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BOLETIN AGUA
ARSÉNICO
TENDENCIAS TECNOLÓGICAS EN FUNCIÓN
DE PATENTES
UNIDAD TERRITORIAL DE VIGILANCIA
TECNOLÓGICA E INTELIGENCIA COMPETITIVA



IDITS

01/01/2015

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"Olvidamos que el ciclo del agua y el ciclo de la vida son uno mismo". Jacques Y. Cousteau.

El presente Boletín fue diagramado en el marco de la **Unidad Territorial de Vigilancia Tecnológica e Inteligencia Competitiva-MENDOZA**, desarrollada en el marco de la Carta Intención firmadas por el MINCyT y el IDITS en marzo 2013.

Este proyecto se materializó mediante la conformación de una Unidad conformada por trece instituciones del sector científico y académico y organismos públicos del estado provincial y nacional.

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

El presente boletín hace referencia a las tendencias más innovadoras en el tema **ARSENICO**, 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.

Fecha :13/12/2014

Patentes Arsénico

Fuente : Pubmed

Fecha : 26/11/2014

Evaluation of Ultrasound-Assisted in situ sorbent formation solid-phase extraction method for determination of Arsenic in water, food and biological samples.

Abstract A simple and rapid ultrasound-assisted in situ sorbent formation solid-phase extraction (UAISFSPE) coupled with electrothermal atomic absorption spectrometry detection (ET-AAS) was developed for preconcentration and determination of arsenic (As) in various samples. A small amount of cationic surfactant is dissolved in the aqueous sample containing As ions, which were complexed by ammonium pyrrolidinedithiocarbamate (APDC). After shaking, a little volume of hexafluorophosphate (NaPF₆) as an ion-pairing agent was added into the solution by a microsyringe. Due to the interaction between surfactant and ion-pairing agent, solid particles are formed and precipitate. The alkyl groups of the surfactant in the solid particles strongly interact with hydrophobic groups of analytes and become bound. Sonication aids the dispersion of the sorbent into the sample solution and mass transfer of the analyte into sorbent thus reducing extraction time. The solid particles are centrifuged, and the sedimented particles can be dissolved in an appropriate solvent to recover the absorbed analyte. After separation, total arsenic (As (III) and As (V)) was determined by ET-AAS. Several experimental parameters were investigated and optimized. A detection limit of 7 ng L⁻¹ with preconcentration factor of 100 and relative standard deviation for 10 replicate determinations of 0.1 µg L⁻¹ As (III) were 4.5 % achieved. Consequently, the method was applied to the determination of arsenic in certified reference materials, water, food and biological samples with satisfactory results.

Environ Technol. 2014 Nov 25:1-28. [Epub ahead of print] PMID:25420432 [PubMed - as supplied by publisher]

Autor/es Ezoddin M, Majdi B, Abdi K.

ver mas en : <http://www.ncbi.nlm.nih.gov/pubmed/25420432>

Fuente : Pubmed

Fecha : 25/11/2014

Opportunities for Phytoremediation and Bioindication of Arsenic Contaminated Water Using a Submerged Aquatic Plant: *Vallisneria natans* (Lour.) Hara.

The identification of plants with high arsenic hyperaccumulating efficiency from water is required to ensure the successful application of phytoremediation technology. Five dominant submerged plant species (*Vallisneria natans* (Lour.) Hara., *Potamogeton crispus* L., *Myriophyllum spicatum* L., *Ceratophyllum demersum* L. and *Hydrilla verticillata* (L.f.) Royle) in China were used to determine their potential to remove As from contaminated water. *V. natans* had the highest accumulation of As among them. The characteristics of As accumulation, transformation and the effect of phosphate on As accumulation in *V. natans* were then further studied. The growth of *V. natans* was not inhibited even when the As concentration reached 2.0 mg L⁻¹. After 21 d of As treatment, the bioconcentration factor (BCF) reached 1300. The As concentration in the environment and exposure time are major factors controlling the As concentration in *V. natans*. After being absorbed, As(V) is efficiently reduced to As(III) in plants. The synthesis of non-enzymic antioxidants may play an important role under As stress and increase As detoxication. In addition, As(V) uptake by *V. natans* was negatively correlated with phosphate (P) uptake when P was sufficiently supplied. As(V) is probably taken up via P transporters in *V. natans*.

Int J Phytoremediation. 2015;17(3):249-55. doi:

10.1080/15226514.2014.883496.PMID:25397983[PubMed - in process]

Autor/es Chen G, Liu X, Brookes PC, Xu J.

