

2015

BOLETIN AGUA

DESALINIZACIÓN

TENDENCIAS TECNOLÓGICAS EN FUNCIÓN

DE PATENTES

UNIDAD TERRITORIAL DE VIGILANCIA
TECNOLÓGICA E INTELIGENCIA COMPETITIVA



IDITS

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El presente Boletín fue diagramado en el marco de la **Unidad Territorial de Vigilancia Tecnológica e Inteligencia Competitiva** desarrollada en el marco de la Carta Intención firmadas por el MINCyT y el IDITS.

La experiencia se puso en marcha a partir de marzo de 2013 mediante la conformación de una Unidad conformada por trece instituciones del sector científico y académico y organismos del estado provincial y nacional.

El sector seleccionado fue **AGUA** y los productos resultantes de la experiencia son dos boletines de tendencias tecnológicas en función de patentes.

El presente boletín hace referencia a las tendencias más innovadoras en el tema **DESALINIZACION**, las cuales se ponen en evidencia a través de las últimas patentes registradas .

Este trabajo fue editado por dos de las instituciones que constituyen la Unidad, ellos son el **Observatorio Vitivinícola Argentino** y el **IDITS**. Es de esperar que la información reflejada en el presente informe sea de interés para nuestra provincia.

Según la Asociación Internacional de Desalación, unas 17.000 desaladoras en 120 países están actualmente en funcionamiento. Los principales países que han recurrido a esta tecnología para disponer de agua potable están en la península arábiga, sobre todo Arabia Saudí y Emiratos Árabes Unidos, seguidos de España, Estados Unidos y China. Pekín anunció a principios de 2012 un plan para alcanzar una capacidad desaladora de casi 2,5 millones de metros cúbicos diarios en el horizonte de 2015.

Las empresas francesas responden también a las necesidades de desalar agua de mar de Argelia. Las autoridades de este país han decidido aumentar de forma significativa el número de plantas de aquí a 2019. Todos estos proyectos empujan a otras empresas galas de energía a lanzarse en la misma aventura. El mercado mundial de la desalación, estimado en 7.800 millones de dólares en 2010, alcanzaría 18.300 millones de dólares en 2016.

Fuente : epo
Fecha : 20/11/2014

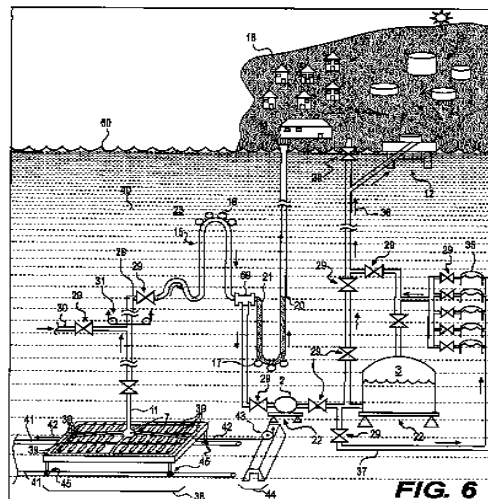
LARGE VOLUME SUB-SEA WATER DESALINATION REVERSE OSMOSIS SYSTEM, METHODS, AND APPARATUS

SISTEMA DE DESALINIZACIÓN DE AGUA SUBMARINA DE ÓSMOSIS INVERSA. METODOS Y APARATOS

A reverse osmosis sub-sea desalination system is disclosed. The reverse osmosis system may include a reverse osmosis station configured to generate fresh water from salty water, a storage tank configured to store fresh water downstream of the reverse osmosis station, and a pump fluidly connected to the reverse osmosis station and the storage tank. The reverse osmosis station, the storage tank, and the pump may be disposed at one or more depths beneath a surface of a body of salty water.

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Patent Application Publication Nov. 20, 2014 Sheet 6 of 10 US 2014/0339169 A1



Fuente : epo
Fecha : 13/11/2014

MULTISTAGE FILTRATING PRE-TREATMENT FOR DESALINATION OF OILFIELD PRODUCED WATER

DESALINIZACIÓN DEL AGUA PRODUCIDA EN UNA ZONA PETROLERA A TRAVÉS DE UN PRETRATAMIENTO FILTRANTE EN VARIAS ETAPAS

A method and system for treating oilfield produced water is disclosed. The method includes passing oilfield produced water through a chain of filters, first filter configured to filter particles of a size larger than 10 [μ]m from the water, a second filter configured to filter remaining particles of a size larger than 2 [μ]m from the water and a third filter configured to filter remaining particles of a size larger than 0.5 [μ]m from the water and automatically cleaning at least one of the filters.

