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NEO TARGET SUPPORT STUDIES

Weekly Report 3

J. W. Weber

March 11, 1965

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BNCO-34

To: M. Lewis, Manager
Chemistry and Metallurgy Operation
R-Reactor Department

From: J. W. Weber
Fuel Design Operation
Battelle-Northwest

IRID THERMAL SUPPORT STUDIES Weekly Report 3

This report describes the results of work done during the period from March 2 through March 8.

Pressure Testing of Zr-2 Tubing at High Temperature

Samples from Zr-2 tubes 1, 6, and 9 that were pressure tested at 800 C, 925 C, and 1100 C respectively and from an unruptured control tube of similar fabrication history have been examined metallographically. In tubes 2 and 6 the ruptures show no relationship in location to the heat zone from the end cap weld. The end of the weld heat zone on tube 9 is obscured because of the high temperature of the pressure test. Hydrogen content of the control and pressure-tested tubes, as determined from the presence of zirconium hydride is essentially zero. The occurrence of the failures in the regions between the end cap and the supports on the pressure-tested tubes and the one irradiated target number 3 is not therefore associated with any observed structural difference in that region compared to the remainder of the tube.

Zr-Al Corrosion - W. E. Garwall

During this report period, corrosion testing of Zircaloy-2 coupons flame-sprayed with various coatings was done in an aluminum bath at 700 C. Tungsten carbide, alumina, zirconia, molybdenum, and tantalum coatings were not attacked appreciably after 50 minutes in the molten bath.

Flame-sprayed as well as annealed and etched coupons were tested in 700 C Al-M and Al-M (approx. 3 w/o M) baths. As compared to the straight aluminum baths, corrosion of all coupons in the Al-M was distinctly slower, and it was nearly nil in the case of Al-M bath. Metallography now being completed will provide a more quantitative description of the above tests.

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Poison-Target Combinations - R. N. Johnson

Experiments are being set up to study the reactions between molten aluminum-lithium and various poison materials. The list of materials now includes:

1. 40% Cd in Cu
2. Cd O
3. Cd
4. Cd_2O_3

Casting of the Cu-Cd alloy has been started and orders were placed for the Cd and CdO. Rods of the various materials will be placed in holes in the center of target element sections, that are now being fabricated, and then heated for various times at 500 to 700 C to study the reaction rates.

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