<http://www.ncbi.nlm.nih.gov/pubmed/25397983>

Fuente : Lilacs

Fecha : 25/11/2014

Predicting geogenic arsenic contamination in shallow groundwater of south Louisiana, United States.

ID: mdl-24779344

<http://pesquisa.bvsalud.org/portal/resource/es/mdl-24779344>

Fuente : Pubmed

Fecha :25/11/2014

Elevated lung cancer in younger adults and low concentrations of arsenic in water.

Arsenic concentrations greater than 100 µg/L in drinking water are a known cause of cancer, but the risks associated with lower concentrations are less well understood. The unusual geology and good information on past exposure found in northern Chile are key advantages for investigating the potential long-term effects of arsenic. We performed a case-control study of lung cancer from 2007 to 2010 in areas of northern Chile that had a wide range of arsenic concentrations in drinking water. Previously, we reported evidence of elevated cancer risks at arsenic concentrations greater than 100 µg/L. In the present study, we restricted analyses to the 92 cases and 288 population-based controls who were exposed to concentrations less than 100 µg/L. After adjustment for age, sex, and smoking behavior, these exposures from 40 or more years ago resulted in odds ratios for lung cancer of 1.00, 1.43 (90% confidence interval: 0.82, 2.52), and 2.01 (90% confidence interval: 1.14, 3.52) for increasing tertiles of arsenic exposure, respectively (P for trend = 0.02). Mean arsenic water concentrations in these tertiles were 6.5, 23.0, and 58.6 µg/L. For subjects younger than 65 years of age, the corresponding odds ratios were 1.00, 1.62 (90% confidence interval: 0.67, 3.90), and 3.41 (90% confidence interval: 1.51, 7.70). Adjustments for occupation, fruit and vegetable intake, and socioeconomic status had little impact on the results. These findings provide new evidence that arsenic water concentrations less than 100 µg/L are associated with higher risks of lung cancer. © The Author 2014. Published by Oxford University Press on behalf of the Johns Hopkins Bloomberg School of Public Health. All rights reserved. For permissions, please e-mail: journals.permissions@oup.com.

Am J Epidemiol. 2014 Dec 1;180(11):1082-7. doi: 10.1093/aje/kwu238. Epub 2014 Nov 4. PMID:25371173 [PubMed - in process]

Autor/es Steinmaus C, Ferreccio C, Yuan Y, Acevedo J, González F, Perez L, Cortés S, Balmes JR, Liaw J, Smit

<http://www.ncbi.nlm.nih.gov/pubmed/25371173>

Fuente : Google scholar

Fecha : 25/11/2014

Analysis of the risk of disease associated with arsenic exposure in water supply systems for human consumption

The risk of disease associated with arsenic exposure is analyzed in watersupply systems for human consumption, as well as the control of pollution and effects onhealth, in the community known as Barrio Hotel of Canas in comparison with the ...

http://inis.iaea.org/search/search.aspx?orig_q=RN:45095862

Fuente :Pubmed

Fecha : 25/11/2014

Arsenic: bioaccessibility from seaweed and rice, dietary exposure calculations and risk assessment.

Arsenic is a metalloid that occurs in food and the environment in different chemical forms. Inorganicarsenic is classified as a class I carcinogen. The inorganicarsenic intake from food anddrinking water varies depending on the geographicarsenic background. Non-dietary exposure toarsenic is likely to be of minor importance for the general population within the European Union. In Europe,arsenic indrinking water is on average low, but food products (e.g. rice and seaweed) are imported from all over the world including from regions with naturally higharsenic levels.

Therefore, specific populations living in Europe could also have a high exposure to inorganicarsenic due to their consumption pattern. Current risk assessment is based on exposure viadrinking water. For a good estimation of the risks ofarsenic in food, it is important to investigate if the bioavailability of inorganicarsenic from food is different fromdrinking water.

The present study further explores the issue of European dietary exposure to inorganicarsenic via rice and seaweed and its associated

health risks. The bioavailability of inorganic arsenic was measured in in vitro digestion experiments. The data indicate that the bioavailability of inorganic arsenic is similar for rice and seaweed compared with drinking water. The calculated dietary intake for specific European Union populations varied between 0.44 and 4.51 $\mu\text{g kg}^{-1} \text{bw day}^{-1}$. The margins of exposure between the inorganic intake levels and the BMDL0.5 values as derived by JECFA are low. Decreasing the intake of inorganic arsenic via Hijiki seaweed could be achieved by setting legal limits similar to those set for rice by the Codex Alimentarius Commission in July 2014.