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Fuente : epo
Fecha : 11/11/2014

METHOD AND APPARATUS FOR SOLAR DESALINATION

MÉTODO Y APARATO PARA LA DESALINIZACIÓN DE AGUA POR ENERGÍA SOLAR

Method and apparatus for desalination wherein a heating grid containing a fluid is used to heat the fluid to a vaporized state using energy provided by compound magnifying lens focusing solar energy directly onto the grid wherein the vapor from the grid system is transmitted to a steam turbine wherein electricity is generated to charge a battery while the vapor from the steam

turbine is conducted to a condenser wherein the vapor is cooled and fresh water is provided from the condensate. The remaining fluid from the condenser is pumped back into a reservoir for storage while waiting to be conducted into the heating grid. The magnifying lens and grid is rotated for alignment with the sun.

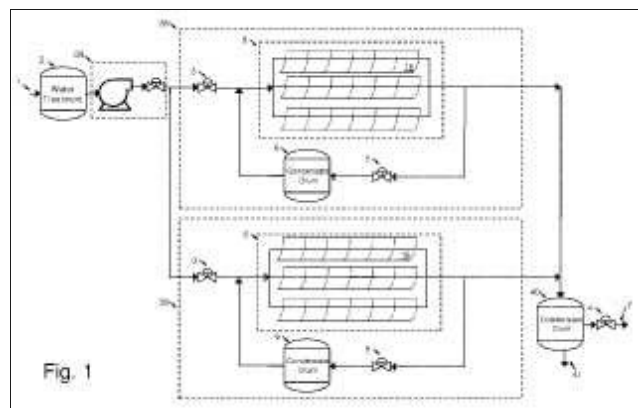
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Fuente : epo
Fecha : 06/11/2014

DIRECT SOLAR STEAM GENERATION

GENERACIÓN DE VAPOR A TRAVÉS DE ENERGIA SOLAR

Solar energy generates steam in a "once-through" configuration without recirculation, with closely managed steam quality, to produce wet steam from high-contaminant feed water without scaling or fouling. Feed water is pressurized, preheated, and evaporated in a series of pipes exposed to concentrated solar energy to produce a water-steam mixture for direct distribution to an industrial process such as enhanced oil recovery or desalination. Water flow rates are managed based on measurements of solar energy and steam production to manage variations in the solar energy. Steam generator piping system uses continuous receiver pipe that is illuminated by segmented parabolic mirrors enabled to track the sun. Provisions for steam generator piping recurring maintenance are provided. Thermal energy from hot condensate and/or from low quality steam is recaptured and warms inlet water.



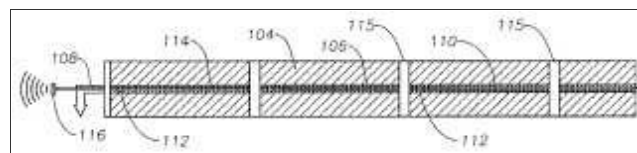
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Fuente : epo
Fecha : 30/10/2014

INTEGRATED SYSTEM FOR MONITORING PERMEATE QUALITY IN WATER TREATMENT FACILITIES

SISTEMA INTEGRADO PARA LA MONITORIZACIÓN CONTINUA DE PERMEADO DE ELEMENTOS Y CALIDAD EN UNA PLANTA DE TRATAMIENTO Y DESALINIZACIÓN DE AGUA.

The invention provides a method and apparatus for continuous monitoring of permeate from membrane elements in a water treatment plant, including a desalination plant. The apparatus includes a probe that includes multiple sensors such that at least one sensor is associated with each membrane element. Each sensor is coupled to a node, which is configured to communicate a signal associated with the permeate quality to a central node sink. The node may communicate wirelessly with the node sink.



