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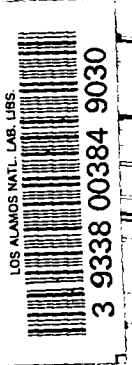
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Per B Palantinos, FSS-16 Date: 8/22/95
By James D. B., CIC-14 Date: 9/18/95

Classification changed by

Doc Rm / V. H. ...
3-17-51

Physics - nuclear reactions, etc.



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(From Discussions on 4/21 -24/43)
***J. H. Manley

I. DETECTION

1. Threshold detectors

a) Fission

Z group will undertake procurement of Pa, Io and rough preliminary measurements. W group will extend measurements of 23 cross-section to higher energies with maximum precision and will procure and measure the fission of Th. Pa and Io will be measured when available.

b) Other processes

Z will prepare and measure the activity of suitable n-, n-p, n- threshold detectors to be irradiated by N.

2. GMP counter

Z will continue with development of such instruments including the addition of an anti-coincidence stage for differential range measurements. Although Z assumes the responsibility W and X are included in plans, personnel and testing.

3. Ion Chambers

Similar arrangement to I.2. above.

4. Photographic Plates

All work in W group - Richards in charge.

5. Cloud Chamber

No work thereon contemplated.

6. Slow neutron detectors

Z will supply and calibrate thermal neutron detecting foils.

II. TECHNIQUES

1. Short time measurements

Fast counter studies, development of appropriate circuits, and source modulation have not been considered in detail except that K, J, Froman and Bacher groups are concerned. Bacher will be responsible for communication of Radiation Laboratory techniques which are applicable.

2. Artificial fission neutron spectrum

Needermyer will assume responsibility for research.

3. Fission counting with high alpha background

Kennedy and Segre

4. Source standardization

Z will set up a graphite column for standardization of portable sources and will be responsible in a general way for such work in the Laboratory.

members of the present staff of the same laboratory to without specific instructions.

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III. TAMPER RESEARCH (Material of present interest: U, Pu, Bi, Pb)

1. Scattering

W will work on tamper materials with 0.3 Mev neutrons and investigate possibilities of suitable detectors for measuring inelastic scattering energy loss. The final investigation of tamper properties with other neutron energies will be done by W.

2. Capture

W and Segre will investigate capture in tamper materials

3. Shell type integral experiment

This will be done by W or Fermi.

IV. PROPERTIES OF FISSIONABLE MATERIALS (25, 23, 49, 23, 91)

1. Neutron number ν

$\nu(49)/\nu(25)$ with 200 ν of 49. It seems doubtful if a sufficiently low fast neutron background can be obtained in a cyclotron-irradiated graphite column. It can be done in Chicago or with a modulated cyclotron although in the latter case the intensity is low. Discussion as to the best method is continuing including the use of the Li(p,n) reaction as a source. Other ν 's have not been discussed.

2. Spectrum

(25). Richards will measure plates already obtained and the Stanford work will continue.

3. Delayed Emission

W group will proceed with the method of Baker.

4. Spontaneous fission

Continued work by Kennedy and Segre

5. Shell type experiment on normal uranium

W or Fermi. Use of hydrogen ionization to measure E_{α} suggested by Bethe.

6. Inelastic scattering

7. Capture

8. Total cross-section

9. Fission cross-sections

*postponed for lack of material.

a) W will continue 25 with emphasis at < 0.4 and > 1.0 e.v. data. W will also measure 49, 23, 91. These are to yield absolute cross-sections.

b) $\sigma(25)/\sigma(23)$ relative measurement to check $1/v$ law to be done by W or with a photo-source, in the 100-100,000 e.v. region with boron absorbers to change the neutron energy distribution.

COPIES TO:

- W. E. Allison
- R. Bacher
- E. Fermi
- J. Kennedy
- J. R. Manley
- J. R. Oppenheimer
- W. Segre
- R. Serber
- E. Waldman
- J. Williams
- R. Wilson
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