Food Addit Contam Part A Chem Anal Control Expo Risk Assess. 2014 Nov 13;1-11. [Epub ahead of print] PMID:25393691 [PubMed - as supplied by publisher]

Autor/es Brandon EF, Janssen PJ, de Wit-Bos L.

<http://www.ncbi.nlm.nih.gov/pubmed/25393691>

Fuente : Pubmed

Fecha : 05/11/2014

The health effects of exposure to arsenic-contaminated drinking water: a review by global geographical distribution.

Chronic arsenic exposure through drinking water has been a vigorously studied and debated subject. However, the existing literature does not allow for a thorough examination of the potential regional discrepancies that may arise among arsenic-related health outcomes. The purpose of this article is to provide an updated review of the literature on arsenic exposure and commonly discussed health effects according to global geographical distribution. This geographically segmented approach helps uncover the discrepancies in the health effects of arsenic. For instance, women are more susceptible than men to a few types of cancer in Taiwan, but not in other countries. Although skin cancer and arsenic exposure correlations have been discovered in Chile, Argentina, the United States, and Taiwan, no evident association was found in mainland China. We then propose several globally applicable recommendations to prevent and treat the further spread of arsenic poisoning and suggestions of future study designs and

decision-making.

Int J Environ Health Res. 2014 Nov 3:1-21. [Epub ahead of print] PMID:25365079 [PubMed - as supplied by publisher]

Autor/es Huang L, Wu H, van der Kuijp TJ.

<http://www.ncbi.nlm.nih.gov/pubmed/25365079>

Fuente : Google scholar

Fecha :05/11/2014

Presencia natural de arsenico y su remoción en aguas de consumo, usando colectores solares en Cochabamba, Bolivia

Por defecto: PRESENCIA NATURAL DE ARSENICO Y SU REMOCIÓN EN AGUAS DE CONSUMO, USANDO COLECTORES SOLARES EN COCHABAMBA ... un alto riesgo de exposición de la población a elevados contenidos de arsénico presentes en el agua de consumo ...

http://webext.iingen.unam.mx/ocs-dirsas/index.php/bolivia_013/bolivia_013/paper/view/1037

Fuente : Google scholar

Fecha : 05/11/2014

Desarrollo de Biofiltros para la Recuperación de Cobre, Abatimiento de Arsenico y Tratamiento de Aguas Salinas

... Desarrollo de Biofiltros para la Recuperación de Cobre, Abatimiento de Arsenico y Tratamiento de Aguas Salinas. Mostrar el registro completo del ítem. Ficha descriptiva: Nombre Beneficiario: Corp Nacional del Cobre de Chile - Universidad de Santiago de Chile. ...

<http://repositoriodigital.corfo.cl/handle/11373/8691>

Fuente : Science Direct

Fecha :13/10/2014

The mechanistic basis of arsenicosis: Pathogenesis of skin cancer

Significant amounts of arsenic have been found in the groundwater of many countries including Argentina, Bangladesh, Chile, China, India, Mexico, and the United States with an estimated 200 million people at risk of toxic exposure. Although chronic arsenic poisoning damages many organ systems, it usually first presents in the skin with manifestations including hyperpigmentation, hyperkeratoses, Bowen's disease, squamous cell carcinoma, and basal cell carcinoma. Arsenic promotes oxidative stress by upregulating nicotinamide adenine dinucleotide phosphate oxidase, uncoupling nitric oxide synthase, and by depleting natural antioxidants such as nitric oxide and glutathione in addition to targeting other proteins responsible for the maintenance of redox homeostasis. It causes immune dysfunction and tissue inflammatory responses, which may involve activation of the unfolded protein response signaling pathway. In addition, the dysregulation of other molecular targets such as nuclear factor kappa B, Hippo signaling protein Yap, and the mineral dust-induced proto-oncogene may orchestrate the pathogenesis of arsenic-mediated health effects. The metalloid decreases expression of tumor suppressor molecules and increases expression of pro-inflammatory mitogen-activated protein kinase pathways leading to a tumor-promoting tissue microenvironment. Cooperation of upregulated signal transduction molecules with DNA damage may abrogate apoptosis, promote proliferation, and enhance cell survival. Genomic instability via direct DNA damage and weakening of several cellular DNA repair mechanisms could also be important cancer development mechanisms in arsenic-exposed populations. Thus, arsenic mediates its toxicity by generating oxidative stress, causing immune dysfunction, promoting genotoxicity, hampering DNA repair, and disrupting signal transduction, which may explain the complex disease manifestations seen in arsenicosis.

