/00 (Advanced/Invention);
C02F101/16 (Advanced/Non-invention)
CPC: C02F1/4693 C02F3/005 C02F2101/16 C02F2201/46115 C25B1/00
C25B9/08 C25B15/02



Family:

Publication number	Publication date	Application number	Application date
EP3504162 A1	20190703	EP20170728944	20170516
NL2017383 B1	20180308	NL20162017383	20160829
WO18044153 A1	20180308	WO2017NL50304	20170516

Priority:

NL20162017383 20160829 WO2017NL50304 20170516

Probable Assignee: W AND F TECH BV

Assignee(s): (std): W AND F TECH BV

Assignee(s): W AND F TECHNOLOGIES BV

Inventor(s): (std): KUNTKE PHILIPP ; HAMELERS HUBERTUS VICTOR MARIE ; SLEUTELS TOMAS HUBERTUS JOHANNES ANTONIUS ; SAAKES MACHIEL ; BUISMAN CEES JAN NICO ; MACHIEL SAAKES ; PHILIPP KUNTKE ; TOMAS HUBERTUS JOHANNES ANTONIUS SLEUTELS ; CEES JAN NICO BUISMAN ; HUBERTUS VICTOR MARIE HAMELERS

Agent(s): VERDIJCK GERARDUS; VERDIJCK GERARDUS JOHANNES CORNELIS

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KH KM KN KP KR KW KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

2) Family number: 54344168 (US2015017089A)

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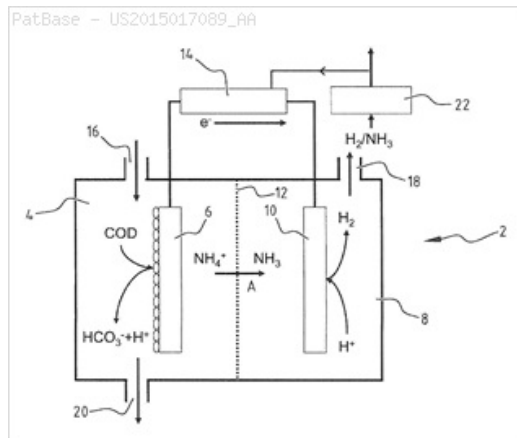
Title: METHOD FOR NITROGEN RECOVERY FROM AN AMMONIUM COMPRISING FLUID AND BIO-ELECTROCHEMICAL SYSTEM

Abstract: A method is disclosed for nitrogen recovery from an ammonium including fluid and a bio-electrochemical system for the same. In an embodiment, the method includes providing an anode compartment including an anode; providing a cathode compartment including a cathode, wherein the compartments are separated by at least one ion exchange membrane; providing the ammonium comprising fluid in the anode compartment and a second fluid in the cathode compartment; applying a voltage between the anode and the cathode; and extracting nitrogen from the cathode compartment.

Classifications:

International (IPC 8-9): B01D61/44 B01D61/46 C01B5/00 C02F1/20
C02F1/46 C02F1/467 C02F1/469 C02F101/16 C02F3/00 C02F3/28

C25B1/00 C25B1/02 C25B1/04 C25B1/08 C25B1/10 C25B11/06
C25B5/00 C25B9/00 C25B9/10 H01M8/06 H01M8/0606 H01M8/1018
H01M8/124 H01M8/22 (Advanced/Invention);
C02F1/467 C02F101/16 H01M8/1018 H01M8/124
H01M8/22 (Advanced/Non-invention)
CPC: C25B9/10 C01B5/00 C25B1/00 C25B1/02 C02F1/4676 C02F3/005
C02F2101/16 C02F2201/46115 C02F2201/4619 C25B5/00 H01M8/222
H01M2008/1095 H01M2008/1293 Y02E60/366
US: 204/252 205/343 205/617 423/580.1



Family:

