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# Towards mitigation of challenges in development of high power ISOL targets

*Thursday, 23 May 2024 16:00 (2 hours)*

Worldwide Isotope Separation On-Line (ISOL) facilities face growing demand for producing and extracting high-purity exotic radioactive ion beams to serve nuclear physics, astrophysics and medical applications. In this technique, a particle beam interacts with a suitable target material to produce the desired isotopes through a combination of mechanisms like spallation, fragmentation and fission. TRIUMF has the world's highest-power ISOL facility—ISAC, handling 50 kW of proton beam power. The formidable challenge is to suitably handle the power deposited within the target material and maintain it at 2000℃ to optimize the diffusion and effusion of the radioactive products. The intricacy of this design requires precise knowledge of the thermal properties of the target material. Typically, a blend of metallic carbide and graphite, these targets exhibit varying porosity and morphology and have effective thermal properties differing from individual constituent elements. To investigate these properties, a combined numerical-experimental approach is employed. This contribution discusses the optimization of target material sample size using numerical tools and outlines the exploration of thermal properties using an experimental apparatus, the Chamber for Heating Investigations (CHI), developed at TRIUMF.

## Footnotes

## Funding Agency

## Paper preparation format

## Region represented

North America

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