Cancer Letters, Volume 354, Issue 2, 28 November 2014, Pages 211-

<http://www.sciencedirect.com/science/article/pii/S0304383514004467>

Fuente : Science Direct

Fecha : 13/10/2014

Effects of polishing, cooking, and storing on total arsenic and arsenic species concentrations in rice cultivated in Japan

The effects of polishing, cooking, and storing on total arsenic (As) and As species concentrations in rice were studied adopting typical Japanese conditions. Total and inorganic As levels in three white rice samples polished by removing 10% of bran by weight were reduced to 61–66% and 51–70% of those in brown rice. The As levels in the white rice after three washings with deionized water were reduced to 81–84% and 71–83% of those in raw rice. Rinse-free rice, which requires no washing before cooking because bran remaining on the surface of the rice was removed previously, yielded an effect similar to that of reducing As in rice by washing. Low-volume cooking (water:rice 1.4–2.0:1) rice to dryness did not remove As. The As content of brown rice stored in grain form for one year was stable.

Food Chemistry, Volume 168, 1 February 2015, Pages 294–301

Autor/es Shigehiro Naito, Eri Matsumoto, Kumiko Shindoh, Tsutomu Nishimura

<http://www.sciencedirect.com/science/article/pii/S0308814614010930>

Fuente : Lilacs

Fecha : 11/10/2014

Review of coagulation technology for removal of arsenic: case of Chile.

ID: mdl-17366767

<http://pesquisa.bvsalud.org/portal/resource/es/mdl-17366767>

Fuente : Lilacs

Fecha : 11/10/2014

Spatial and temporal variations in arsenic exposure via drinking-water in northern Argentina.

ID: mdl-17366773

<http://pesquisa.bvsalud.org/portal/resource/es/mdl-17366773>

Fuente : Lilacs

Fecha : 11/10/2014

Increased childhood liver cancer mortality and arsenic in drinking water in northern Chile.

ID: mdl-18708388

<http://pesquisa.bvsalud.org/portal/resource/es/mdl-18708388>

Fuente : Lilacs

Fecha : 11/10/2014

[Health risk for the vulnerable population exposed to arsenic in the province of Buenos Aires, Argentina].

ID: mdl-22427158

<http://pesquisa.bvsalud.org/portal/resource/es/mdl-22427158>

Fuente : Lilacs

Fecha : 11/10/2014

Genome sequence of *Sphingomonas* sp. S17, isolated from an alkaline, hyperarsenic, and hypersaline volcano-associated lake at high altitude in the Argentinean Puna.

ID: mdl-21602338

<http://pesquisa.bvsalud.org/portal/resource/es/mdl-21602338>

Fuente : Science Direct

Fecha : 11/10/2014

Human health risk assessment with spatial analysis: Study of a population chronically exposed to arsenic through drinking water from Argentina

Arsenic (As) is a ubiquitous element widely distributed in the environment. This metalloid has proven carcinogenic action in man. The aim of this work was to assess the health risk related to As exposure through drinking water in an Argentinean population, applying spatial analytical techniques in addition to conventional approaches. The study involved 650 inhabitants from Chaco and Santiago del Estero provinces. Arsenic in drinking water (Asw) and urine (UAs) was measured by hydride generation atomic absorption spectrophotometry. Average daily dose (ADD), hazard quotient (HQ), and carcinogenic risk (CR) were estimated, geo-referenced and integrated with demographical data by a health composite index (HI) applying geographic information system (GIS) analysis. Asw covered a wide range of concentration: from non-detectable (ND) to 2000µg/L. More than 90% of the population was exposed to As, with UAs levels above the intervention level of 100µg/g creatinine. GIS analysis described an expected level of exposure lower than the observed, indicating possible additional source/s of exposure to inorganic arsenic. In 68% of the locations, the population had a HQ greater than 1, and the CR ranged between $5 \cdot 10^{-5}$ and $2,1 \cdot 10^{-2}$. An environmental exposure area through ADD geo-referencing defined a baseline scenario for space-time risk assessment. The time of residence, the

demographic density and the potential health considered outcomes helped characterize the health risk in the region. The geospatial analysis contributed to delimitate and analyze the change tendencies of risk in the region, broadening the scopes of the results for a decision-making process.