Publication number	Publication date	Application number	Application date
CA2863227 AA	20140709	CA20132863227	20130110
CN104220644 A	20141217	CN201380013404	20130110
CN104220644 B	20170329	CN201380013404	20130110
DK2802684 T3	20190128	DK20130703891T	20130110
EP2802684 A1	20141119	EP20130703891	20130110
EP2802684 B1	20181003	EP20130703891	20130110
ES2695273 T3	20190103	ES20130703891T	20130110
JP2015511991 T2	20150423	JP20140552148T	20130110
JP6114941 B2	20170419	JP20140552148T	20130110
NL2008090 C	20130715	NL20122008090	20120110
NL2008090 C2	20130715	NL20122008090	20120110
US2015017089 AA	20150115	US20130371226	20130110
US9725812 BB	20170808	US20130371226	20130110
WO13105854 A1	20130718	WO2013NL50012	20130110

Priority:

NL20122008090 20120110 EP20130703891 20130110 WO2013NL50012 20130110

Probable Assignee: W AND F TECHNOLOGIES BV

Assignee(s): (std): MAGNETO SPECIAL ANODES BV ; STICHTING WETSUS CT OF EXCELLENCE FOR SUSTAINABLE WATER TECHNOLOGY ; STICHTING WETSUS CT EXCELLENCE SUSTAINABLE WATER TECHNOLOGY ; W AND F TECH BV

Assignee(s): W AND F TECHNOLOGIES BV ; MAGNETO SPECIAL ANODES BVCALANDSTRAAT 109NL-3125BASCHIEDAMNL ; SLEUTELS TOMAS HUBERTUS JOHANNES ANTONIUS ; SAAKES MACHIEL ; STICHTING WETSUS CENTRE OF EXCELLENCE FOR SUSTAINABLE WATER TECHNOLOGY ; BUISMAN CEES JAN NICO ; HAMELERS HUBERTUS VICTOR MARIE ; KUNTKE PHILIPP

Inventor(s): (std): BUISMAN CEES JAN NICO ; HAMELERS HUBERTUS VICTOR MARIE ; SLEUTELS TOMAS HUBERTUS JOHANNES ANTONIUS ; KUNTKE PHILIPP ; SAAKES MACHIEL ; HAMELERS HUBERTUS VICTOR ; SLEUTELS TOMAS HUBERTUS ; BUISMAN CEES JAN

Inventor(s): KUNTKE PHILIPPNL ; SLEUTELS TOMAS HUBERTUS JOHANNES ANTONIUSNL ; HAMELERS HUBERTUS VICTOR MARIENL ; SAAKES MACHIELNL ; BUISMAN CEES JAN NICNL

Agent(s): GOWLING LAFLEUR HENDERSON LLP; GOWLING WLG CANADA LLP; VERDIJCK GERARDUS; ELZABURU SLP ELZABURU SLP; HARNESS DICKEY AND PIERCE PLC; VERDIJCK GERARDUS JC

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT HW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

3) Family number: 70158201 (WO19106456A1)

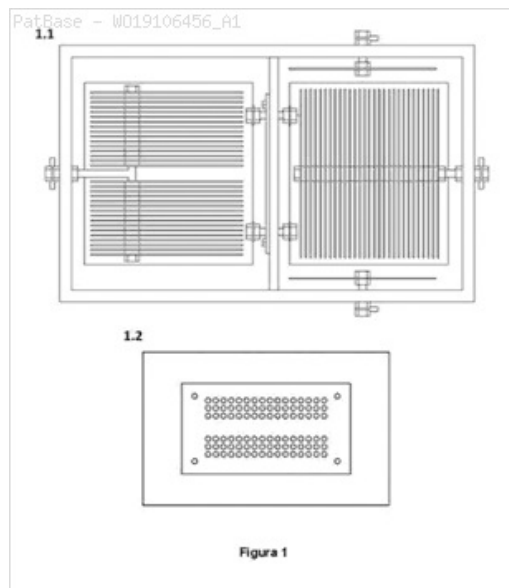
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Title: REACTOR THAT PRODUCES HYDROGEN BY REDUCTION OF HYDRONIUM IONS PRESENT IN THE CHEMICAL EQUILIBRIUM IN WATER AND BY OXIDATION OF THE ORGANIC MOLECULES FOUND IN EXCREMENT

