NC-01-5

L 1-1 ~~3.1-NLO~~

January 11, 1954

DECLASSIFIED PER AUTHORITY OF
C. I. POLSON, NLO 4/23/76
(DATE)
BY J. Campbell 1/17/79
(SIGNATURE) (DATE)

K. O. Beatty
North Carolina State College
Department of Engineering Research
Raleigh, North Carolina

Dear Dr. Beatty:

Thank you for your letter of January 7. I think the action which you have taken will meet with the approval of our Local Area Office. I notice that Dr. Conner has forwarded the necessary paper work to initiate a "Q" clearance for Miss Richardson. Notification of this completed clearance will be forthcoming from the AEC, and I do not anticipate any further problems in this connection.

Enclosed is a report of my visit to North Carolina State College during which we set-up final arrangements for the initiation of your work. I will appreciate receiving any comments on the correctness of my impressions during that visit.

Also, enclosed is a list of chemical analyses on the three uranium-tetrafluoride specimens which I gave you during that visit. PC-102 corresponds to "3620" product, 4C-101 to Plant 4, and A-71 product in MCW, St. Louis. The "3620" product is composited in ten lots totaling 19,200 pounds, produced during the period October 15 to November 15, 1953. The Plant 4 material is a composite of ten lots totaling 50,000 pounds, produced during the period November 12 to November 20, 1953. The MCW unit was obtained from ten lots totaling 38,400 pounds, produced during the period August 17 to October 5, 1953. The analysis of each specimen was thought to closely approximate the averages shown at the bottom of each table.

As per your request, 50 pounds of uranium-tetrafluoride bomb charge, containing a five per cent stoichiometric excess of magnesium turnings, has been shipped Railway Express December 14, 1953. This was followed by a 50 pound shipment on December 21 of Norton dolomite liner obtained at the charging station to the liner tamping machine in Plant 5 here at FMPC.

~~SECRET~~ ~~RESTRICTED DATA~~

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This document contains restricted data as defined in the Atomic Energy Act of 1946. Its transmittal or the disclosure of its contents in any manner to an unauthorized person is prohibited.

You will receive chemical analysis on these materials as soon as they become available.

A bibliography of classified information on the bomb reduction process is being obtained and it is hoped that this information will be in your hands by the end of January.

To date I have been unable to obtain any information in the literature regarding ignition, or reaction, temperatures of $UF_4$-Mg mixture. If this data cannot be obtained from the literature search, an attempt to experimentally establish same will be made here.

We should like to reiterate my recommendation that your test work be carried out in the temperature range of 100-600°F until reaction temperature data becomes available. It seems likely that the reaction should proceed at, or near, 800°F.

Your request for instructions on the proper handling of classified documents and appropriate stamps is being processed here and such material as you requested will be dispatched shortly.

Very truly yours,

John W. Katwick
Metallurgical Department

JWK/wjb

Attachments (2)

cc: F. L. Cuthbert 2A
Central Files 3A
T. G. Runion 4A
J. M. Natrick 5A

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| Lot Number | $UF_4$ | $U^{+4}$ | %AOI | $UO_2F_2$ | Fe | Cu | Cr | Ni | Density |
|---|---|---|---|---|---|---|---|---|---|
| PC102-620 | | 75.73 | | | <10 | 30 | | 50 | 4.3* |
| PC102-622 | | 75.29 | | | <10 | 8 | | 15 | 4.2 |
| PC102-624 | | 74.84 | | | 45 | 35 | | 50 | 4.0 |
| PC102-625 | | 75.29 | | | 40 | 35 | | 90 | 4.0 |
| PC102-628 | | 75.54 | | | 50 | 50 | | 70 | 4.2 |
| PC102-632 | | 75.29 | | | <10 | 25 | | 50 | 4.4 |
| PC102-636 | | 75.49 | | | <10 | 10 | | 20 | 4.[illegible] |
| PC102-637 | | 74.98 | | | 80 | 35 | | 55 | 3.8 |
| PC102-639 | | 75.54 | | | <10 | 30 | | 60 | 4.5 |
| PC102-640 | | 75.34 | | | <10 | 35 | | 70 | 4.4 |
| Average Analysis | | 75.333 | | | 2.45 | 2.93 | | 5.30 | 4.22 |
| 4C101-157 | 97.09 | 74.27 | 0.81 | 2.10 | 12 | 2 | 3 | 14 | 2.96** |
| 4C101-159 | 97.61 | 74.58 | 0.66 | 1.73 | 14 | 2 | 2 | 15 | 2.86 |
| 4C101-161 | 97.32 | 74.19 | 0.51 | 2.17 | 14 | 2 | 3 | 28 | 2.63 |
| 4C101-162 | 98.01 | 74.24 | 0.28 | 1.71 | 18 | 4 | 3 | 17 | 2.94 |
| 4C101-163 | 97.93 | 74.47 | 0.40 | 1.67 | 15 | 10 | 2 | 25 | 2.86 |
| 4C101-164 | 97.94 | 74.16 | 0.08 | 1.98 | 15 | 3 | 2 | 14 | 2.86 |
| 4C101-165 | 98.51 | 74.75 | 0.13 | 1.36 | 14 | 3 | 3 | 12 | 2.78 |
| 4C101-166 | 98.52 | 74.65 | 0.07 | 1.41 | 16 | 4 | 3 | 14 | 2.94 |
| 4C101-167 | 97.76 | 74.43 | 0.45 | 1.79 | 18 | 6 | 3 | 20 | 2.78 |
| 4C101-169 | 97.49 | 74.43 | 0.84 | 1.29 | 14 | 4 | 2 | 16 | 2.78 |
| Average Analysis | 97.82 | 74.42 | .423 | 1.721 | 15 | 4 | 2.6 | 17.5 | 2.839 |
| A71-1297 | 97.33 | 74.12 | 0.37 | 2.37 | 15 | 1 | <1 | 9 | |
| A71-1326 | 97.21 | 75.20 | 1.70 | 0.97 | 16 | 2 | <1 | 10 | |
| A71-1334 | 97.20 | 74.87 | 1.34 | 1.40 | 16 | 1 | 1 | 18 | |
| A71-1349 | 97.48 | 74.54 | 0.72 | 1.82 | 19 | 3 | 1 | 29 | |
| A71-1405 | 98.09 | 74.96 | 0.67 | 1.28 | 22 | 3 | 2 | 15 | |
| A71-1439 | 98.55 | 75.13 | 0.47 | 1.06 | 15 | 2 | <1 | 8 | |
| A71-1512 | 97.37 | 75.19 | 1.55 | 0.98 | 18 | 1 | <1 | 10 | |
| A71-1632 | 97.18 | 74.77 | 1.24 | 1.53 | 14 | 2 | 1 | 9 | |
| A71-1663 | 97.05 | 75.11 | 1.74 | 1.09 | 13 | 2 | 1 | 9 | |
| A71-1723 | 97.22 | 74.78 | 1.22 | 1.51 | 19 | 2 | <1 | 14 | |
| Average Analysis | 97.68 | 74.87 | 1.10 | 1.40 | 16.7 | 1.8 | .6 | 13.1 | |

* Tap Density
** Apparent, or Bulk Density

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