Science of The Total Environment, Volume 499, 15 November 2014, Pages 166-174
Autor/es J.A. Navoni, D. De Pietri, V. Olmos, C. Gimenez, G. Bovi Mitre, E. de Titto, E.C. Villaamil Lepori

<http://www.sciencedirect.com/science/article/pii/S0048969714012376>

Fuente : Lilacs

Fecha : 11/10/2014

Riesgo sanitario por sustancias tóxicas en aguas superficiales de Tres Arroyos, Argentina / Health risk by toxic substances in freshwater of Tres Arroyos, Argentina / Risco sanitário por substâncias tóxicas em águas superficiais de Tres Arroyos, Argentina

`/bases.bireme.br/iah/online/E/llxp_disclaimer.htm" title="LILACS-Express" class="fancybox_iframe">`
LILACS-Express

| ID: lil-633154

<http://pesquisa.bvsalud.org/portal/resource/es/lil-633154>

Fuente : Lilacs

Fecha : 11/10/2014

Rice consumption contributes to arsenic exposure in US women.

ID: mdl-22143778

<http://pesquisa.bvsalud.org/portal/resource/es/mdl-22143778>

Fuente : Lilacs

Fecha : 11/10/2014

Genetic polymorphisms influencing arsenic metabolism: evidence from Argentina.

ID: mdl-17450230

<http://pesquisa.bvsalud.org/portal/resource/es/mdl-17450230>

Fuente : lilacs

Fecha : 11/10/2014

Riesgo sanitario integrado por sustancias presentes en recursos hídricos de Tres Arroyos, Argentina / Integrated health risk by substances in water resources of Tres Arroyos, Argentina / Risco sanitário integrado por substâncias presentes em recursos hídricos de Tres Arroyos, Argentina

| ID: lil-708410

<http://pesquisa.bvsalud.org/portal/resource/es/lil-708410>

Fuente : epa

Fecha : 25/11/2014

Environmental Technology Verification Report Removal of...

... TDS reduction tests in NSF/ANSI58 - 2005, Reverse osmosis drinking water ...

to 200 gallons of base test water to create the challenge waters. ...

<http://nepis.epa.gov/Adobe/PDF/P1001Q4T.pdf>

Fuente : Epa

Fecha : 29/10/2014

Drinking Water Systems Center Verified Technologies | ETV...

The Drinking Water Systems Center has verified technologies in reducing biological contaminants, inorganic chemicals, particulates, arsenic, and disinfection-by-products.

<http://www.epa.gov/etv/vt-dws.html>

Fuente : Epa

Fecha : 17/10/2014

2011 Annual Report | Enabling Potable Reuse Of Wastewater...

... test for salt rejection and water permeability coefficient. The results are shown in Figure 10 and Table 1. Figure 10 ? Reverse osmosis data showing ...

http://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/display.abstractdetail/abstract/9457/report/2011

Fuente : Epa

Fecha : 17/10/2014

Arsenic and Antimony Removal from Drinking Water by Point...

EPA/600/R-11/026 March 2011 Arsenic and Antimony Removal from Drinking Water by Point-of-Entry Reverse Osmosis Coupled with Dual ...

<http://nepis.epa.gov/Adobe/PDF/P100AJGZ.pdf>

Fuente : Epo

Fecha : 10/07/2014

Cactus Mucilage and Ferric Ions for the Removal of Arsenate (As(V)) from Water

Potable drinking water is plagued with widespread arsenic contamination, particularly in developing communities. Ferric ions were introduced to interact with arsenate based on the strong affinity of arsenate for ferric hydroxides, followed by mucilage addition. The mucilage coagulated and flocculated the ferric-arsenate complex and formed visible flocs that settled at the bottom of the tubes. The system showed 75-96% arsenate removal in 1 hour, while longer retention times showed 100% removal. The role of the mucilage was demonstrated by untreated solutions showing no concentration difference and remaining stable for more than 15 days. This mucilage-based technology has the potential to be a relatively inexpensive, environmentally sustainable alternative to synthetic polymer flocculants for removing arsenic from drinking water.

http://worldwide.espacenet.com/publicationDetails/biblio?DB=worldwide.espacenet.com&II=4&ND=3&adjacent=true&locale=es_LP&FT=D&date=20130523&CC=US&NR=2014190898A1&KC=A1

