TECHNOLOGY

Material to Cheaply and Effectively Extract Uranium from Seawater

OVERVIEW

Background
The world's oceans hold 1000 times more uranium than conventional ores. Unlike conventional mining, retrieving uranium from seawater requires no mechanical systems and has virtually no environmental impact. The feasibility of utilizing adsorbent fabrics for uranium extraction has already been proven by an extensive research effort in Japan. However, the costs of this current seawater extraction method prevent this method from displacing the more environmentally hazardous open-pit (conventional) mining techniques.

Innovative Technology
Researchers from the University of Maryland, working in conjunction with the Catholic University of America and the University of Notre Dame, have discovered major breakthroughs that make the extraction of uranium from seawater more cost effective. Utilizing a braided substrate fabric with high surface area, we have developed a process of irradiating this fabric with organic phosphorus compounds which have a high adsorption rate for uranium. Additionally, they have been successful in increasing the extraction efficiency (up to 99.7 %), making the material fabrication and elution process simpler, and improving upon the reusability of the product. With adoption of this technology, the future of green nuclear energy will be even greener.

Applications:
· Extraction of uranium from seawater or other solutions.
· Remediation of uranium-polluted waters and soils.

Advantages:
· Braided substrate combines mechanical strength and durability with high surface area for increased adsorption.
· Fabric can be easily eluted and reused numerous times.
· Removal of up to 99.7 % of uranium solution from real seawater.
· System is highly selective for uranium ions.
· Highly cost effective compared to previous adsorption techniques.

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Additional Information

INSTITUTION

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PATENT STATUS

Patent(s) pending

LICENSE STATUS

Available for exclusive license

CATEGORIES

- Chemical
- Materials

EXTERNAL RESOURCES

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