Abstract:

Polarized targets are produced at Slifer Lab as part of the UNH NPG research program. The goal is to produce polarized targets with a Dynamic Nuclear Polarizer (DNP) that is used in the spin-dependent physics program at Jefferson Lab. Ammonia that has free radicals by irradiation and is polarized by Dynamic Nuclear Polarization is a common polarized target. A new method for solidifying ammonia was implemented with the intent of producing higher density solid ammonia. This method utilized a solid copper rod mounted to the bottom of the solidification chamber that pulled heat from the chamber and sank it in a bath of liquid nitrogen. This allowed for the chamber walls to get to a temperature that was closer to the freezing point of ammonia and allowed it to solidify in a slower manner and increased the density. The measurement of the density of the slowly frozen ammonia is in progress but qualitative analysis supports the material will have a higher density.