Fuente : Epo

Fecha :16/04/2014

Combination electrode hydro-thermal synthesis method for removing arsenic in water based on electro-adsorption and arsenic removing method thereof

The invention provides a combination electrode hydro-thermal synthesis method for removing arsenic in water based on electro-adsorption. The combination electrode hydro-thermal synthesis method specifically comprises the following steps of: soaking active carbon fibers in dilute nitric acid or a sodium hydroxide solution for 1-24h for activation, and then washing with water next, putting the activated active carbon fibers in a high-temperature reaction kettle, adding 2mmol of manganese salt, 0.01-0.4mmol of iron salt, 1-4mmol of K₂S₂O₈, 2-8mL of concentrated sulfuric acid and 60-90mL of distilled water to the high-temperature reaction kettle per 1 gram, and mixing evenly and finally, sealing the high-temperature reaction kettle, reacting at a constant temperature ranging from 90 to 150 DEG C for 2-24h, cooling to the room temperature and then washing with distilled water, and drying in an oven. The method of preparing the combination electrode provided by the invention is simple and feasible, overcomes the shortcoming that the existing drinking water trace heavy metal element treatment technology is complex and has no choice, provides excellent technical guarantee for the body health of people and has good application value.

http://worldwide.espacenet.com/publicationDetails/biblio?DB=worldwide.espacenet.com&II=4&ND=3&adjacent=true&locale=es_LP&FT=D&date=20130523&CC=CN&NR=103723801A&KC=A

Fuente :Epo

Fecha : 12/02/2014

Arsenic removal modified active carbon and preparation method thereof

The invention discloses arsenic removal modified active carbon, which is

characterized by being prepared from the following raw materials in parts by weight: 5-8 parts of aluminum hydroxide, 120-130 parts of active carbon, 6-9 parts of polyethylene glycol, 3-4 parts of urea, 5-7 parts of calcium oxide, 7-9 parts of magnesium oxide, 10-15 parts of silicon dioxide, 8-10 parts of aluminum oxide, 10-15 parts of ferrous sulfate, 1-2 parts of ascorbic acid, 6-9 parts of sulfamic acid, 4-6 parts of sodium dodecyl benzene sulfonate, 4-5 parts of modified diatomite and a right amount of water. According to the invention, oxidized metals, such as calcium oxide, are used, and can remove sulfur efficiently meanwhile, sulfamic acid is used for activating the active carbon, thus, more micropores are formed and the specific area is larger by addition of ferrous sulfate, arsenic in water can be removed effectively, concentration of arsenic in water is reduced, and the arsenic concentration can meet the sanitary standard for drinking water. According to the invention, the technology is simple, the purification effect is remarkable, and the application foreground is substantial.

http://worldwide.espacenet.com/publicationDetails/biblio?DB=worldwide.espacenet.com&II=4&ND=3&adjacent=true&locale=es_LP&FT=D&date=20130523&CC=CN&NR=103566894A&KC=A

Fuente : Epo

Fecha : 05/02/2014

Integrated arsenic removal device for drinking water

The utility model discloses an integrated arsenic removal device for drinking water and belongs to the field of deep arsenic removal of drinking water. The integrated arsenic removal device comprises a water intake control system, a reactor and an ultrafiltration membrane filter system, and also a water yielding control system and an aerated oxidation system, wherein the water intake control system comprises a water lift pump, a first flowmeter, a constant-level water tank and a first valve the reactor further comprises a stirrer the ultrafiltration membrane filter system is located at the middle lower part of the reactor the water yielding control system comprises a vacuum meter, a third flowmeter, a third valve, a water suction pump, a fourth valve, a fifth valve, a buffer pipe and a vacuum pump the aerated oxidation system comprises an aerator pipe, a second flowmeter, a second valve and an air pump. The integrated arsenic removal device for drinking water has the characteristics that oxidization, adsorption and membrane separation are organically combined and completed in the same reaction tank, and a plurality of flowmeters and valves are additionally arranged so that the device is easier and more visual to operate,

so that the integrated arsenic removal device has the advantages of low fixed investment and low operating cost.

