



Managed by Brookhaven Science Associates
for the U.S. Department of Energy

Memo

To: Dana Beavis

Re: Gallium Target Irradiation Test

In January we irradiated a Gallium target canned with niobium windows. This was a test irradiation to determine if the reduced thermal load due to the raster installation would allow for increased beam current on the target. The target leaked after roughly 4-5 days of irradiation.

During this irradiation the target was pulled and pictures were taken of the windows and mechanical damage was observed.

These targets were 3-4 years old. In order to assess if the gallium had chemically damaged the windows over time. We took a target that was the same age but unirradiated and opened it. The plan was to remove the gallium, place a liquid surfactant on the window that would then harden and allow us to measure the window for damage. What we observed was the gallium had formed a complex with the niobium window and we could not remove the gallium. Gallium normally forms a liquid with gentle heating, however, no amount of heating resulted in gallium melting. Thus we surmised that the gallium had already chemically bonded with the niobium window and could have accounted for the fragility of the window during irradiation.

In order to assess this we have fabricated a fresh target and want to assess the impact of the rastered beam on the fresh target that has the niobium window in contact with the gallium for a minimal time.

This test irradiation has been discussed, approved and funded by the isotope program headquarters office. There are no programmatic issues or safety issues if the target test irradiation results in the target not surviving. This has been previously demonstrated by the target that was run in January and leaked. No adverse safety or programmatic impacts were noted.

This is an experiment to gain insight into if a fresh target will allow for routine Ge-68 production with a rastered beam.

