

CRL Acrylic Radioactivity Report for Nov.
Summarized by Earle

Abstract:

Levels of Th in the several rope samples checked are higher than we would like for vessel support. New measurements on the monomer increase our confidence that clean acrylic raw materials can be obtained for SNO. Intersite comparisons of results suggest inconsistencies which have not been resolved.

Details:

a) Spiked samples from LANL have been vaporized and the Th content measured by TIMS. LANL claims that the spike was 134 ppt and they measured 134 +/- 2 ppt by NAA. We have measured 104 & 112 ppt (suggesting about 80% recovery). We plan to increase the data set.

b) Last month we reported that the vaporization and TIMS gave 380 ppt Th for kevlar rope (cf 360 +/- 200 from Guelph). We have now measured 880 ppt for the spectra rope (cf 250 +/- 100 from Guelph). We must try to get better rope.

c) The data set on NAA on monomer has been increased. Three more samples have been measured for Th. Truck < 1.5 ppt, UG tank 3 +/- 0.7 ppt and mixing room 7 +/- 1.5 ppt. The mixing room sample also showed significant levels of Cr, Zn and Fe.

d) Irradiated acrylic from Guelph, shaped as 400 g Marinelli beakers, have been vaporized and the residue both gamma counted (two samples) and TIMS (four samples).

| Guelph ID | Guelph Th ppt (gammas) | CRL Th gammas | CRL Th mass spec. | CRL U mass spec. |
|-----------|------------------------|---------------|-------------------|------------------|
| J03 | approx 4.5 +/- 1.8 | | 5.6 | 3.8 |
| J04 | approx 4.5 +/- 1.8 | | 7.8 | 8.6 |
| J11 | < 1.4 | 1.6 +/- 0.3 | 5.6 | 3.4 |
| J12 | 4.3 +/- 4.0 | < 0.6 | 5.3 | 1.8 |

This material is the Polycast candle which last month was reported by CRL to be around 20 ppt by both NAA and TIMS. The surface to volume ratio is probably lower for the Marinelli beakers than for the CRL material which might explain the 20 ppt as compared to 5 ppt. The differences between the TIMS and NAA numbers are disconcerting. The NAA values depend on the correctness of the Al monitor (the monitor is required for both the Guelph and CRL gamma results) which is being examined at Guelph and at CRL.