

Organic Scintillator and Tellurium Purification Techniques of the SNO+ Double Beta Decay Experiment

Friday, 26 May 2017 16:30 (0:20)

Content

SNO+ will be a successor to the Sudbury Neutrino Observatory (SNO) that will be filled with an organic liquid scintillator and optimized to maximize its sensitivity to neutrinoless double beta (NLDBD). The project will be executed in three phases; In the first phase, that is currently approaching completion, the detector will be filled with light water, that would then be displaced by 780 metric tonnes of purified Linear Alkylbenzene (LAB) into phase two. After evaluation of internal backgrounds, the LAB scintillator will be recirculated and loaded with an organometallic form of a tellurium complex that will initiate phase three and the NLDBD physics mode. The entire operation is anticipated to complete by the end of 2018. In this talk, I will introduce the three main ingredients of the liquid scintillator: the LAB, the telluric acid and the diol used in the complex synthesis process, along with their purification techniques that have been developed by the SNO+ collaboration. I will conclude by presenting the performance of the achieved scintillator cocktail and the NLDBD sensitivity of the SNO+ experiment.

Summary

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Session Classification : Session 8