

Th concentration in various acrylic samples..

Davis Earle

Mar, 1995

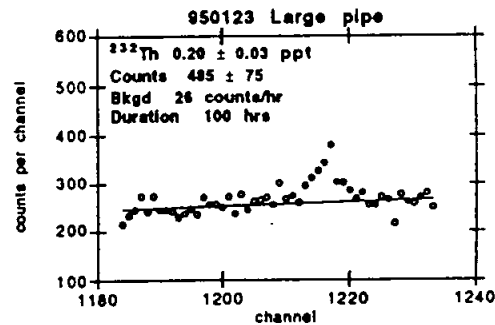
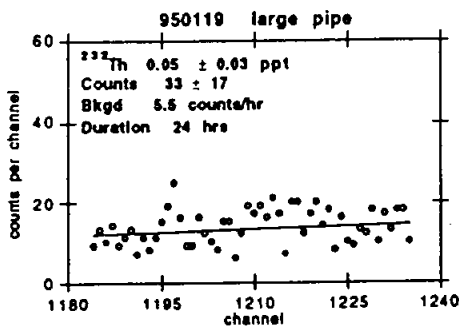
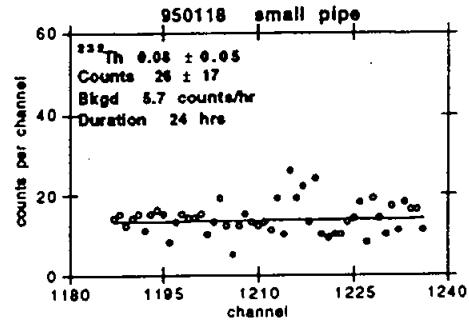
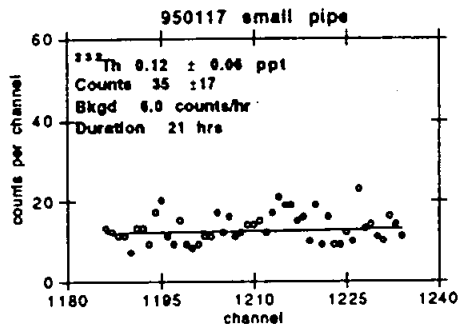
SNO-STR-95-11

- 1) Concentration of Th in acrylic tubing

- 2) Th concentration in polished acrylic.

- 3) Th content of attachment acrylic.

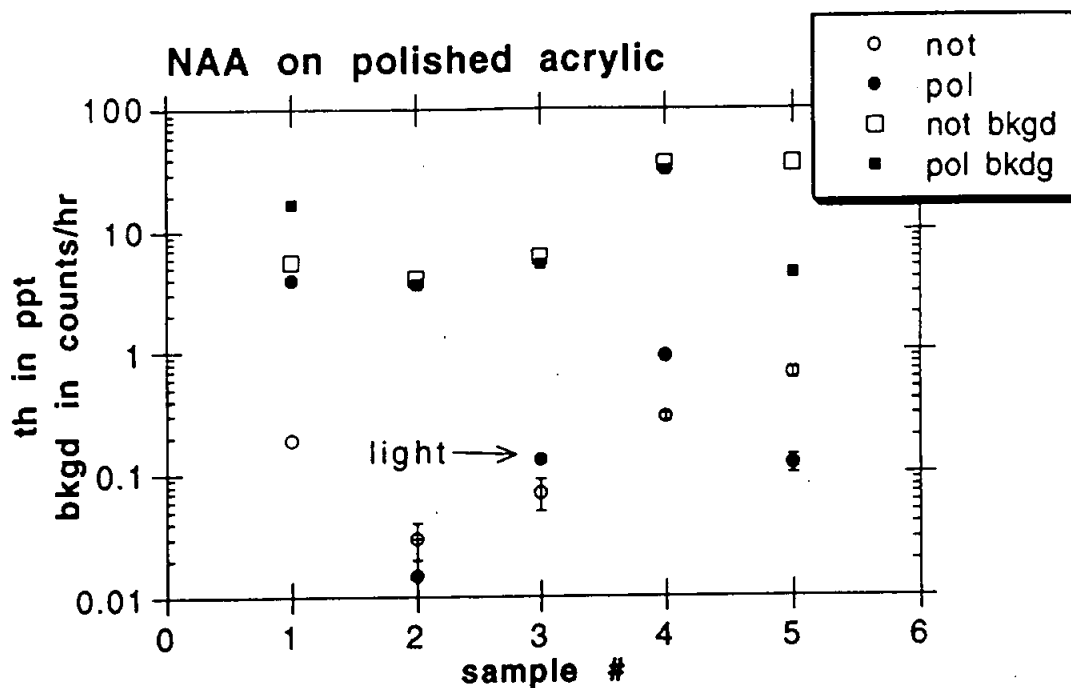
Concentration of Th in acrylic tubing Feb 3, 1995



