~~SECRET~~ TMG-M36

~~SECURITY INFORMATION~~

Redacted VERSION

UNCLASSIFIED

SAP 20006976 0000
Unique Document #

THIS IS A COVER SHEET FOR A CLASSIFIED DOCUMENT

TRANSMITTAL OF THIS DOCUMENT MUST BE COVERED BY A SIGNED RECEIPT. IT MUST NOT BE LEFT UNATTENDED OR WHERE AN UNAUTHORIZED PERSON MAY HAVE ACCESS TO IT. WHEN NOT IN USE, IT MUST BE STORED IN A LOCKED FILE OR SAFE. WHILE THIS DOCUMENT IS IN YOUR POSSESSION AND UNTIL YOU HAVE OBTAINED A SIGNED RECEIPT UPON ITS TRANSFER TO AN AUTHORIZED INDIVIDUAL, IT IS YOUR RESPONSIBILITY TO KEEP IT AND ITS CONTENTS FROM ANY UNAUTHORIZED PERSON.

RESTRICTED DATA

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.

[redacted]

UNCLASSIFIED

WD-family

~~SECRET~~

~~SECURITY INFORMATION~~

Cat. 51

~~SECRET~~
~~SECURITY INFORMATION~~

Symbol: TM-74

Group Ref: TMG-M36

This document consists of 6 pages, 3 Figs.
~~No. 12 of 22 copies. Series A~~

August 30, 1952

9 pgs total

MINUTES OF THE THIRTY-SIXTH MEETING OF THE THEORETICAL MEGATON GROUP

27 August 1952

1. The thirty-sixth meeting of the TMG convened at 9:00 AM on Wednesday, 27 August 1952, in the W-Division Conference Room. Those present were:

H. A. Bethe	C. L. Longmire
G. Breit	J. C. Mark, Chairman
W. C. Bright	H. L. Mayer
A. A. Broyles	L. W. Nordheim
K. M. Case	W. E. Ogle
G. A. Cowan	J. C. Potts
F. de Hoffmann	F. Reines
C. Evans	R. D. Richtmyer
F. Evans	A. Rosenbluth
E. Fermi	M. Rosenbluth
B. E. Freeman	P. R. Stein
G. Goertzel	B. R. Suydam
M. G. Holloway	T. B. Taylor
F. C. Hoyt	B. E. Watt
R. M. Landshoff	E. J. Zadina

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW
1ST REVIEW-DATE: 8-14-97
AUTHORITY: DADC DADC ADD
NAME: [illegible]
2ND REVIEW-DATE: 9/3/97
AUTHORITY: ADD
NAME: [illegible]
DETERMINATION [CIRCLE NUMBER(S)]
1. CLASSIFICATION RETAINED
2. CLASSIFICATION CHANGED TO:
3. CONTAINS NO DOE CLASSIFIED INFO
4. COORDINATE WITH:
5. CLASSIFICATION CANCELLED
6. CLASSIFIED INFO BRACKETED
7. OTHER (SPECIFY):

Topics

2. Corrections to previous minutes.
3. A. C. calculations.
4. Status of λ calculations.
5. Fission cross-section of 29.
6. Upshot experiments.

RESTRICTED DATA
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.

2. Corrections

Fig. 1 of the last minutes contains a few errors and some of the numbers were changed as follows.

DOE b(3)

UNCLASSIFIED

~~SECRET~~
~~SECURITY INFORMATION~~

4. Status of λ Calculations (de Hoffmann)

[redacted]

DOE b(3)

5. Fission Cross-section of 29

Bethe reported on a measurement by Ghiorso in which foils of 28 containing less than one per mil 25 were irradiated in the Arco high flux pile, and their fission activity determined as a function of time after the end of the irradiation. The activity is mainly due to 49 but just after the irradiation there is some contribution due to 29 which permits determination of its fission cross-section. Bethe's evaluation is as follows:

Let

a = rate of 29 production

t_r = time of irradiation (60 min)

τ_2 = lifetime of 29 (34 min)

τ_3 = lifetime of 39 (4800 min)

σ_2 = fission cross-section of 29

σ_4 = fission cross-section of 49

$s = t_r/\tau_2$.

The fission activity at a time $t \ll \tau_3$ after the end of the irradiation is then

$$F = \frac{at_r}{\tau_3}\left[\sigma_4\left(t + \frac{1}{2}t_r - \tau_2\right) + \frac{1-e^{-s}}{s}(\sigma_4\tau_2 + \sigma_2\tau_3)e^{-t/\tau_2}\right].$$

The initial value of the decaying part of F should be

$$A = \frac{at_r}{\tau_3}\frac{1-e^{-s}}{s}(\sigma_2\tau_3 + \sigma_4\tau_2).$$

The measured value was $A = 0.022 \pm 0.005$. When $t \gg \tau_3$ the amount of 49 will be at_r and the fission rate is then $p = \sigma_4 at_r$. This was measured to be 2.83. From these data the part of A due to σ_4 has the value 0.009, leaving 0.013 ± 0.005 to be attributed to σ_2. This leads to $\sigma_2 = 7 \pm 3$ b.

[redacted]

DOE b(3)

Distribution:

1A - H. Barschall
2A - G. Bell
3A - H. A. Bethe
4A - W. Bouricius
5A - N. E. Bradbury
6A - S. W. Burriss
7A - J. Calkin
8A - B. G. Carlson
9A - E. D. Cashwell
10A - F. de Hoffmann
11A - F. Evans
12A - B. E. Freeman
13A - D. K. Froman
14A - A. C. Graves
15A - L. E. Hightower
16A - M. G. Holloway
17A - F. C. Hoyt
18A - E. R. Jette
19A - R. M. Landshoff
20A - C. L. Longmire
21A - J. C. Mark
22A - H. L. Mayer
23A - N. Metropolis
24A - L. W. Nordheim
25A - W. E. Ogle
26A - J. Pasta
27A - F. Reines
28A - R. D. Richtmyer
29A - M. Rosenbluth
30A - R. W. Spence
31A - P. R. Stein
32A - E. Teller
33A - J. L. Tuck
34A - S. M. Ulam
35A - J. von Neumann
36A - M. C. Walske
37A - B. E. Watt
38A - J. A. Wheeler
39A - H. F. York
40A - E. J. Zadina
41A - Report Library
42A - Report Library

UNCLASSIFIED

UNCLASSIFIED

Fig. 2

UNCLASSIFIED

Fig. 3

UNCLASSIFIED