Selective Recovery of Arsenic From Aqueous Solutions with Hydrated Titanium Dioxide.

s.n - Titanium Dioxide Patents and Patent Applications (Class 423/610)

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A Hybrid Sorbent Utilizing Nanoparticles of Hydrous Iron Oxide for Arsenic Removal from Drinking Water

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ABSTRACT

Arsenic in drinking water, present primarily as inorganic As(III) (arsenite) or As(V) (arsenate), has been linked to a number of human ailments. This has prompted the United States Environmental Protection Agency (USEPA) to lower the arsenic maximum contaminant level (MCL) from 50 to 10 μg/L (effective 2006). ArsenX[np] was investigated to satisfy the need for an efficient, reliable, and reusable material to meet this new arsenic standard. ArsenX[np] is a hybrid sorbent consisting of nanoparticles of hydrous iron oxide distributed throughout a porous polymeric bead. This combines the excellent handling, flow characteristics and attrition resistance of conventional ion exchange resins with the well-documented arsenic affinity of hydrous iron oxides. In field tests, the resin maintained an effluent arsenic concentration below 10 μg/L for 4 months of continuous operation with no mechanical problems and no pressure buildup across the resin bed. Arsenic is removed from solution due to the interaction with the nanoscale hydrous iron oxide surfaces rather than the anion exchange groups associated with the polymeric substrate, and the arsenic capacity is unaffected by common anions such as sulfate, chloride, or bicarbonate.

Key words: arsenic; ArsenX[np]; nanoparticles; drinking water; sorbent; hydrous iron oxide; hybrid

INTRODUCTION

Arsenic is a widely distributed element within the earth's crust, with an average abundance of approximately 2 mg per kg, and may occur in drinking water due to contact with arsenic-rich sediments and rocks (Greenwood and Earnshaw, 1984). The consumption of drinking water containing even low levels of arsenic over long periods of time has been shown to be deleterious to human health. A range of diseases have been linked

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Description: -
-Selective Recovery of Arsenic From Aqueous Solutions with Hydrated Titanium Dioxide.
-
Information circular (United States. Bureau of Mines) -- 7914
Information circular (United States. Bureau of Mines) -- 6346
Report of investigations (United States. Bureau of Mines) -- 8756Selective Recovery of Arsenic From Aqueous Solutions with Hydrated Titanium Dioxide.
Notes: 1
This edition was published in 1982

Tags: #US8454816B1

Composition for removing arsenic from aqueous streams

ASSIGNMENT OF ASSIGNORS INTEREST SEE DOCUMENT FOR DETAILS. Influence of surface chemistry of activated carbon electrodes on electro-assisted adsorption of arsenate.

Magnetic materials and magnetic separation of dyes from aqueous solutions: a review

The process of claim 3 further comprising the steps of: concentrating said lithium chloride in said brine solution using said continuous countercurrent adsorption and desorption circuit to form said enhanced lithium product stream, and then, selectively converting said lithium chloride in said enhanced lithium product stream to lithium carbonate, lithium hydroxide, or both. When the cerium +4 compound and precipitating agent are present in the oxidation zone as a fixed bed, it is normally preferred that the particles be spherical in shape so the flow of the aqueous feed through the bed is evenly distributed. Similar to the embodiment illustrated in FIG.

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The efficiency of the electrodialytic water-splitting process can be measured by molds of acid, HF, produced per Faraday of current passed. Advanced Research in Nanosciences for Water Technology.

Adsorption of Pb(II) from an Aqueous Solution by Titanium Dioxide/Carbon Nanotube Nanocomposites: Kinetics, Thermodynamics, and Isotherms

The CCAD circuit 400, after achieving steady state operation, provided excellent results for lithium recovery. Australian Journal of Engineering and Innovative Technology 2020,,, 42-53.

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Simultaneously removal of inorganic arsenic species from stored rainwater in arsenic endemic area by leaves of Tecomella undulata: a multivariate

study.

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Developing new adsorptive membrane by modification of support layer with iron oxide microspheres for arsenic removal. Inorganic Chemistry Communications 2019, 108 , 107508. In the oxidation vessel the aqueous feed is contacted with a compound containing cerium in the +4 oxidation state hereinafter referred to as cerium, +4 , which Ce +4 is an extremely strong oxidizing agent and oxidizes any arsenite or other arsenic present in the +3 oxidation state to arsenate or other species containing arsenic in the +5 oxidation state.

Nanoconfined hydrous titanium oxides with excellent acid stability for selective and efficient removal of As(V) from acidic wastewater

Arsenic concentrations in wastewaters, groundwaters, surface waters and geothermal waters frequently exceed this level. Hassan NM, Adu-Wusu K, Marra JC 2004 Resorcinol-formaldehyde adsorption of cesium from Hanford waste solutions Part I.

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Dang, Decomplexation efficiency and mechanism of Cu II —EDTA by H 2O 2 coupled internal micro-electrolysis process, Environ. Any remaining organic materials can be removed with a mixed bed GMF that includes activated carbon as part of the mixed bed.

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