

# TechBriefs

## Savannah River National Laboratory

U.S. DEPARTMENT OF ENERGY • SAVANNAH RIVER SITE • AIKEN • SC

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### Benefits

- > Reduced capital and operating costs
- Straightforward removal of
- > tritium gas from lithium metal blankets
- > No need for pre-electrolysis separation methods

### Applications

- > Lithium metal blanket recycling
- > Tritium production
- > Environmental remediation of lithium cooled reactor blankets

### Contact Information

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## Recovery of Tritium from a Molten Lithium Blanket

### Technology Overview

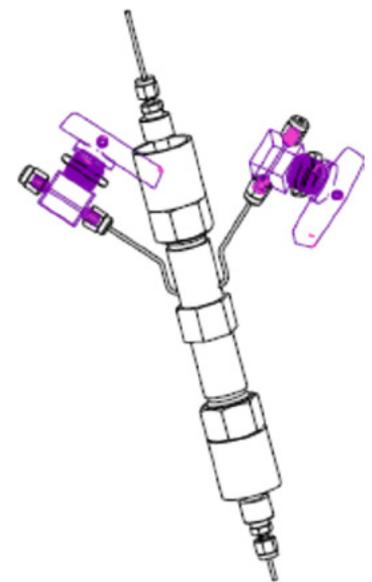
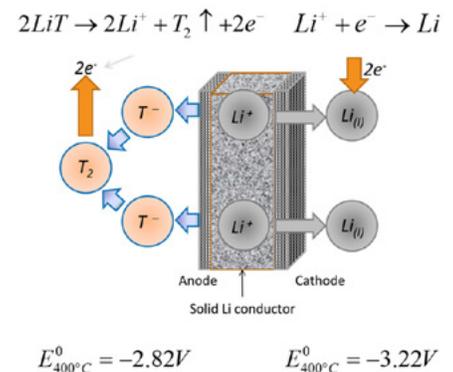
Savannah River National Laboratory (SRNL) has developed electrochemical cells and methods for the recovery of tritium from a molten lithium solution without the need for a separation or concentration step.

### Description

The lithium blankets surrounding the core of neutron generating devices, such as fusion and advanced fission reactors, can advantageously be used for both heat transfer and the production of tritium. Tritium is useful in applications such as lighting and weapons production. It is also the primary fuel source for fusion reactors. A method has been developed for the safe and effective recovery of tritium from a molten lithium blanket that offers reduced capital and operating costs and is more straight forward than previously known methods. In this novel process, the molten lithium can function as a second electrode and form lithium ions and tritium gas when a voltage is applied. The method and system can also be utilized to convert LiT to lithium metal that can be recycled back to the blanket.

### Intellectual Property

This technology and methods for its use have been granted U.S. Patent No. 10,450,660 B2 (October 22, 2019), "Recovery of Tritium from a Molten Lithium Blanket" and is available for licensing.



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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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