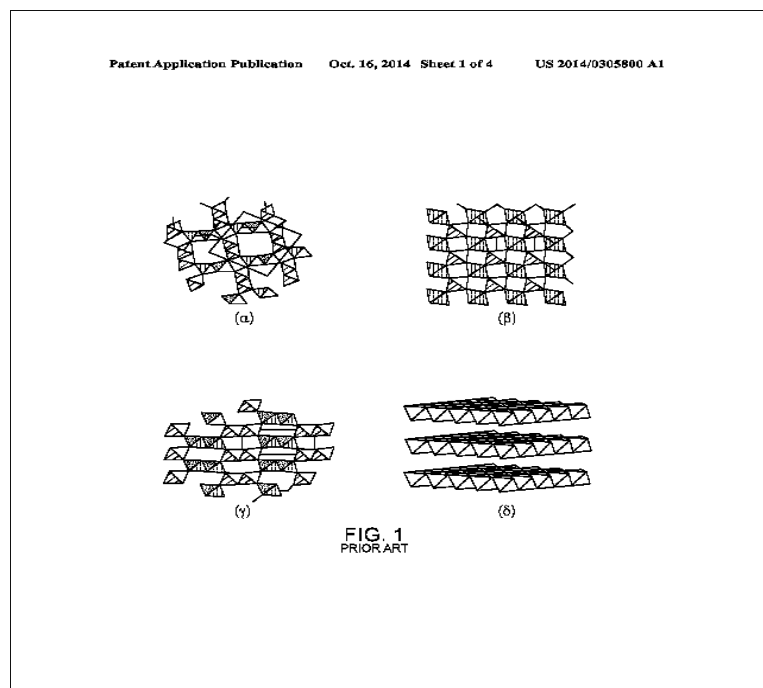
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Fuente : epo
Fecha : 16/10/2014

SEA WATER DESALINATION SYSTEM

SISTEMA PARA LA DESALINIZACIÓN DE AGUA DE MAR

There is disclosed an electrochemical cell for treating water comprising at least one water chamber configured to hold water to be treated at least one redox electrode comprising reactants capable of accepting and having a reversible redox reaction with at least one negative ion in the water at least one intercalation electrode capable of accommodating and intercalating at least one positive ion in the water, wherein the intercalation electrode is immersed in the water chamber or separated from the water chamber by an optional porous separator and an anion exchange membrane separating the redox electrode from the water chamber. The cell can be used to desalinate water having a wide range of salinities, including sea water, and brackish water. The cell can also be used to collect salt, which can subsequently used to concentrate industrial brine. Methods for using the electrochemical cell to treat water, such as desalinate saline solutions are disclosed. Also disclosed are methods for concentrated brine production for making salt.



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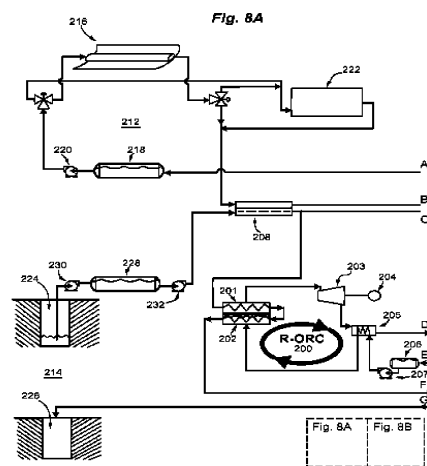
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HYBRID THERMAL POWER AND DESALINATION APPARATUS AND METHODS

CENTRAL TÉRMICA HÍBRIDA Y APARATOS Y MÉTODOS DESALINIZACIÓN

Rankine Cycle power generation facility having a plurality of thermal inputs and at least one heat sink, where the heat sink includes a thermal chimney or a natural convective cooling tower. In a preferred embodiment, the power facility generates electricity and/or fresh water with a zero carbon footprint, such as by using a combination of solar and geothermal heating to drive a Rankine Cycle heat engine. In one embodiment, a thermal stack is mounted in the base of the thermal chimney, the thermal stack for using waste heat from the plurality of thermal inputs to drive a natural convective flow of air in the thermal chimney, the convective flow having sufficient momentum to drive additional power generation in an air turbine mounted in the chimney and to drive an evaporative cycle for concentratively extracting fresh water from geothermal brines.

Patent Application Publication Oct. 9, 2014 Sheet 6 of 21 US 2014/0298806 A1



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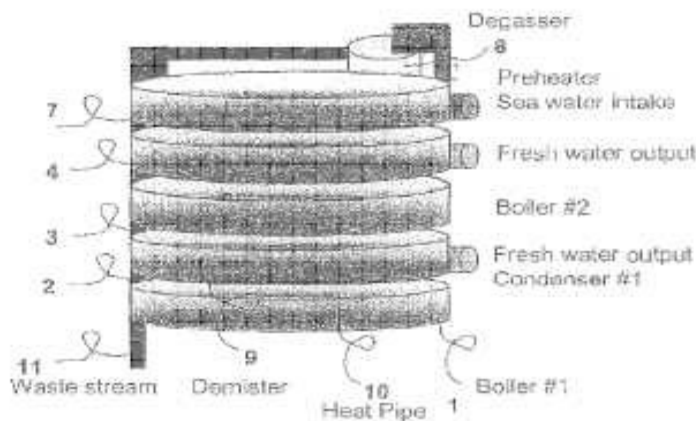
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LARGE-SCALE WATER PURIFICATION AND DESALINATION