Abstract: An electrochemical reactor designed to increase the efficiency of hydrogen production from faeces and urine (excrement) is disclosed. Said reactor comprises two half-cells separated in a selective manner, a system of membranes separating the half-cells (comprising a proton-exchange membrane and an anion-exchange membrane) and a system of electrical bridges that allow two mutually perpendicular electrical fields to be formed, with the electrical field in the horizontal direction between the two half-cells being greater than the vertical electrical field generated within the anode. The half-cells have a configuration of two resistances in series, which allows the potential of each compartment to be controlled in an independent and complementary manner by adjusting the conductivity of the solutions in the half-cells. Said configuration allows the consumption of energy to form hydrogen to be significantly reduced in comparison with conventional electrolytic cells using water in an alkaline medium by combining the chemical processes of electrolysis (anode) and the law of chemical equilibrium (cathode). International patent classification: Electrolytic production of hydrogen or oxygen (C25B1/04) - Production of hydrogen or gaseous mixtures containing hydrogen by decomposition of gaseous or liquid organic compounds (C01B3/22) Technological sector: Chemical processes

Classifications:

International (IPC 8-9): C01B3/22 C02F1/461 C02F101/16 C25B1/02 C25B1/04 C25B9/08 C25B9/12 F02B43/10 (Advanced/Invention);

**Family:**

Publication number	Publication date	Application number	Application date
CO20170012602 A1	20180220	CO20170012602	20171207
WO19106456 A1	20190606	WO20181858596	20181101

Priority:

CO20170012602 20171207

Probable Assignee: LOZADA CASTRO JUAN JOSE**Assignee(s):** (std): LOZADA CASTRO JUAN JOSE**Assignee(s):** JUAN JOSE LOZADA CASTRO**Inventor(s):** (std): LOZADA CASTRO JUAN JOSE**Inventor(s):** JUAN JOSE LOZADA CASTRO**Agent(s):** MANUEL ANTONIO GUERRERO GAITAN; GUERRERO GAITAN MANUEL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

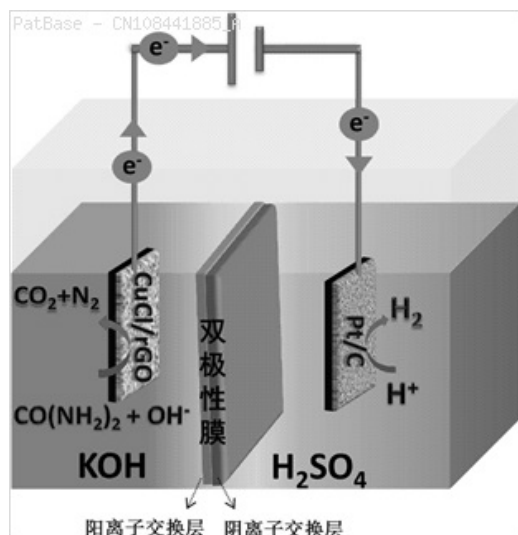
4) Family number: 70871380 (CN108441885A)

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Title: COMPOSITE MATERIAL AND APPLICATION THEREOF IN DEVICE FOR PRODUCING HYDROGEN FROM ELECTROLYZED WATER OF ACID-ALKALI ELECTROLYTIC TANK WITH ASSISTANCE OF UREA OXIDATION

Abstract: The invention discloses a composite material and application thereof in a device for producing hydrogen from electrolyzed water of an acid-alkali electrolytic tank with assistance of urea oxidation. The composite material comprises nano cuprous chloride particles and reduced graphene oxide, and the nano cuprous chloride particles are loaded in the reduced graphene oxide. The device comprises an anode plate, a cathode plate, a bipolar film, anode chamber electrolyte and cathode chamber electrolyte; and an anode catalyst is a reduced graphene oxide composite material loaded with the nano cuprous chloride particles; and the anode chamber electrolyte is a urea-containing alkali solution, and the cathode chamber electrolyte is an acidic solution. The hydrogen production initial voltage of the device is only about 0.62 V, and is far lower than a theoretical initial voltage (1.23 V) of water decomposition in a traditional water decomposition system, and more than 49.6 percent of energy consumption is reduced. The device is low in price, simple to operate and excellent in performance, can relieve urea pollution, and has wide application prospect in aspects of energy conservation and storage and the like.

