HIGH POWERED TARGET DESIGNS FOR NEUTRON-DRIVEN ISOTOPE PRODUCTION

Tech ID: 32928 / UC Case 2023-018-0

BRIEF DESCRIPTION

The invention involves a target assembly designed to produce a neutron flux with sufficient flux and energy distribution. This is achieved through accelerator-driven thick target deuteron breakup. The assembly includes a low-Z deuteron breakup target and a supporting structure where the target is located. The deuteron breakup target can be made from materials such as graphite, metallic beryllium, a beryllium-water combination, or liquid lithium. The supporting structure is constructed from materials with high thermal conductivity to manage the high heat flux generated at the target location. This invention represents a significant advancement in neutron target technology, offering versatile applications and improved performance in isotope production and neutron-based research.

ADVANTAGES

- High Neutron Flux: The design ensures a high neutron flux, which is essential for efficient isotope production and other applications requiring intense neutron sources.
- Material Versatility: The ability to use different materials for the deuteron breakup target allows for optimization based on specific requirements and availability.
- Thermal Management: The supporting structure's high thermal conductivity effectively manages the heat generated, ensuring the stability and longevity of the target assembly.
- Accelerator-Driven: Utilizing an accelerator-driven approach provides precise control over the neutron flux and energy distribution, enhancing the efficiency and effectiveness of the target assembly.

SUGGESTED USES

- Isotope Production: The primary application of this invention is in the production of isotopes for medical, industrial, and research purposes. The neutron flux generated can be used to produce various isotopes through neutron capture processes.
- Neutron Source for Research: The target assembly can serve as a neutron source for scientific research, including studies in nuclear physics and materials science.
- Radiation Therapy: The neutron flux can be utilized in radiation therapy for cancer treatment, providing an alternative to traditional radiation sources.

PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Reference for National Filings	WO 2024/054607	03/14/2024	2023-018

Patent Pending

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Simultaneous 225Ac & 18F Production with Standard Medical Cyclotrons
- Bent Crystal Spectrometer For Pebble Bed Reactor Burnup Measurement

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OTHER INFORMATION

CATEGORIZED AS

» **Energy**

» Other

» **Medical**

» Therapeutics

» **Research Tools**

» Other

RELATED CASES

2023-018-0

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