

Innovative Purification Techniques for Producing High-Quality Germanium Detectors for Low-Mass Dark Matter Searches

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Achieving detector-grade germanium crystals necessitates employing advanced purification methods to eliminate impurities from standard-grade materials. At the University of South Dakota, we specialize in a meticulous zone refining process tailored to ensure exceptional purity and quality. In this presentation, we delve into the nuances of semiconductor types and provide an overview of how specific impurities and doping influence semiconductor properties. Moreover, we offer insights into our laboratory's purification procedure, emphasizing our commitment to achieving consistent and high-quality results. Additionally, we discuss the preparatory steps preceding zone refining and detail our post-refinement analysis methods to validate the efficacy of our purification process. Join us as we explore the intricacies of advanced purification techniques vital for producing germanium detectors optimized for low-mass dark matter detection.

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