

## Radiopurity measurement of acrylic for DEAP-3600

*Thursday, 11 April 2013 15:00 (1h 20m)*

The spherical acrylic vessel that contains the liquid argon target is the most critical component in the DEAP-3600 dark matter experiment. Alpha decays near the inner surface of the acrylic vessel are one of the main sources of background in the detector. A fraction of the alpha energy, or the recoiling nucleus from the alpha decay, could misreconstruct in the fiducial volume and result in a false candidate dark matter event.

Acrylic has some inherent contamination, including U-238 and Th-232. Another background of particular concern is diffusion of Rn-222 during manufacturing. The maximum acceptable concentrations in the DEAP-3600 acrylic vessel are ppt levels of U-238, Th-232, and  $10^{-8}$  ppt of Pb-210. The impurities in the bulk acrylic will be measured by vaporizing a large quantity of acrylic and counting the concentrated residue with an ultra-low background HPGe well detector and a low background alpha spectrometer.

First results from the acrylic assay system at SNOLAB will be presented.

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