Here are the results on Th in the large and small diameter pipes from NAA analysis. As you can see the Th varies from 0.05 to 0.2 ppt. There was no evidence of U in these samples. These values are well below the SNO specifications and, if we can generalize from only four samples, we can conclude that the piping is acceptable from a Th point of view.

I note that Henry has tested the Rn emanation from Nagene 290 flexible tubing and is about to test some softer silicone tubing for the calibration sources. I continue to be concerned about the brittle nature of the acrylic tubing and wonder if flexible tubing might not be preferable.

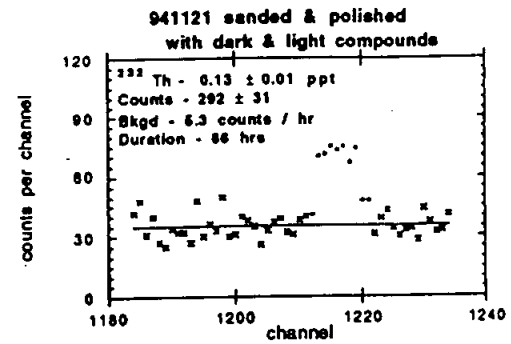
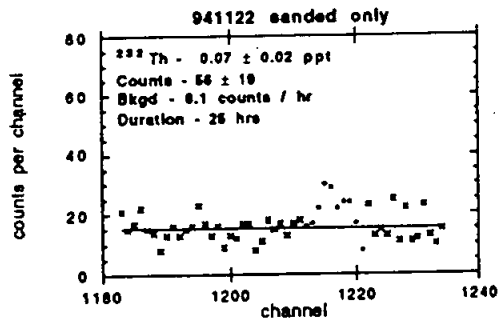
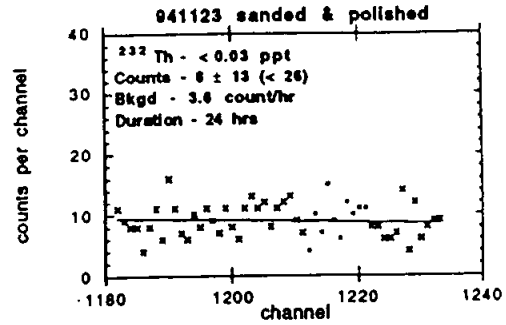
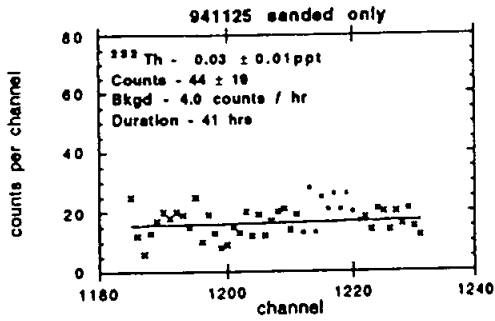
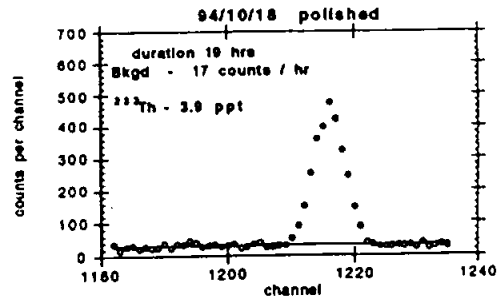
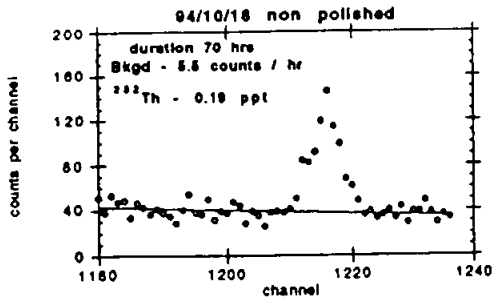
Th concentration in polished acrylic.
Feb 3, 1995