Classifications:**International (IPC 8-9):** C25B1/10 C25B11/06 (Advanced/Invention)**CPC:** C25B11/04 C25B1/10 C25B11/0478 Y02E60/366



Family:

Publication number	Publication date	Application number	Application date
■ CN108441885 A	20180824	CN201810391777	20180427

Priority:

CN201810391777 20180427

Probable Assignee: FUJIAN INST RES STR MATTER CAS

Assignee(s): (std): FUJIAN INST OF RES ON STRUCTURE OF MATTER CHINESE ACADEMY OF SCIENCES ; FUJIAN INST OF RESEARCH ON STRUCTURE OF MATTER CHINESE ACADEMY OF SCIENCES ; FUJIAN INST RES STR MATTER CAS

Inventor(s): (std): WANG GENXIANG ; WEN ZHENHAI

5) Family number: 56700439 (CN103864201A)

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Title: METHOD FOR MICROBIAL ELECTROLYTIC PREPARATION OF HYDROGEN BY USE OF SOURCE SEPARATED URINE

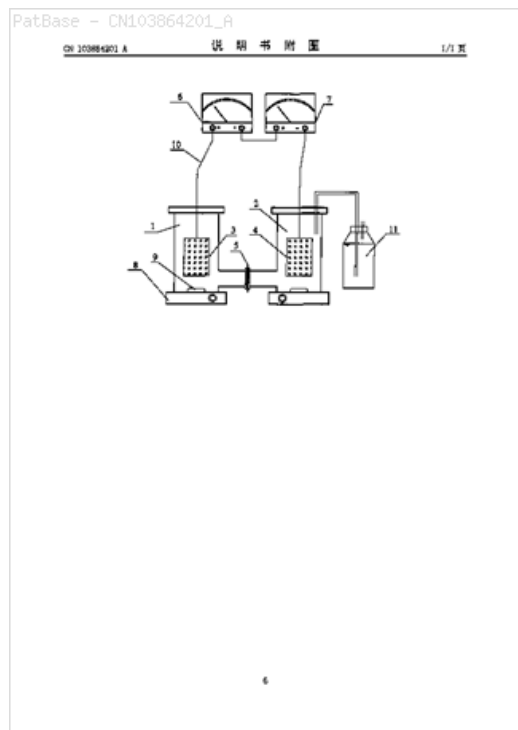
Abstract: The invention discloses a method for microbial electrolytic preparation of hydrogen by use of source separated urine. A kind of microorganisms capable of oxidizing ammonia under anaerobic conditions and simultaneously capable of transferring generated electrons to a solid electrode can be screened and enriched from the nature by use of a microbial electrolysis cell. The kind of microorganisms are attached on positive pole surface, when the source separated urine is provided to a positive pole chamber, the ammonia in the urine is anaerobically oxidized, and the generated electrons are driven by an applied voltage to transfer to a negative pole. The generated electrons are bonded with protons generated by positive pole oxidation for preparation of the hydrogen, so that the purpose of microbial electrolytic preparation of the hydrogen by use of the source separated urine as a raw material can be achieved.

Classifications:

International (IPC 8-9): C02F1/461 C02F3/00

C25B1/04 (Advanced/Invention)

CPC: Y02E60/366



Family:

Publication number	Publication date	Application number	Application date
 CN103864201 A	20140618	CN201210550132	20121218

Priority:

