Neodymium Oxide Synthesis and Americium Oxide Production via Internal Gelation

Tech ID: 33837 / UC Case 2024-939-0

BRIEF DESCRIPTION

A novel technique for the safe and efficient production of neodymium oxide microspheres, serving as a non-radioactive surrogate for americium oxide synthesis.

FULL DESCRIPTION

This technology introduces a safer, dust-free method for synthesizing neodymium oxide microspheres through an internal gelation process, utilizing neodymium as a non-radioactive surrogate for americium. This approach is particularly advantageous for applications requiring high purity and specific microstructural properties without the risk of airborne particulate contamination. The same technique could be used to produce americium oxide.

SUGGESTED USES

- Advanced fuel cycles for nuclear reactors, utilizing mixed oxide fuels.
- Partitioning and transmutation efforts in nuclear waste management.
- Radioisotope power systems (RPSs) for long-duration energy supply in remote or harsh environments.
- Photonics, catalysis, and surface coatings where neodymium oxide is beneficial.

ADVANTAGES

- Minimizes dust formation and airborne contamination risks, crucial for handling highly active materials.
- Produces high-purity neodymium oxide microspheres with tunable microstructural properties.
- Offers a safer, more efficient alternative to conventional synthesis methods such as precipitation and hydrothermal techniques.
- Applicable to a wide range of metals beyond neodymium, including those used in advanced nuclear technologies.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

CATEGORIZED AS

- **Materials & Chemicals**
  - Other
  - Polymers

RELATED CASES

2024-939-0

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