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Fuente : Epo

Fecha : 01/01/2014

Portable water purifier

The utility model discloses a portable water purifier which comprises a water purification device shell, an upper cover, a lower cover, a water inlet, a water outlet, a piston pressure part and a filtration part, wherein the upper cover is arranged on the upper part of the water purification device shell the lower cover is arranged on the lower part of the water purification device shell the water inlet is formed in the upper cover the water outlet is formed in the lower cover a unidirectional valve for allowing water flow to pass in a single direction is arranged at the lower end of the upper cover the filtration part is arranged in the water purification device shell a unidirectional valve for allowing the water flow to pass in the single direction is arranged on the piston. Compared with the prior art, the portable water purifier provided by the utility model has the advantages that the utility model provides an outdoor filter which is small in volume, portable, simple in structure and high in reliability and can perform emergency purification treatment on surface water, such as rain, snow, rivers and mountain springs. Meanwhile, the filter can filter out heavy metals such as lead, arsenic and mercury in water, remove harmful germs such as escherichia coli in the water and eliminate peculiar smell, so that the water can meet the national drinking water standard.

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Fuente : Epo

Fecha : 11/12/2013

Preparation method of biomass arsenic adsorbing material

The invention belongs to the field of water treatment material and relates to a preparation method of biomass arsenic adsorbing material. The preparation method provided by the invention is as follows: peanut vine containing protein is modified, and the specific process comprises peanut vine cleaning, smashing, saccharomycetes treatment, cyclodextrin composition and the like. The biomass arsenic adsorbing material prepared by the invention has the following advantages: (1), chemical treatment is not involved, and the manufacturing process is green and environment-friendly (2), the prepared biomass arsenic adsorbing material is purely natural and degradable (3), saccharomycetes and cyclodextrin are fully used for playing the effects of chelating and absorbing pentavalent arsenic ions, and the adsorbing capacity of the pentavalent arsenic ions is promoted to 156 mg/g, that is, each gram adsorbing material can absorb 156 mg pentavalent arsenic ions, which is 8.5 times of activated carbon. The biomass arsenic adsorbing material prepared by the invention can be used for treating waste water containing arsenic ions, can be used for a drinking water device, and has a wide market prospect.

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Fuente : Epo

Fecha : 05/12/2013

Process for the removal of arsenic and chromium from water

The present invention provides low cost and highly effective method for the removal of arsenic and Cr(III&VI) from contaminated water using zinc peroxide nanoparticles (20+-5 nm) capped with glycerol/PVP/TEA up to the permissible range of drinking water. As Arsenic and chromium occurs naturally in the earth's crust. When rocks, minerals, and soil erode, they release arsenic and chromium into groundwater. Arsenic and chromium occurs naturally in varying amounts in groundwater in various parts of country from ppb level to ppm level. The average concentration of arsenic and chromium as per USEPA standard in drinking water it is 10 parts per billion and 0.05 ppm (50 ppb) respectively. In drinking water the level of chromium is usually low as well, but contaminated water may contain the dangerous Cr(III&VI). Although Cr(III) is an essential

nutrient for humans and shortages may cause heart problems, disruptions of metabolisms and diabetes. But the uptake of too much Cr(III) can cause health effects as well, for instance skin rashes. Cr(VI) is known to cause various health effects Skin rashes, upset stomachs, respiratory problems, weakened immune systems, kidney and liver damage and lung cancer The persons who are drinking water having up to 50 ppb of arsenic and 0.05 ppm chromium over for many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer. Keeping the above facts we developed a cost effective nanoparticles for the removal of Arsenic and Cr(III&VI) from potable water up to potable range.

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date=20130523&CC=US&NR=2013324673A1&KC=A1](http://worldwide.espacenet.com/publicationDetails/biblio?DB=worldwide.espacenet.com&II=4&ND=3&adjacent=true&locale=es_LP&FT=D&date=20130523&CC=US&NR=2013324673A1&KC=A1)

Fuente : Epo

Fecha : 02/10/2013

Arsenic removal filter material, preparation method of arsenic removal filter material and application of arsenic removal filter material in drinking water purification

The invention relates to an arsenic removal filter material, a preparation method of the arsenic removal filter material, and an application of the arsenic removal filter material in drinking water purification. The filter material consists of a porous ceramic substrate, and nano zero-valent iron particles generated in the porous ceramic substrate in situ, wherein the micropore size of the porous ceramic substrate is 2-10 micrometers fleece-like undefined silicon-iron-carbon structures are formed in micropores, and can form an adsorption film after absorbing water and the porous ceramic substrate comprises the following materials in parts by weight: 50-55 parts of kieselguhr, 6-8 parts of bentonite, 3-4 parts of starch, 3-5 parts of kaoline, 1-2 parts of liquid wax, 1-3 parts of iron powder and 13-15 parts of powdered carbon. According to the filter material, a porous downy filter structure similar to a nose is formed in a microstructure, and the adsorption film is generated, the adsorption efficiency is improved greatly, and the filter material adapts to the hydrochemistry environment change. The used filter material does not fall or precipitate heavy metal, and is good in use safety.