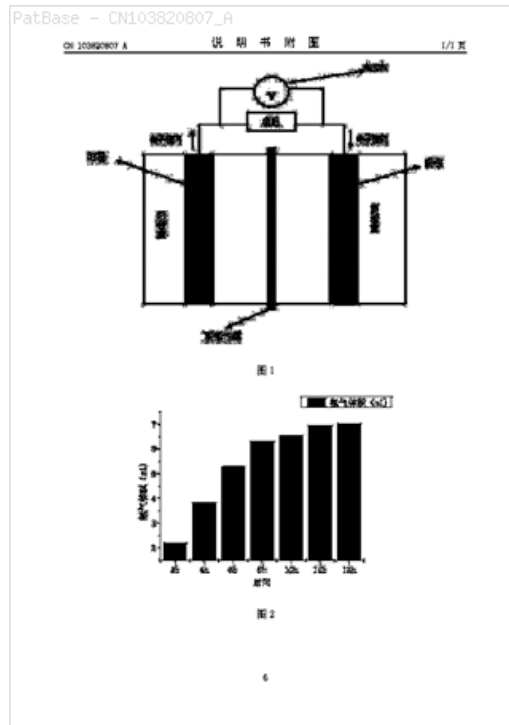
CN201210550132 20121218

Probable Assignee: RES CT ECO ENVIRONMENTAL SCIEN**Assignee(s):** (std): RES CT ECO ENVIRONMENTAL SCIEN ; RESEARCH CENTRE FOR ECO ENVIRONMENTAL SCIENCES CHINESE ACADEMY OF SCIENCES**Assignee(s):** RESEARCH CENTER FOR ECO ENVIRONMENTAL SCIENCES CHINESE ACADEMY OF SCIENCES**Inventor(s):** (std): ZHU SHIKUN ; LIU YINGHAO ; FAN BIN ; QU BO**6) Family number: 56509485 (CN103820807A)**

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Title: DEVICE AND METHOD FOR PRODUCING HYDROGEN AND GENERATING ELECTRICITY

Abstract: The invention discloses a device and a method for producing hydrogen and generating electricity. The device comprises an electrochemical tank and an ion exchange membrane arranged inside the electrochemical tank, wherein the electrochemical tank is divided into an anode chamber and a cathode chamber by the ion exchange membrane; an anode and a cathode are arranged in the anode chamber and the cathode chamber respectively, and are connected with a resistance through a wire. The method and the device are characterized in that the anode comprises a catalyzer which can electro-oxidizing corresponding substrates with high efficiency, and an anode base; the cathode is made of a material with lower hydrogen evolution overpotential; the substrates and a neutral or alkaline electrolyte solution are accommodated in the anode chamber, a neutral or acidic electrolyte solution is accommodated in the cathode chamber, and the substrates are catalyzed and oxidized by the catalyzer, and then produce hydrogen under the action of the cathode chamber. The device and the method for producing hydrogen and generating electricity can produce hydrogen in the case that direct current is not provided, and can generate electricity; in addition, the device and the method can be used as a storage technology for hydrogen, and have favorable application prospects.

Classifications:**International (IPC 8-9):** C25B1/10 (Advanced/Invention)**CPC:** Y02E60/366 Y02P20/126**Family:**

Publication number	Publication date	Application number	Application date
 CN103820807 A	20140528	CN201410076942	20140304
 CN103820807 B	20170208	CN201410076942	20140304

Priority:

CN201410076942 20140304

Probable Assignee: UNIV XI AN JIAOTONG**Assignee(s):** (std): UNIV XI AN JIAOTONG ; XI AN JIAOTONG UNIV**Inventor(s):** (std): FU RONG ; WANG YUNHAI ; FANG XIAOWEN ; CHEN QINGYUN**7) Family number: 49702504 (US2011243823A)**

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Title: SELECTIVE CATALYTIC REDUCTION VIA ELECTROLYSIS OF UREA

8) Family number: 63676903 (WO16153341A9)

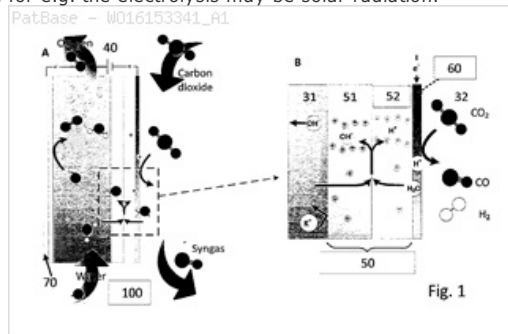
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Title: BIPOLAR MEMBRANE ELECTRODE ASSEMBLY FOR FUEL GENERATION

Abstract: The present invention is in the field of forming a chemical fuel, such as by electrolysis of water thereby forming hydrogen. Alternative approaches relate to forming hydro gen also a hydrocarbon, syngas, and an alcohol may be formed. Based on readily available fluids these chemical fuels can be produced. A source for e.g. the electrolysis may be solar radiation.