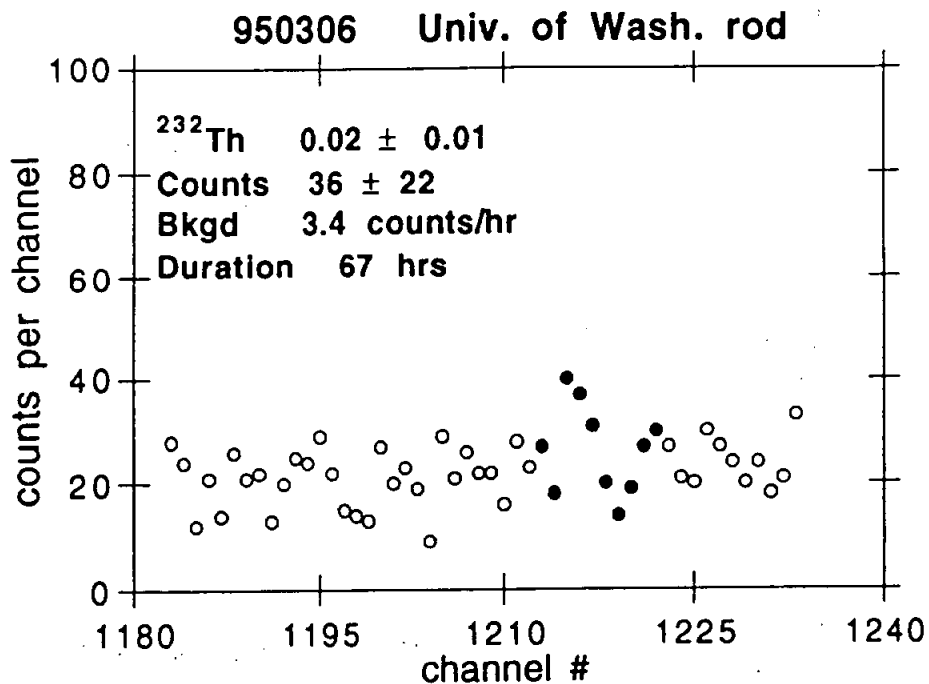
Five samples of acrylic having one surface polished by RPT and the other surface unpolished were analysed for Th and U by NAA. The graph compares the Th concentration on the polished surface (pol) with the concentration on the unpolished surface (not). The graph also shows the background concentration in counts per hour. All of the samples were polished with RPT's 'dark' compound and sample #3 was also polished with their 'light' compound.

The Th concentrations in ppt are, for each pair, [pol/not pol; 3.9/0.19, .015/.03, .13/.07, .91/.29, .12/.66] While the concentration on the first polished sample is rather high the others are well within the SNO specifications and indicate that the polishing is not adding significant Th. Also there is no advantage to using the 'light' polishing compound which involves more labour and skill.

Note also that the backgrounds under the Pa peak vary from sample to sample by as much as an order of magnitude and that the Th levels appear to be correlated with the background particularly if we excluded the 3.9 ppt measurement. RPT is getting the surfaces dirty but the polishing doesn't seem to make the samples worse.



Th content of attachment acrylic.
Mar 3, 1995



A large bar of acrylic was received at CRL from Peter Doe. This was a sample of the material to be used for neutral current attachments to the vessel. A bar 2.5" by 2.5" by 7" was cut out of the middle of sample and was neutron activated. The surfaces were milled off and the central region cut into nine bars for vaporization. The residue was counted for Np and Pa, to measure concentrations of U and Th in the sample. The concentrations were very low and quite acceptable for SNO. The low background indicates that other contaminants are also very low.