GRAN ESCALA DE DEPURACIÓN Y DESALINIZACIÓN DEL AGUA

Embodiments of the invention provide systems and methods for water purification and desalination. The systems have a preheater, a degasser, multiple evaporation chambers with demisters, heat pipes, and a control system, wherein the control system permits continuous operation of the purification and desalination system without requiring user intervention or cleaning. The system is capable of recovering heat from each distillation stage, while removing, from a contaminated water sample, a plurality of contaminant types including: microbiological contaminants, radiological contaminants, metals, salts, volatile organics, and non-volatile organics.

Figure 1-A: Double Distillation Configuration



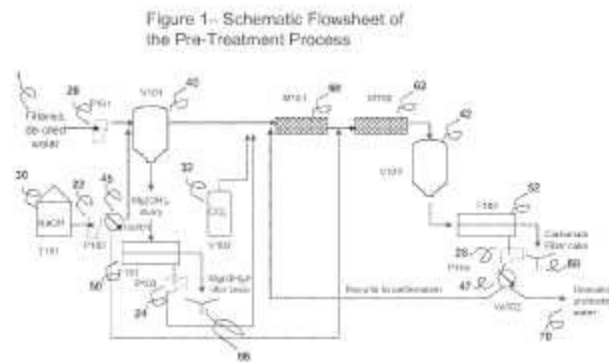
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Fuente : epo
Fecha : 18/09/2014

INDUSTRIAL WATER PURIFICATION AND DESALINATION

DESALINIZACIÓN Y PURIFICACIÓN DEL AGUA A GRAN ESCALA

This invention relates to the field of water purification and desalination. In particular, embodiments of the invention relate to systems and methods of removing essentially all of a broad spectrum of impurities from water in an automated industrial process that requires minimal cleaning or maintenance during the course of several months to several years, with relatively high yields of product water per unit of input water, flexibility with respect to energy sources, compact design with a low industrial foot-print, the ability to recover valuable by-products, and ultra-low energy requirements.



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Fuente : epo
Fecha : 18/07/2014

SEAWATER DESALINATION SYSTEM

SISTEMA DE DESALINIZACIÓN DE AGUA DE MAR

The present invention relates to a non-effluent-discharge high-efficiency seawater desalination system and a desalination method using the same system. More particularly, the present invention relates to a non-effluent-discharge high-efficiency seawater desalination system comprising: a condensing and evaporating tank for introducing raw water and evaporating and condensing the raw water with a heating unit a vapor turbo-compressor for introducing vapor generated in the condensing and evaporating tank and discharging high-temperature vapor that is generated by compressing and re-heating the vapor a condensate line arranged in the condensing and evaporating tank to discharge the heat of the high-temperature vapor, which has been discharged from the vapor turbo-compressor, to the raw water stored in the condensing and evaporating tank, thus heating the raw water and condensing the high-temperature vapor a treated water storage tank connected to the condensate line to adjust the condensate condensed in the condensate line as treated water and an evaporating and condensing unit for introducing the condensate condensed in the condensing and evaporating tank and evaporating the condensate.

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Fuente : epo
Fecha : 17/07/2014

SEAWATER DESALINATION UNIT

UNIDAD DE DESALINIZACIÓN DE AGUA DE MAR

A seawater desalination unit is disclosed, which comprises: a frame, an exit filtration part, and a water drawing part. The frame is configured with a reservoir,

a water intake pipe and a water discharge pipe in a manner that the water intake pipe is connected to the reservoir respectively via one end thereof, while allowing a first check valve to be disposed at a position between the reservoir and the water intake pipe, and the water discharge pipe is connected to the second filtration part and the reservoir respectively via two opposite ends thereof, while allowing a second check valve to be disposed at a position between the high-pressure reservoir and the water discharge pipe. Moreover, the water drawing part is arranged in fluid communication with the water intake pipe.

