

CationGuard: High-Efficiency Removal for Ultra-Pure Liquid Streams

Novel chemical compound with a unique ligand structure for efficient removal of cations in industrial settings, aiming to protect equipment and meet stringent environmental standards.

Case ID:

ID2018-10 (SJSU) - KD107360-01-01 (EPRI)

IP Position:

US Patent [10773253B2](#), PCT [WO2020021327](#)

Development Status:

TRL 8: System complete and qualified.

Opportunity

Partners sought for licensing technology.

Category(s):

Industrial Processes, Chemical Engineering, Materials Science, Industrial Liquid Streams

Keywords:

Cation Removal, Ultra-Low Cation Concentrations, Equilibrium Leakage Prevention, Power Generation, Lead and Mercury Removal

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1.0

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Technology Overview

Certain cations, such as lead and mercury, are identified as contaminants that can contribute to stress corrosion cracking of materials, impacting the integrity of equipment, and can have environmental and health implications. Existing methods, such as ion exchange, face challenges in achieving ultra-low cation concentrations in industrial liquid streams.

This invention introduces a chemical compound with a unique ligand structure for efficient removal of cations from industrial liquid streams, offering advantages in terms of high uptake capacity, achieving ultra-low concentrations, and preventing equilibrium leakage.

Overall, this technology describes a novel chemical compound and method for efficiently removing cations from liquid streams, addressing limitations associated with existing techniques and offering a versatile solution for diverse industrial applications.

Key Features & Benefits

- **Unique Ligand Structure (R1-SO₂-S-R2-SH):** Designed for efficient complexation of cations, forming stable ring-like geometries.
- **High Uptake Capacity:** Provides high uptake capacity for cations, allowing for the reduction of cation concentration in liquid streams to ultra-low levels, below part per billion.
- **Minimized Equilibrium Leakage:** Addresses current limitations by minimizing or eliminating equilibrium leakage, ensuring stability in achieving and maintaining low cation concentrations.
- **Equipment Protection:** Mitigates stress corrosion cracking in materials by effectively removing cationic contaminants from liquid streams.

Potential Applications

- Versatile applications, ranging from enhancing power generation equipment integrity and metal processing ensuring compliance with strict environmental regulations in nuclear and fossil fuel power plants. Adaptable to diverse sectors, including healthcare, research labs, chemical manufacturing, water treatment and environmental cleanup.

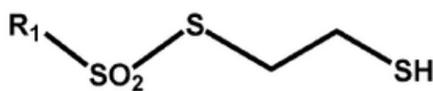


Fig 1.

Illustrates one chemical compound for use in removing a cation from a liquid

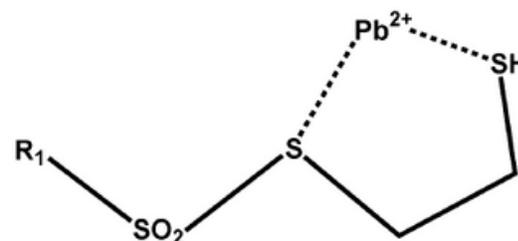


Fig 2.

Illustrates the chemical compound of Fig. 1 interacting with cationic lead cation