

Environmental Effects on TPB Wavelength Shifting Coatings

The future neutrino detector MicroBooNE at Fermilab will rely on liquid argon scintillation of wavelength 128 nm for the trigger, as well as for determining the time and location of neutrino events. To better detect this light, we use tetraphenyl butadiene (TPB) embedded in polystyrene which shifts the light to a peak wavelength of 425 nm. Although we would like to store TPB for several weeks at a time, we have observed that they degrade significantly after only one day. We examined environmental effects on TPB degradation by tracking the performance of several plates placed in different conditions with varying light exposure and humidity levels. Several preventative measures were also evaluated; the results of each study and recommendations for proper TPB storage are presented.

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