ALMD62116100946

THIS DOCUMENT CONSIST OF 3 PAGES
THIS IS COPY 6 OF 6A

MOUND LABORATORY-MONSANTO
Central File No. 62-11-61

Released through the
MOUND LSDR PROJECT
(funded through DOE's OPENNESS INITIATIVE)
Record Copy held at Mound Facility

November 5, 1962

Mr. Haskell D. Weiss
University of California
Lawrence Radiation Laboratory
Livermore, California

Dear Hank:

I am enclosing the differential thermal analysis trace recorded on the plutonium-one weight per cent gallium alloy as it was cooled below room temperature. This trace was recorded when the DTA chamber was immersed in a liquid nitrogen bath until the sample reached -196°C, and subsequently removed from the bath so that the sample slowly warmed to room temperature. With these simplified cooling and heating methods, the base-line of the trace shows a number of extraneous ripples which made the interpretation of the results difficult. The cooling method was so rapid that no phase transformations were observed on the cooling curve.

Since better heat transfer conditions were obtained during the heating cycle, reproducible results were obtained from the heating curves for the six times that this sample was cycled. From the trace, a definite phase transformation is observed which starts at -40°C and peaks at -32°C. The temperature at the start of this phase transformation varied from -35° to -40°C, but the peak was constant at -32°C. No estimate can be made of the heat involved in this transformation since the apparatus has not been calibrated as yet for this low temperature range.

GROUP 1
Excluded from automatic downgrading and declassification

SECRET

RESTRICTED DATA
This document contains restricted data as defined in the Atomic Energy Act of 1954. Its transmittal or the disclosure of its contents in any manner to an unauthorized person is prohibited.

An inflection in the DTA trace is noted at -6°C. This inflection may be significant since, during some of the heating cycles on this alloy, a small peak was seen in the DTA trace at this temperature. The possibility exists, therefore, that another phase transformation which involves a very small heat of transformation occurs at this temperature.

This research into low temperature DTA has been very interesting for us. We will be doing more precise work in this region when suitable modifications are made to our present equipment.

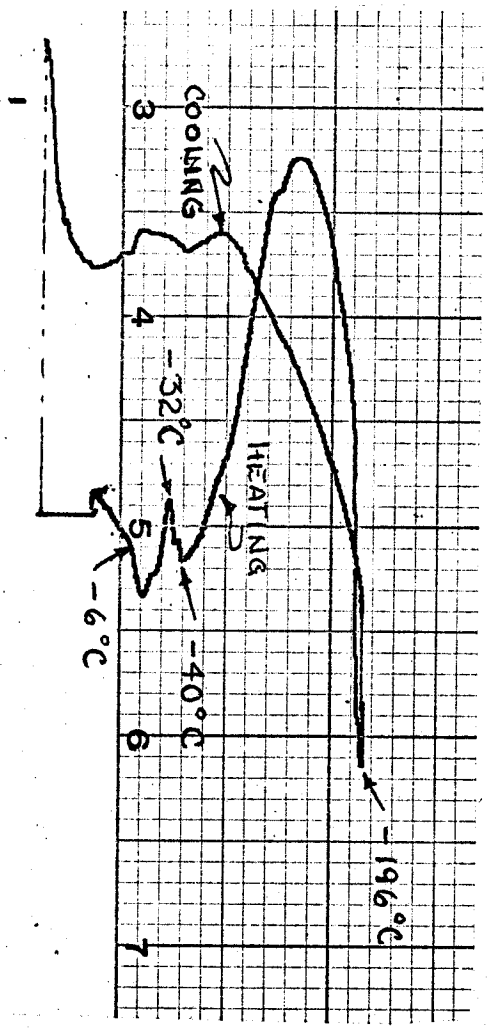
Best regards,

Original Signed By
L. J. WITTENBERG

L. J. Wittenberg, Manager
Reactor Fuels Section

LJW:elt

Distribution:
Copy 1A - H. D. Weiss
Copy 2A - L. V. Jones
Copy 3A - L. J. Wittenberg
Copy 4A - J. F. Eichelberger
Copy 5A - T. B. Rhinehammer
Copy 6A - Central Files



LOW TEMPERATURE DTA STUDY