

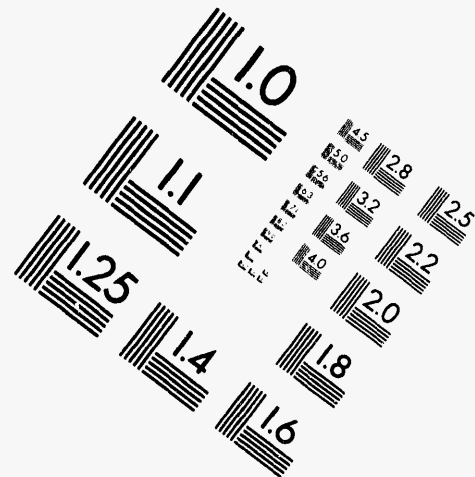
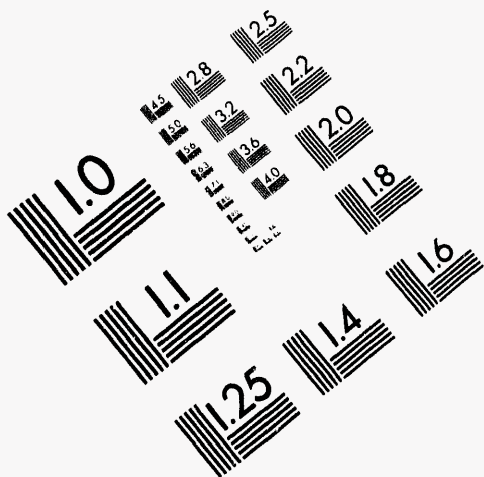


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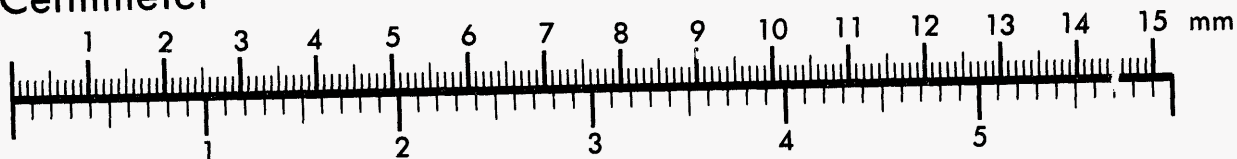
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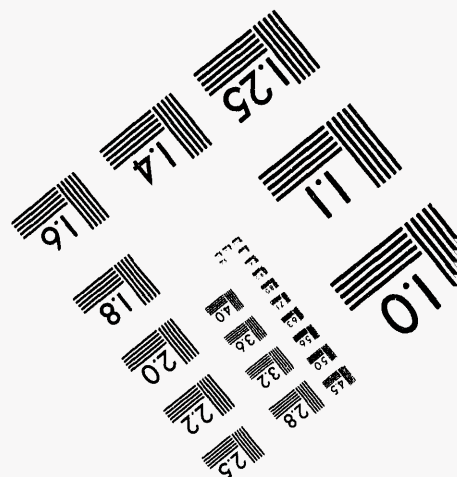
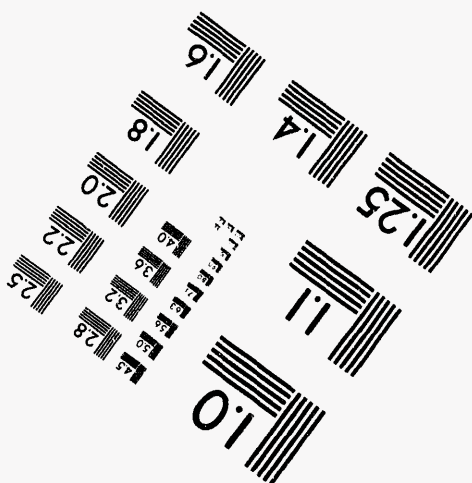
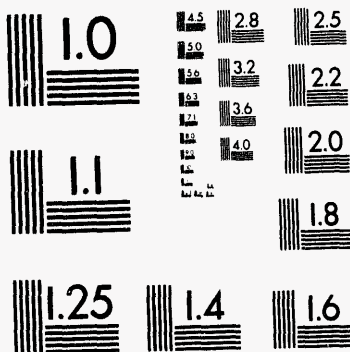
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Centimeter



Inches



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By Quinn Foley 4-20-94  
Verified By J.G. Presler 4/20/94

- CC: #1 - W. E. Jordan
- #2 - W. G. Kay - 700
- #3 - E. E. Smith - 300
- #4 - G. H. Green - E. R. Lunt
- #5 - G. W. J. Wanda - G. V. Packer
- #6 - Pink
- #7 - Yellow



THIS DOCUMENT CONSISTS OF 2 PAGES



JANUARY 28, 1948



TEK Division

TO: W. E. JORDAN  
FROM: G. V. PACKER

POLONIUM PRODUCTION: PREDICTED CONCENTRATION VS. CUSTOMER'S ASSAYS

Summary

The customer's assays of two complete tubes of bismuth have been reviewed, and are found to be in reasonably good agreement with the polonium concentration as predicted by our current procedure. Improvement of our procedure may be possible on the basis of additional data; however, it does not appear advisable to make any change at present.

Discussion

The polonium content of two complete tubes of bismuth, as determined by the customer on the basis of (a) alpha measurements and (b) chemical assays, have been reported in Rogers to Mackey, "Assay of Postum Shipment", December 28, 1945, Doc. No. 7707. Since this is the first time that assay data have been available on complete tubes, it was desirable to compare these data with the amounts predicted according to the formula and charts given by L. Marshall, "Polonium Production", November 9, 1945, Doc. No. 7-2883, which are now in routine use by the P Department. This formula was derived from assay data on mixtures of slugs from various shipments, and was therefore subject to some uncertainty.

The pertinent data are tabulated below. The symbols follow the notation of Mrs. Marshall's memo.

Batch	D-2738	D-2800
Date charged	8-3-45	8-20-45
Date discharged	8-18-45	8-20-45
T: Average ambient temperature rise	28.5°	25.1°
t: Total days in pile	105	123
t <sub>0</sub> : Days between discharge and assay	24	45
P: (Net accumulated during exposure)/t	27,151/105	21,577/123
P <sub>0</sub> : Average power during operation	27,151/75	21,577/115
V(t, t <sub>0</sub> ): Exponential function for growth and decay	6.4	11.8

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Curies per tube; Calculated as of 11/18/45	291	376
Customer's assay on 11/18/45	258	342
Alpha measurement, corrected to 11/18/45	290	399

These results indicate that discrepancies between the customer's two methods of assay are of the same order as the difference between his assays and our estimates. For the present at least, the data are insufficient to justify revision of the formula.

  
U. V. Paolier  
100 Technical

GVP:hp

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