

SNO+ Transfer Station

Tuesday, August 20, 2024 9:55 AM (10 minutes)

The next crucial phase for the SNO+ experiment is addition of Te into the Acrylic Vessel(AV) to begin the search for Neutrino-less double beta decay. The Tellurium (Te) is dissolved in the liquid scintillator (LAB) with the help of Butanediol(BD) and DDA. The DDA once purified on the surface in the DDA still, will be transported underground and loaded into the TeA-Diol plant via the DDA transfer station for mixing with BD, LAB and TeA, and subsequently into the AV. Similarly, butanediol will be purified in the scintillator plant after being loaded through the BD Transfer Station, before being introduced into the AV. Both Transfer Stations will need to adhere to the strict cleanliness protocols/standards of SNO+. This requires cleaning of the parts prior to operation. The cleaning of the parts is a crucial step for SNO+ to avoid introducing additional background to the detector. The cleaning and installation plans are underway and will take place in the upcoming fall.

The cleaning process involves using 1% Nitric acid where small parts are acid leached using acid baths and bigger parts/setups cleaned by acid run through it. Initial cleaning will occur at the surface lab, followed by further cleaning stages at the BD and DDA transfer stations underground.

The Quality Assurance (QA) is currently being developed to determine the cleanliness at different stages of cleaning steps during the construction phase of the transfer station. The QA will be assessing the quality of the acid and detect contaminants from parts leaching. This will be determined with the help of UV-Vis absorption spectroscopy and ICPMS analysis.

This talk will present the details of the BD and DDA Transfer stations and the importance to SNO+ experiment, outlining the cleaning methodologies and QA analysis, which are essential for maintaining low background during commissioning and operation.

What area of study best describes your talk?

Physics

If you answered 'Other', please provide the study area.

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Session Classification: Presentations