A High Capacity Reusable Cationic Material [Ag-Bipy+] [No3] For The Removal Of Perchlorate From Water

Tech ID: 32827 / UC Case 2015-528-0

BACKGROUND

Perchlorate is a chemical usually produced commercially that is soluble in water, can easily travel through aqueous systems, and can persist for decades in groundwater. Even in trace amounts, perchlorate can disrupt thyroid hormone production, which can have harmful side effects. These particular characteristics have made contamination of ground water by perchlorate a major widespread issue, and its decontamination a major challenge. Currently available techniques for removing perchlorate include high pressure water washout and single-use resins for capturing perchlorate.

TECHNOLOGY DESCRIPTION

Researchers at the University of California, Santa Cruz have designed a solid-state system that can remediate perchlorate pollution. The system involves passing contaminated water over a metal-organic framework material - in particular, (silver 4,4'-bipyridine nitrate). The material specifically binds perchlorate without leaching any other material into the water. The perchlorate can be removed from the material, thereby recharging it for multiple cycles of use.

The invention also includes a new form of silver 4,4'-bipyridine nitrate that is synthesized at room temperature, rather than hydrothermically. This new material has superior binding properties for perchlorate than previous forms.

APPLICATIONS

- Perchlorate remediation
- Groundwater cleanup

ADVANTAGES

- Specific for perchlorate
- Efficient
- Rechargeable

INTELLECTUAL PROPERTY INFORMATION

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,649,177	05/16/2023	2015-528
United States Of America	Issued Patent	11,155,476	10/26/2021	2015-528
United States Of America	Issued Patent	10,597,312	03/24/2020	2015-528

CONTACT

Jeff M. Jackson
jjackso6@ucsc.edu
tel: .

INVENTORS

- Colinas, Ian
- Oliver, Scott

OTHER INFORMATION

KEYWORDS

Water cleanup, Perchlorate removal, Metal-organic framework

CATEGORIZED AS

- **Environment**
  - Remediation

RELATED CASES

2015-528-0

RELATED MATERIALS

- Anion exchange dynamics in the capture of perchlorate by a cationic Ag-based MOF - 04/28/2017

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Producing aluminum oxide (alumina) from reaction of a gallium/aluminum alloy with water
- Biodiesel Made Easy

University of California, Santa Cruz
Industry Alliances & Technology Commercialization
Kerr 413 / IATC,
Santa Cruz,CA 95064

Tel: 831.459.5415
innovation@ucsc.edu
officeofresearch.ucsc.edu/
Fax: 831.459.1658

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