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Fuente : epo
Fecha : 03/07/2014

WATER DESALINATION SYSTEM

SISTEMA DE DESALINIZACIÓN DE AGUA

In a system for generating potable water by water desalination using a reverse osmosis filter having a product outlet and a reject outlet, a system for remineralization of the potable water comprising means for collecting lime or calcium carbonate from a stream out of the reject outlet, and means for adding lime or calcium carbonate to a stream out of the product outlet. The means for collecting lime or calcium carbonate can subsequently be used for adding lime or calcium carbonate to the stream out of the product outlet.

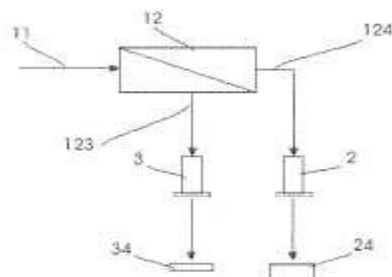


Fig. 6A

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Fuente : epo
Fecha : 02/07/2014

SOLAR-POWERED SEAWATER DESALINATION DEVICE

DISPOSITIVO DE DESALACIÓN DE AGUA DE MAR CON ENERGÍA SOLAR

The utility model discloses a solar-powered seawater desalination device and belongs to the field of seawater desalination. The solar-powered seawater desalination device can be used for solving the problems that seawater desalination efficiency is low and cost is high in the prior art. The solar-powered seawater desalination device comprises a solar vacuum tube (1), a seawater tank (4), a water supplementing tank (6) and a fresh water tank (7), wherein the water supplementing tank (6) and the seawater tank (4) are respectively connected with the head end and the tail end of the solar vacuum tube (1) by virtue of a pipeline (3). The solar-powered seawater desalination device is applied to places with scarce fresh water resource, such as a ship and a sea island, solar energy is utilized for heating and distilling seawater, operation is easy, equipment is simple, and cost is reduced.

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Fuente : epo
Fecha : 23/06/2014

**PREMIERE CENTRALE HYDROELECTRIQUE A STOCKAGE
D~ENERGIE PAR POMPAGE AU MONDE FONCTIONNANT 24
HEURES SUR 24 SELON LA METHODE KRISHNA**

**INAUGURACIÓN DE LA PRIMER CENTRAL HIDROELECTRICA DE
ALMACENAMIEN-TO DE ENERGIA QUE FUNCIONA 24HS
CORRIDAS, DEACUERDO AL MÉTODO KRISHNA.**

My novel method is related to produce extra hydropower from DAMS and Pumped Storage Hydropower Plants operation 24 hours a day 365 days a year unlike the present Pumped Storage Hydropower Plants are operational only during peak hours. It comprises Turbine-Generators (4) to produce extra hydropower and Multi barrel syringes or Giant Syringes (9) and Automatic Locomotives (11) to discharge the water from underground (18) installed Big Water Tank into the above ground installed Water Tanks A and B as shown in the drawing and in Pumped Storage Hydropower Plants from Lower Reservoir to the Upper Reservoir. In my method in DAMS we can produce extra hydropower and make it available cheaper than the regular hydropower plants (DAMS). My novel method will solve the power crisis within 6 months everywhere in the world. We can use the cheap electricity produced in my method to produce hydrogen fuel cheaply to solve the energy crisis in the world. The cheap electricity produced in my method can be used in Desalination Plants to produce cheap drinking water and cheap water for agriculture purposes.

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Fuente : epo

Fecha : 28/05/2014

**HIGH-TEMPERATURE GAS COOLED REACTOR NUCLEAR
ELECTRIC POWER GENERATION AND SEA WATER
DESALINATION DEVICE**

**DISPOSITIVO PARA GENERACIÓN DE ENERGÍA ELECTRICA Y
DESALINIZACIÓN DE AGUA DE MAR A TRAVÉS DE UN
REACTOR NUCLEAR Y UN GAS DE ALTA TEMPERATURA
ENFRIADO.**

The invention provides a high-temperature gas cooled reactor nuclear electric power generation and sea water desalination device. A plurality of groups of Stirling generators and heat exchangers equivalent with the Stirling generators in number are arranged on the periphery of a high-temperature gas cooled reactor. One heat exchanger is communicated with the high-temperature gas cooled reactor via a gaseous helium loop pipe the heat inflow end air cylinder and a connecting pipe of the air cylinder and a heat regenerator of one group of Stirling generator are placed in the same heat exchanger a heat outflow end air cylinder and a connecting pipe of the air cylinder and a heat regenerator of one group of Stirling generator are placed in the same sea water vaporizing tank a generator is placed in a secondary sealed cavity in the center of a heat outflow end one fresh water condenser is mounted on one sea water vaporizing tank, so that a plurality of Stirling generator units capable of independently operating are formed. Electricity, fresh water and sea salt are jointly produced, so that the device is equal to a combination of one generation plant, a sea water desalination plant and one salt field. The device avoids emission, and is high in the utilization ratio of resources, economical, safe and environmental-friendly.