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date=20130523&CC=CN&NR=103331143A&KC=A](http://worldwide.espacenet.com/publicationDetails/biblio?DB=worldwide.espacenet.com&II=4&ND=3&adjacent=true&locale=es_LP&FT=D&date=20130523&CC=CN&NR=103331143A&KC=A)

Fuente : Epo

Fecha : 06/02/2013

Rural integration household water purifier

The utility model relates to a rural integration household water purifier which is composed of a multi-medium adsorption module, a pure water preparation module, a water quality mineralizing module, a disinfection module, a high-pressure pump and the like. The multi-medium adsorption module is connected with an inlet of the high-pressure pump, the pure water preparation module is connected with the water quality mineralizing module which is connected with the disinfection module, and the multi-medium adsorption module utilizes activated carbon fiber made of coconut shells as adsorbing agents. The pure water preparation module utilizes an omexell reverse osmosis membrane which is low-pressure and resistant to population, and the water quality mineralizing module utilizes clean natural medical stones. The water purifier can effectively process high-fluorine water, arsenic-exceeding water, calcium-exceeding water, brackish water, microorganism-exceeding water, and nitrogen-exceeding and phosphorus-exceeding and heavy metal excessive and other harmful substance excessive water in rural water resources, and therefore resolves the problem of rural drinking water safety. Water which is processed achieves the national direct drinking water standard.

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Fuente : Epo

Fecha : 28/11/2012

Nano quantum force drinking water device and application

The invention discloses a nano quantum force drinking water device and application, and in particular relates to a drinking water device using a nano quantum force and application. The device has a special 'quantum force field

effect', and achieves the effects of improving water quality, reducing residual chlorine, chloroform and carcinogenic harmful substances such as arsenic, mercury, lead and chromium in water, enhancing the activity of water, activating cells, expelling toxin, detoxifying, enhancing human immunity, maintaining health and preventing diseases. The device is effective for a long term by one-time input. The device is technical breakthrough of the drinking water industry.

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date=20130523&CC=CN&NR=102795702A&KC=A](http://worldwide.espacenet.com/publicationDetails/biblio?DB=worldwide.espacenet.com&I=4&ND=3&adjacent=true&locale=es_LP&FT=D&date=20130523&CC=CN&NR=102795702A&KC=A)

Fuente : Epo

Fecha : 22/08/2012

Method for purifying drinking water using nanofilter coated with ultra-fine ferromagnetic ferrite, method for sterilizing harmful bacteria contained in drinking water using the nano filter and method for improving drinking water through removal and sterilization of harmful matter by using the nano filter

Provided is a method for purifying drinking water, which has a simple and low-cost configuration in which the magnetic line of force generated from the surface of a nanofilter formed by coating a nano-sized ferromagnetic ferrite on a non-woven fabric is used, and which reliably removes aggregates which were formed as harmful substances such as arsenic have aggregated on the iron in the drinking water. The method for purifying drinking water involves coating a filter material formed from a non-woven fabric with a nano-sized ferrite having a particle diameter of 5 to 30nm in order to form a nanofilter coated with the nano-sized ferromagnetic ferrite that emits a magnetic line of force from the surface of the filter material, soaking and leaving the nanofilter within drinking water for a predetermined period of time, and absorbing, with the nanofilter coated with the nano-sized ferromagnetic ferrite and by means of the action of the magnetic line of force thereof, aggregate substances included in which are a magnetic arsenic and a compound thereof which have aggregated on the iron in the drinking water, thereby purifying the drinking water.

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Fuente : Epo

Fecha : 07/10/2010

High efficiency ion exchange system for removing arsenic contaminants from water

The disclosed invention is a fixed bed ion exchange water purification system. It employs a combination of electronically controlled process steps and specific systems configurations to duplicate the effects of moving resin beds from one operating position to another as is required in moving bed ion exchange water purification systems. The invention combines features of single fixed bed ion exchange systems with those of a moving bed system. The invention applies to the treatment of water having typical industrial and drinking water concentrations of various ions.

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