

TechBriefs

Savannah River National Laboratory

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At a glance

- > Non toxic to biological organisms
- > Potential capacity to decontaminate biological environments
- > Potential use for therapeutical metals delivery
- > U. S. Patent 8,771,750

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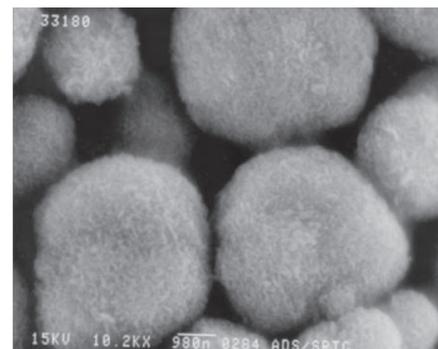


Delivery or removal of metals from biological systems

This technology could be used to deliver therapeutic doses of metal ions to diseased organs in humans and animals and also to remove elevated levels of accumulated metals in affected organs.

Background

A number of metals are used as therapeutic agents in treating diseases. These metals are often introduced as metal complexes featuring organic ligands. The organic complexes are utilized to increase solubility at physiological pH and allow transport into the blood stream and deliver to the affected organ. Often large quantities of the metal complex are injected to provide sufficient amount of metal for therapeutic effect. Regulation of metal levels can be problematic and result in toxic reactions if metal ions accumulate and high concentrations occur. Accumulated metal ions can prove difficult to remove from the affected organ due to low solubility at the physiological pH.



SEM image of monosodium titanate (MST)

How it works

This invention provides an alternate method of metal ion delivery and/or removal using an inert, inorganic substance, monosodium titanate (MST). For drug delivery, the metal of interest would be loaded onto the MST and injected into the patient. Metal-loaded MST would then release the metal into the affected organ. For metal removal, one would inject the MST into the blood stream and/or affected organ, and MST would sorb the excess amount of metal and the metal-loaded would be removed by natural pathways.

Potential uses

This technology would have commercial potential to the medical and pharmaceutical industry. A patent has been issued by the U. S. Patent and Trademark Office.

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Technology transfer

The Savannah River National Laboratory (SRNL) is the U.S. Department of Energy's (DOE) applied research and development laboratory at the Savannah River Site (SRS).

With its wide spectrum of expertise in areas such as homeland security, hydrogen technology, materials, sensors, and environmental science, SRNL's cutting edge technology delivers high dividends to its customers.

The management and operating contractor for SRS and SRNL is Savannah River Nuclear Solutions, LLC. SRNS is responsible for transferring its technologies to the private sector so that these technologies may have the collateral benefit of enhancing U.S. economic competitiveness.

Partnering opportunities

SRNS invites interested companies with proven capabilities in this area of expertise to develop commercial applications for this process under a cooperative research and development agreement (CRADA) or licensing agreement. Interested companies will be requested to submit a business plan setting forth company qualifications, strategies, activities, and milestones for commercializing this invention. Qualifications should include past experience at bringing similar products to market, reasonable schedule for product launch, sufficient manufacturing capacity, established distribution networks, and evidence of sufficient financial resources for product development and launch.

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