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Fuente : epo

Fecha : 10/03/2014

INHERENT SAFETY WATER COOLED REACTOR SYSTEM FOR THERMAL DESALINATION

MEDIDA DE SEGURIDAD INHERENTE AL SISTEMA DE REFRIGERADO DE UN REACTOR PARA LA DESALINIZACIÓN TÉRMICA DE AGUA.

The present invention relates to a unique safety water cooling reactor system for thermal fresh water and, more specifically, to a unique safety water cooling reactor system for thermal fresh water capable of comprising a water cooling reactor which uses water as a coolant and a moderator and which generates thermal energy through nuclear fission a fresh water system which is connected to the water cooling reactor and generates fresh water by receiving the thermal energy generated in the core of the water cooling reactor through a thermal exchanger a refueling water tank which is used in a state of refueling the nuclear

fuel of the water cooling reactor a steel container which surrounds the whole reactor system comprising the water cooling reactor and the refueling water tank and a fresh water storage tank which stores the fresh water produced in the fresh water system. The unique safety water cooling reactor system is used as a stable energy source with unique safety. The present invention is provided to remove various safety related systems according to the unique safety, thereby reducing construction costs and producing the economical fresh water. When a reactor system is within a provided temperature, the reactor system is used in various processes.

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Fuente : epo
Fecha : 05/03/2014

NUCLEAR POWER AND LOW TEMPERATURE MULTI-EFFECT SEA WATER DESALINATION COUPLING COGENERATION SYSTEM

UTILIZACIÓN DE ENERGÍA NUCLEAR PARA LA DESALINIZACIÓN DE AGUA DE MAR Y LA COGENERACION ECONOMICA DE AGUA DE BUENA CALIDAD Y ELECTRICIDAD.

The invention discloses a nuclear power and low temperature multi-effect sea water desalination coupling cogeneration system, belonging to the technical field of nuclear power utilization and low temperature multi-effect sea water desalination. The system comprises a small-sized nuclear reactor, a vapor generator, a turbine, a vapor converter, a vapor thermal compressor, a low temperature multi-effect evaporator and auxiliary equipment. In the system, the nuclear reactor provides energy so as to drive the vapor generator to generate high pressure vapor, the high pressure vapor enters the turbine and generates electricity through working, part of vapor is extracted out from the turbine to be offered to the vapor converter, the vapor converter heats up internal demineralized water through the heat of the vapor so as to generate secondary vapor, and the secondary vapor drives the vapor thermal compressor and the low temperature multi-effect sea water desalination system to generate fresh water. The system has the advantages that nuclear energy utilization is high in safety, the quality of generated fresh water is good, and electricity-water cogeneration is economic.

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SIMULATED GEONOMY METHOD FOR ATMOSPHERE CARBON ABSORPTION

MÉTODO GEONOMY SIMULADO PARA LA ABSORCIÓN DE LA ATMÓSFERA DE CARBONO

The invention provides a simulated geonomy method for atmosphere carbon absorption. The technical scheme is that the method comprises the following steps: simulating a sedimentation process of carbonate rocks, producing anthozoan organism skeleton carbonates by using a method of building barrier aprons manually, and producing ooidal inorganic particle carbonates by using a method of building a man-made lagoon and an oolith beach or a production plant of the particle carbonates. According to the invention, the sedimentation speed of carbonate sediments is quickened by using manners of putting oolite nuclear, adding deepwater nutrient salts, discharging sea water desalination strong brine and using a man-made swell device, so that the yield is increased, and a shore shallow sea simulated ground pump, a deep sea artificial island simulated ground pump and a desert surface simulated ground pump all capable of increasing the carbon absorption strength are formed. According to the method, the carbonate sediments capable of purifying and absorbing atmosphere CO are widely and largely produced in the universe and earth level, a solution way for the most rigorous challenge which human faced of greenhouse gases is provided meanwhile, co-products of calcium carbonate industrial mineral products and the like and other benefits are brought.

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