Proceedings of the Iowa Academy of Science

Volume 47 | Annual Issue Article 76

1940

The Resonance in the B-P-a Reaction

W. B. McLean
State University of Iowa

V. J. Young
State University of Iowa

W. L. Whitson
State University of Iowa

G. J. Plain
State University of Iowa

A. Ellett
State University of Iowa

DISTRIBUTION IN ANGLE OF ALPHA PARTICLES FROM $Li^7 + H^1$

V. J. YOUNG, G. J. PLAIN, W. B. MCLEAN, A. ELLETT

We find the distribution of alpha particles from $Li^7 + H^1$ is not spherically symmetric, a result in disagreement with the conclusions of earlier investigators,[1] who, however, worked at rather low energies only.

Thick target data at energies as low as 150 ekv show the presence of a small $\cos^2 \Theta$ term and may be represented by

$$I(\Theta) = 1 + .16 \cos^2 \Theta$$

while at 440 ekv the asymmetry is very marked, the data being well represented by

$$I(\Theta) = 1 + .7 \cos^2 \Theta.$$

Because of the rapid increase of yield with energy, it is to be expected that thin target data will show a slightly but only slightly greater $\cos^2 \Theta$ term. Preliminary thin target data appear to bear this out.

1 F. Kirchner, Phys. Zeits, 34, *785*, 1933. J. Giarratana and C. G. Brennecke, Phys. Rev. 49, *35*, 1936. H. Neuert, Ann. d. Phys. 36, *437*, 1939.

DEPARTMENT OF PHYSICS,
STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.
IOWA STATE COLLEGE,
AMES, IOWA.

THE RESONANCE IN THE B-P-a REACTION

W. B. MCLEAN, V. J. YOUNG, W. L. WHITSON, G. J. PLAIN, A. ELLETT

The yield of alpha particles of range greater than 2 cms. from boron bombarded by protons has been studied as a function of bombarding energy in the range from 100 to 200 ekv, using a thin target, either methyl borate or boron trifluoride at pressures of 1 mm. of Hg. The yield vs. energy curve shows an approximately exponential rise on which is superposed a sharp (half breadth $\sim$ 6 ekv) intense line at 150 $\pm$ ekv. There is some indication of a weaker and much broader line at 190 ekv. Number range curves are not yet available, but the appearance of pulses on the oscillo-

graph screen leads us to suppose that the high yield (line) at 150 ekv is due to emission of a homogeneous long-range group.

PHYSICS DEPARTMENT,
STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.

DISTRIBUTION IN ANGLE OF ALPHA PARTICLES FROM $F^{19} + H^1$

A. ELLETT, W. B. MCLEAN, V. J. YOUNG, G. J. PLAIN

The distribution in angle of long range alpha particles from fluorine bombarded by protons has been studied in the range 270 - 440 ekv. The distribution shows a very strong concentration in the forward direction. Intensity as a function of angle in the center of mass system may be represented by the equation

$$I(\Theta) = 1 + .77 \cos \Theta + .17 \cos^2 \Theta$$

for a bombarding energy of 375 ekv. The distribution shows little, if any, energy dependence and in particular is not observably different at 330 ekv bombarding energy.

Targets were prepared by electrolyzing hydrogen fluoride on tantalum and were fairly thin, the apparent half width of the 330 ekv gamma ray line being 40 ekv or less.

DEPARTMENT OF PHYSICS,
STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.

A HEAT VAPORIZATION EXPERIMENT FOR ELEMENTARY LABORATORY

L. T. EARLS

An electric heating coil is used in an ordinary pint vacuum bottle to evaporate water under steady state conditions. The system is used on a platform balance; the heat of vaporization is determined from total energy input and total change of weight. Sources of error are discussed and accuracy obtainable in actual use is indicated.

PHYSICS DEPARTMENT,
IOWA STATE COLLEGE,
AMES, IOWA.