Classifications:**International (IPC 8-9):** C25B1/00 C25B1/10 C25B13/04

C25B9/10 (Advanced/Invention)

CPC: C25B1/10 C25B1/00 C25B9/10 C25B13/04 Y02E60/366 Y02E70/10**Family:**

Publication number	Publication date	Application number	Application date
NL2014500 A1	20161010	NL20152014500	20150320
NL2014500 B1	20170119	NL20152014500	20150320
WO16153341 A1	20160929	WO2016NL50189	20160317
WO16153341 A4	20161215	WO2016NL50189	20160317
WO16153341 A9	20161117	WO2016NL50189	20160317

Priority:

NL20152014500 20150320

Probable Assignee: UNIV DELFT TECH**Assignee(s):** (std): TECHNISCHE UNIV DELFT ; UNIV DELFT TECH**Assignee(s):** TECHNISCHE UNIVERSITEIT DELFT**Inventor(s):** (std): VERMAAS DAVID ARIE ; SMITH WILSON ABELE ; DAVID ARIE VERMAAS ; WILSON ABELE SMITH**Agent(s):** VOGELS LEONARD JOHAN PAUL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

9) Family number: 34243914 (US2008105624A)

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Title: METHOD FOR OXIDATIVE TREATMENT OF AQUEOUS LIQUIDS

Abstract: The invention relates to a method for oxidative treatment of aqueous liquids by means of oxidants. In this method, the aqueous liquid is passed through an electrolysis reactor, in which highly aggressive oxidants (OH^- , O_3 , H_2O_2) are produced in the electrochemical decomposition of the water. Black and/or grey water is used as the aqueous liquid, which is liberated from coarse particles and mechanically broken up thereafter, before it is passed into the electrolysis reactor. Gaseous portions are released and inorganic residual components are filtered out. The remaining residual liquid, which consists substantially of water, can be introduced into a fresh, wash- and/or rinse water system. (only Figure)

Classifications:**International (IPC 8-9):** B01D35/06 C02F1/46 C02F1/461 C02F1/467

C02F1/72 C02F103/00 (Advanced/Invention);

C02F1/461 C02F1/72 C02F103/00 C25B11/06 (Advanced/Non-invention);

B01D35/06 C02F1/46 C02F1/461 C02F1/72 (Core/Invention);

C25B11/00 (Core/Non-invention)

International (IPC 1-7): C02F1/461 C02F1/72**CPC:** Y02A20/212 C02F1/4672 C02F1/722 C02F2001/46138

C02F2001/46142 C02F2001/46185 C02F2103/002 C02F2103/005

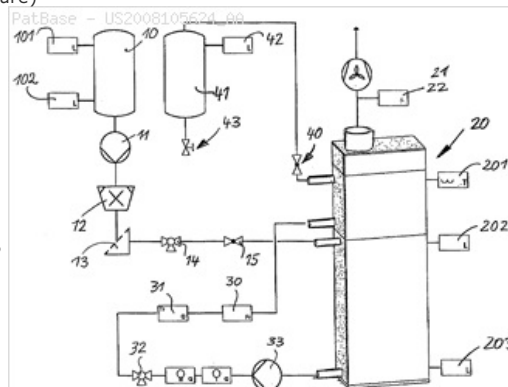
C02F2201/001 C02F2201/009 C02F2201/46115 C02F2209/02

C02F2209/42 C02F2301/043

European: C02F1/467B M02F1/461B2J2 M02F1/461B2J2B M02F1/461B6B

M02F1/72C M02F103/00C M02F103/00E M02F201/00A M02F201/00P

M02F201/461B4 M02F209/02 M02F209/42 M02F301/04B

US: 210/748 210/748.17 210/748.170P 210/748.19 210/748.190S**Family:**

Publication number	Publication date	Application number	Application date
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WO07022844 A1	20070301	WO2006EP07362	20060725

Priority:

DE200510040367 20050826 WO2006EP07362 20060725

Probable Assignee: EVAC GMBH

Assignee(s): (std): EHFAG GMBKH ; EVAC GMBH ; WOERMCKE HANS ; WORMCKE HANS

Inventor(s): (std): WOERMCKE HANS ; HANS WORMCKE ; VERMKE KHANS ; WORMCKE HANS

Agent(s): FETHERSTONHAUGH AND CO; GLAESER JOACHIM; OSUGA YOSHIYUKI; MEREK BLACKMON AND VOORHEES LLC

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW