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**AN ANALYSIS
OF (n, 2n) CROSS-SECTION MEASUREMENTS
FOR NUCLEI UP TO MASS 238**

by

**W. G. Davey, R. W. Goin,
and J. R. Ross**

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W. G. Davey,* R. W. Goin,
and J. R. Ross

Applied Physics Division

June 1975

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AN ANALYSIS OF (n, 2n) CROSS-SECTION MEASUREMENTS FOR NUCLEI UP TO MASS 238

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ABSTRACT

All suitable measurements of the energy dependence of (n, 2n) cross sections of all isotopes up to mass 238 have been analyzed. The objectives were to display the quality of the measured data for each isotope and to examine the systematic dependence of the (n, 2n) cross section upon N, Z, and A. Graphs and tables are presented of the ratio of the asymptotic (n, 2n) and nonelastic cross section to the neutron-asymmetry parameter $(N - Z)/A$. Similar data are presented for the derived nuclear temperature, T, and level-density parameter, α , as a function of N, Z, and A.

This analysis of the results of over 145 experiments on 61 isotopes is essentially a complete review of the current status of (n, 2n) cross-section measurements.

I. INTRODUCTION

In a D-T fusion reactor, one neutron is produced for each tritium nucleus destroyed and, in a self-sustaining system, it is essential that this neutron be used to breed additional tritium by reactions in ${}^6\text{Li}$ and ${}^7\text{Li}$. To achieve this end, a breeding blanket containing lithium in some form must be wrapped around the fusing region (plasma or pellet), and this blanket must not only allow a tritium breeding ratio greater than unity, but must also permit efficient removal (as heat) of about three-fourths of the energy generated in the fusion reactor and contribute substantially towards shielding. The inability in practice of surrounding the fusing region completely results in leakage losses, and neutron capture in structural and coolant components causes additional losses. Clearly, the initial single neutron per fusion must be multiplied to satisfy these and other sources of loss, and (n, 2n) reactions in the blanket generally provide the multiplication mechanism.

In a given projected fusion-reactor design, only a limited number of isotopes are included, but there are many existing projected designs and many more will undoubtedly evolve as fusion-reactor studies progress. Consequently,

there is a clear need for reasonably accurate knowledge of $(n, 2n)$ cross sections for a wide range of isotopes. Such high-energy cross sections as these tend to be incomplete both in the energy range covered and in the number of isotopes studied; furthermore, the many measurements obtained over the past two decades are, superficially at least, more characterized by their differences than by their agreements. Additionally, the fact that the resulting nucleus may often decay in more than one way can mean that some apparently good measurements are only measurements of part of the $(n, 2n)$ cross section. A well-known example of this latter case in fusion-reactor studies is that of niobium, where the earlier data used were in error by a factor of more than two.

A possible solution is, of course, to attempt to establish the systematics of the behavior of $(n, 2n)$ cross sections. In this way, incomplete or erroneous measurements may be identified, measurements made on different isotopes may be used to supplement each other, and, finally and hopefully, good predictions may be made of cross sections even where they have not been measured. This approach has been used many times but has not, in general, addressed itself to a wide range of data. In fact, as we discuss in the next section, some widely used calculations are based upon an important early study which necessarily examined a limited range of experimental data. Consequently, although the conclusions of these studies are not necessarily in error, the experimental verification is limited and the degree of elaboration used may not introduce significant improvement in the accuracy of prediction.

The intent in the present work is to extend the range of the experimental work studied to cover essentially all the experimental data available up to mass 238. We have also introduced some modifications and hopefully improvements over earlier work, but the prime objective has been completeness and not sophistication. In fact, we should state at the outset that our work indicates a considerable degree of confusion and even contradiction and does not provide sufficiently accurate predictions of $(n, 2n)$ cross sections for all materials of fusion-reactor interest; one of our conclusions is that further experiments are needed. However, we believe that certain broad trends are confirmed, the existence of magic-number effects is examined, and, at minimum, a complete status report is provided with benefit to future studies.

II. OUTLINE OF THE PRESENT STUDY

This work consists of the study of the energy-dependent (shape) measurements of $(n, 2n)$ cross sections.

The pioneer work in the elucidation of $(n, 2n)$ systematics was performed in Los Alamos in 1961 by Barr, Browne, and Gilmore¹ in their analysis of the measurements of Prestwood and Bayhurst² and one measurement of Knight, Smith, and Warren.³ The data (for 15 isotopes) were chosen on the basis that they were recent, covered an extensive energy range, and were

performed in the same laboratory using consistent experimental methods. These conditions offered a good possibility of identifying systematic behavior.

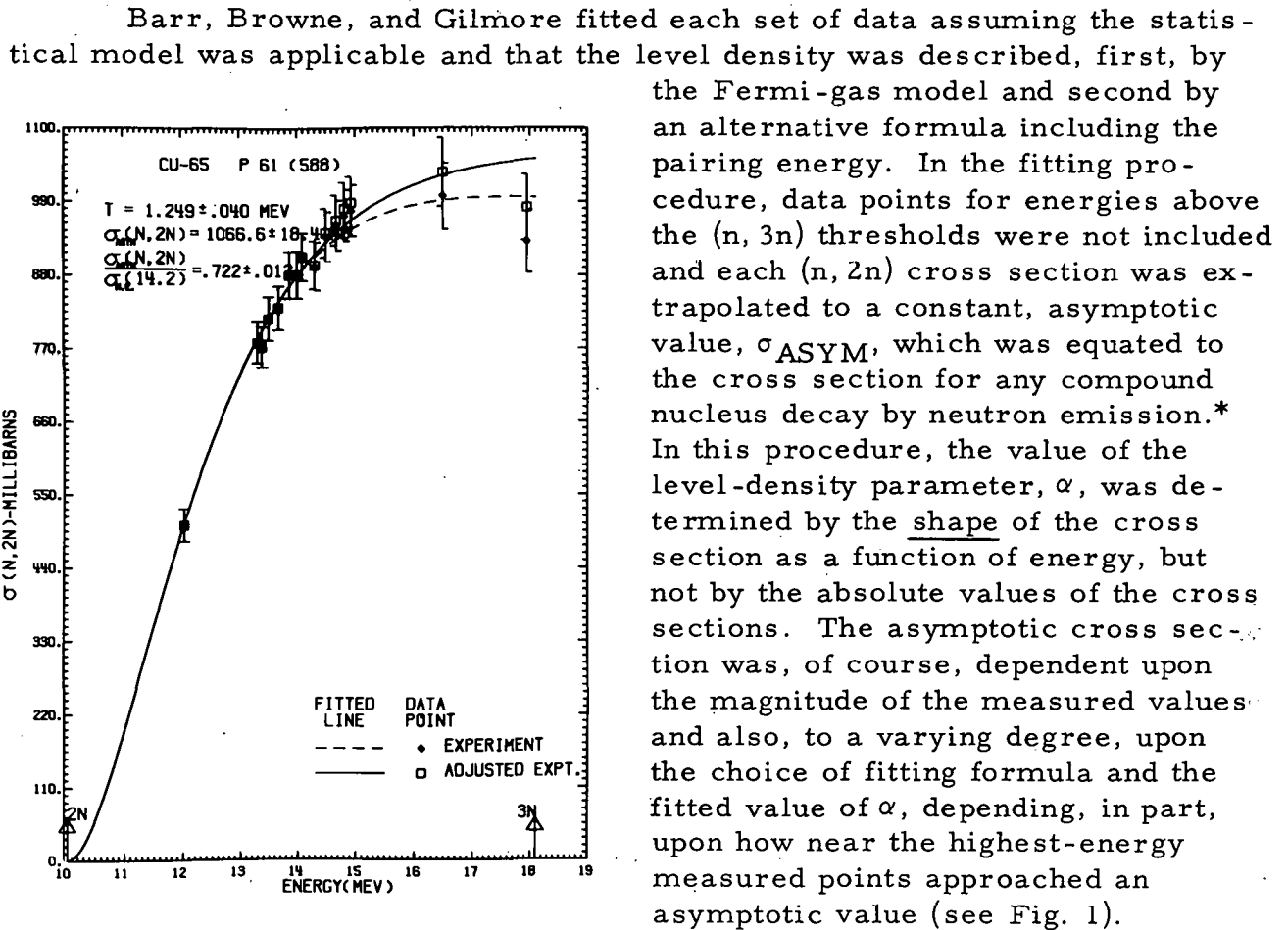


Fig. 1. Typical Fit of Data to the Constant-temperature Nuclear Model. ANL Neg. No. 103-B11676.

Implicit in the fitting formula was the assumption that the compound-nucleus-formation cross section was constant over the energy range of the measurements. The formula also assumed that the inelastic and the (n, 2n) reactions are competitive, and that reactions competing with the (n, 2n) cross section are either constant over the range of the measurement, or are negligible.

Using the Fermi-gas formula, Barr, Browne, and Gilmore found that the level-density parameter was reasonably well described by

$$\alpha = A/13 \text{ MeV}^{-1}, \quad (1)$$

where A is the target mass number for nuclei between the lowest mass studied, 40, and about 120, but that a modified formula

*The asymptotic cross section for any neutron emission from the compound nucleus was denoted by $\sigma(n, M)$ in Ref. 1.

$$\alpha = 10(1 - 1.49e^{-0.017A}) \text{ MeV}^{-1} \quad (2)$$

had to be used to include the single additional point (^{238}U) above mass 120 (see Fig. 2).

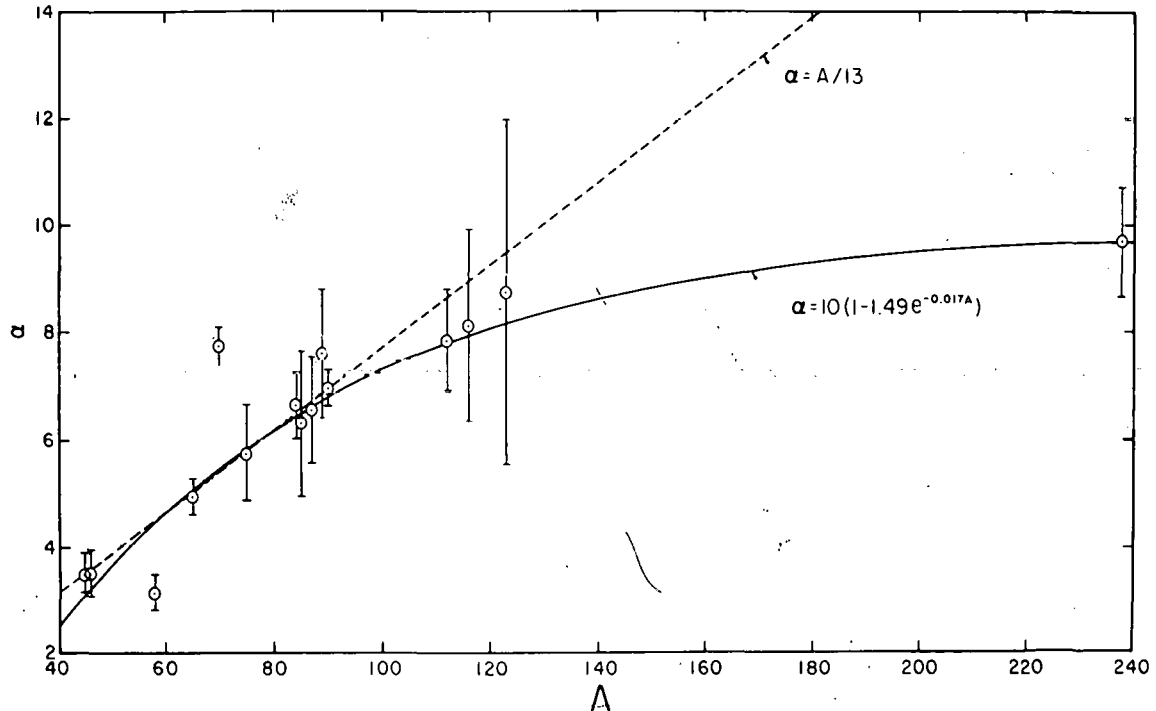


Fig. 2. Correlation of the Level-density Parameter, α , from the Least-squares Calculations with Target Mass Number. ANL Neg. No. 103-B11667.

Perhaps even more importantly, they found that the ratio $\sigma_{\text{ASYM}}/\sigma_{\text{ne}}$, where σ_{ne} is the nonelastic cross section (equated to the compound-nucleus formation cross section), was well described as a function of the neutron excess parameter $(N - Z)/A$ by the empirical relationship (see Fig. 3)

$$\frac{\sigma_{\text{ASYM}}}{\sigma_{\text{ne}}} = 1 - 1.754e^{-18.14(N-Z)/A} \quad (3)$$

Only one experimental point deviated significantly from the curve shown in Fig. 3, and this could plausibly be attributed to errors arising from the uncertainty in the decay scheme of the relevant isotope.

In deriving this formula, they assumed that σ_{ne} was not dependent on energy and was given by the formula of Flerov and Talyzin,⁴ namely

$$\sigma_{\text{ne}} = \pi(0.12A^{1/3} + 0.21)^2 \text{ barns.} \quad (4)$$

This formula was derived in 1957 and was based entirely upon measurements at and near 14 MeV.

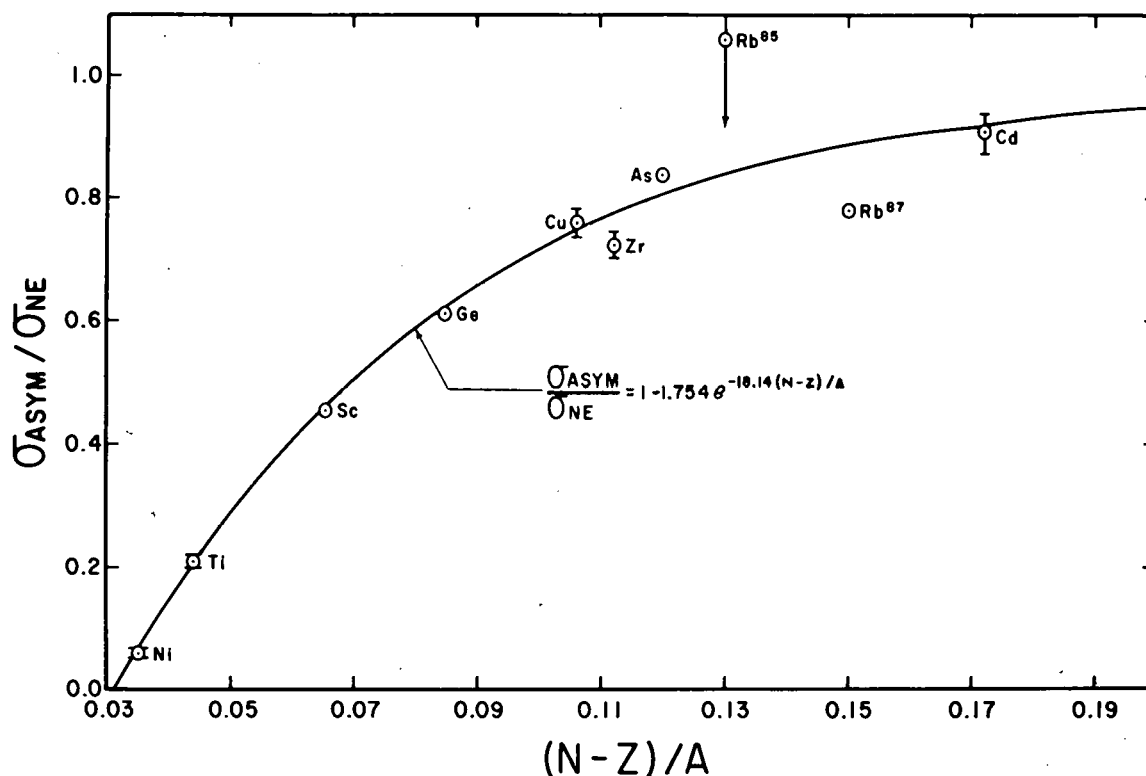


Fig. 3. Empirical Correlation of the Least-squares-fixed Parameter $\sigma_{ASYM}(n, 2n)$. ANL Neg. No. 103-B11578.

We have described the work of Barr, Browne, and Gilmore in some detail because it is the basis of our own and other studies of $(n, 2n)$ systematics. Here we must note that the empirical relationship for σ_{ASYM} defined by Eqs. 3 and 4 is strictly valid only for the particular formulas used by Barr, Browne, and Gilmore, and the level-density parameters given by Eq. 1 or 2. Thus, for example, the widely used study by Pearlstein⁵ (recently extended to include other reactions⁶), which uses the relationships of Eqs. 3 and 4 but, for example, level-density formulas not derived from $(n, 2n)$ measurements, and which include shell effects (and differing in Refs. 5 and 6), includes this inconsistency.

Our own work is closely based upon the work of Barr, Browne, and Gilmore, but differs from it in the following respects:

1. We have used the many measurements of the nonelastic cross section to allow for the significant decrease that occurs at energies above about 14 MeV.

2. We have analyzed essentially all the measured $(n, 2n)$ energy-dependent data available up to mid-1973. The data obtained in each experiment were analyzed separately to avoid sources of error arising from mixing inconsistent data and included about 150 sets of data for over six isotopes.

3. We have fitted two formulas, based on a constant-temperature model and a level-density formulation. The level-density formula is somewhat simpler than that used by Barr, Browne, and Gilmore.

4. We have not included in the analysis any data points that lie close to the $(n, 2n)$ threshold, since we believe that uncertainties in the neutron energies could give inordinate errors in the fitted parameters if these data points are not deleted. As with Barr, Browne, and Gilmore, all data points at and above the $(n, 3n)$ threshold are deleted.

The sources of data included all traceable sources up to and including the 1973 Supplement to the CINDA Index.⁷ The microfilm data listing prepared by Livermore⁸ was very valuable in the data search, and references to that file are included in the sources given later.

III. ENERGY DEPENDENCE OF THE NONELASTIC CROSS SECTION

As discussed in the previous section, analyses of $(n, 2n)$ cross sections must make some postulate regarding the energy dependence of the compound-nucleus formation cross section (or nonelastic cross section), and in all prior analyses, it has been assumed that this is not energy-dependent. This assumption is certainly incorrect, since measurements exist that show that this cross section decreases significantly in the 15- to 20-MeV range, the energy of the onset of the decrease being less for lower-mass nuclei. Since $(n, 2n)$ reactions lie largely in this energy range, significant errors can be made by not including this effect for medium- and low-mass nuclei, although the effect is small for high-mass nuclei.

The procedure we have adopted here is to collect and analyze all available measurements of the nonelastic cross section in the range of about 10-100 MeV and obtain empirical fits to these data as a function of neutron energy and target mass. The parameters entering into these fits were then plotted, and smoothed functions of these were used to correct for the energy and mass dependence. Details of these latter are given in Sec. IV.

The experimental data available are very numerous and details are relegated to Appendix A, and only the results of the analyses and fits will be discussed at this point. However, we would note that the Flerov-Talyzin data often used to describe the nonelastic cross section (see Sec. II) represent only one set of experiments at one energy, whereas nearly 50 sets of data available from about 10 to 1400 MeV have been used in the present work.

The measurements of the mass and energy dependence of σ_{ne} are illustrated in Fig. 4. Here we show weighted means of some of the experimental data obtained for the energy ranges 7-9, 9-11, 12-13, 13.9-14, and 14.8-20 MeV, and at 21.0, 25.5, 29.2, 55, 81, 105, and 140 MeV, together with fitted curves. Here the plots are of $\sqrt{\sigma/\pi}$ versus $A^{1/3}$, since a linear relationship is anticipated

for the simple case of a black, constant-density nucleus and many of the points are well-described by this relationship. Experimental errors have been omitted in the interest of clarity, but they are generally quite small and of the order of the deviations of the points from the fitted lines.

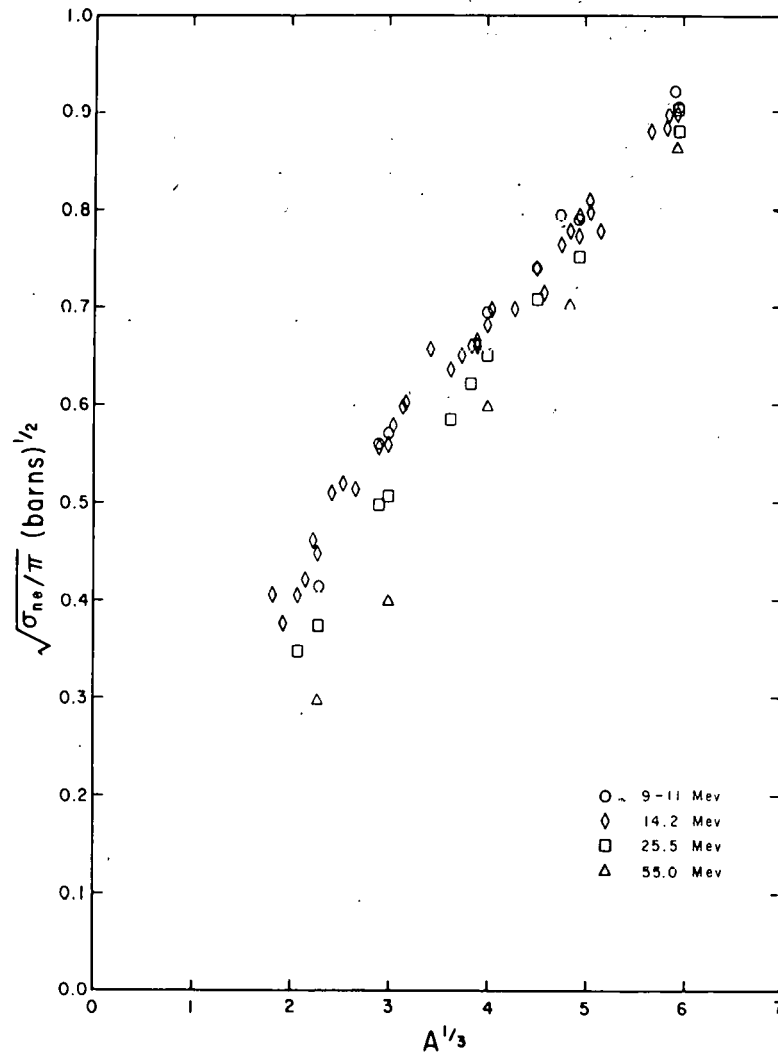


Fig. 4. Nonelastic Cross Section as a Function of $A^{1/3}$ and Energy. ANL Neg. No. 103-B11669.

As can be seen, very many elements have been studied close to 14.2 MeV and, indeed, most of the experimental points plotted here are the weighted mean values of several separate experiments. At other energies the information is much more sparse, and at the higher energies the data points usually represent the result of only one experiment. Clearly, a linear relationship is always satisfactory and usually an excellent representation of the data for nuclei of mass greater than about 25-30, and it is only in the case of the 14-MeV data that there is sufficient detail to indicate that a better fit would be a higher-order curve passing through the origin. In general, a linear fit to each set of data for masses greater than about 25 does not pass through the origin and the

small number of lower mass points (often only one) indicate that the general shape for all energies is a downward-curving plot passing through the origin as shown by the 14-MeV data. Furthermore, the experimental data below 14 MeV show no significant evidence that they differ from the more precise and complete 14-MeV values, and we conclude that the nonelastic cross section is constant for all nuclei up to at least this energy.

In view of the above observations, we have chosen to represent the non-elastic cross section at each neutron energy by two linear relationships between $\sqrt{\sigma/\pi}$ and $A^{1/3}$. For nuclear masses up to $A^{1/3} = 3$, a "low-mass" line, which passes through the origin, was used. Above $A^{1/3} = 3$, a "high-mass" linear fit to the experimental data was used. The slope and intercepts of the "high-mass" line are determined by plotting these parameters for the experimental energies and fitting smooth curves through these plots. These parameters are shown in Fig. 5. The slope of the low-mass line is determined by plotting the shapes of lines passing through the origin and the experimental $\sqrt{\sigma/\pi}$ data for carbon, the only material for which a reasonably large number of measurements are available.

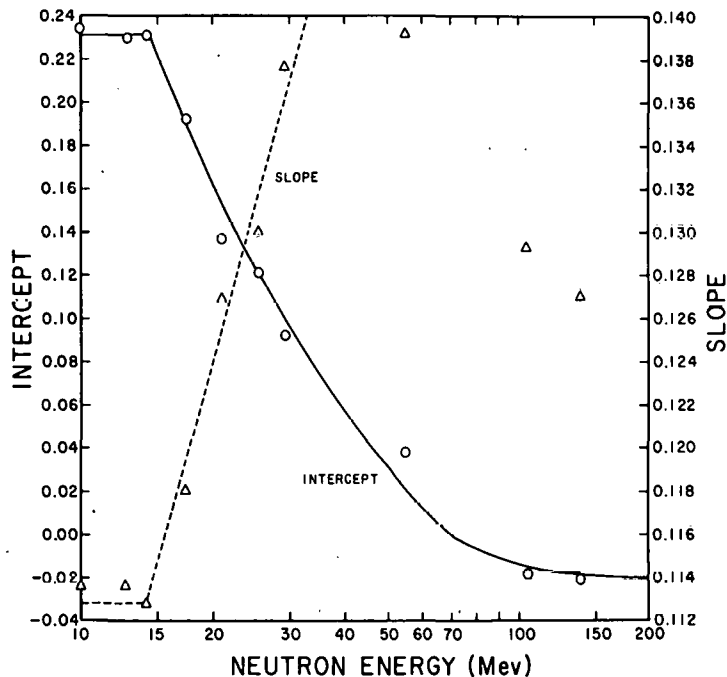


Fig. 5

Slope and Intercept for Higher Range of A. ANL Neg. No. 103-B11668.

For energies ≤ 14.2 MeV, σ_{ne} was defined by the lines

$$\sqrt{\sigma/\pi} = 0.1960A^{1/3}$$

for $0 \leq A^{1/3} \leq 2.785$, and

$$\sqrt{\sigma/\pi} = 0.2317 + 0.1128A^{1/3}$$

for $A^{1/3} \geq 2.785$.

For energies >14.2 MeV, somewhat more complicated relationships were found to be necessary, since a smooth plot was best obtained using a logarithmic plot and the intersection of the two lines was energy-dependent.

For the lower-mass range, we have (from the carbon data)

$$\sqrt{\sigma/\pi} = [0.1960 - 0.00167(E - 14.2)]A^{1/3},$$

and for the higher range,

$$\begin{aligned} \sqrt{\sigma/\pi} = & 0.2317 - 0.2189(\ln E - \ln 14.2) + 0.04777(\ln E - \ln 14.2)^2 \\ & + [0.1128 \pm 0.03263(\ln t - \ln 14.2)]A^{1/3}, \end{aligned}$$

and these intersect at

$$A^{1/3} = \frac{0.2317 - 0.2189(\ln E - \ln 14.2) + 0.04777(\ln E - \ln 14.2)^2}{0.0832 - 0.00167(E - 14.2) - 0.0326(\ln E - \ln 14.2)}$$

The movement of the point of intersection with energy is not large and, for example, at $E = 30$ MeV occurs at $A^{1/3} = 2.92$, compared with the value of 2.785 at 14.2 MeV.

These relationships should only be used up to about 30 MeV, since they do not fit well at higher energies (see Fig. 5). An illustration of the correction for the energy dependence of σ_{ne} for several nuclear masses that results from this representation is shown in Fig. 6. It can be seen that very significant corrections are involved for many nuclei. The correction is approximately linear over the most important energy range up to 20 MeV and leads to some probable nonphysical behavior. Most importantly, the correction for low-mass nuclei (illustrated by carbon) is actually less than for some higher-mass nuclei (such as aluminum). This is hardly reasonable, but it is difficult to see how an improved description could be obtained using the existing experimental data.

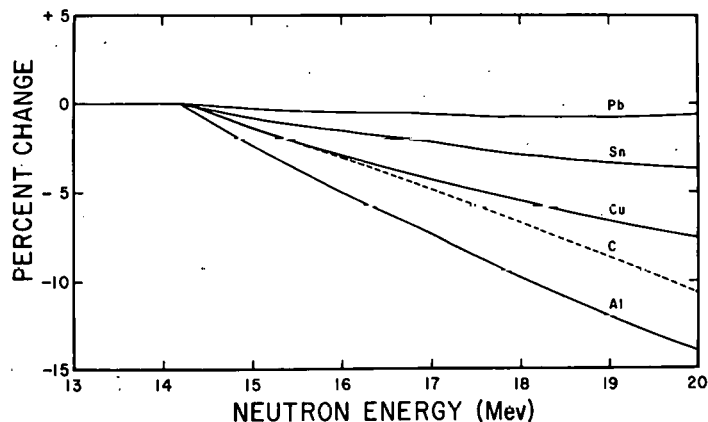


Fig. 6
Percentage Change in σ_{ne} vs
Incident Neutron Energy.
ANL Neg. No. 103-B11666.

In addition, the percentage correction per MeV decreases slightly with increasing energy (the lines of Fig. 6 are concave), whereas it might be expected that the reverse behavior would be true (lines of Fig. 6 would be convex). This detail is hardly important in view of the error that must be associated with this correction, but it is an indication that an improved description would be of value. However, for all but the lightest nuclei, the correction increases with decreasing mass (for a given energy) as expected, and overall it is not unreasonable, considering the lack of precise and detailed measurements.

We conclude that the nonelastic correction we apply is likely to be adequate for masses above about 27, but is doubtful for lower masses when the correction is large. In practice, this only affects the results for carbon, since the corrections for other elements (fluorine, sodium) are fairly small.

The method of "correcting" for the decrease in σ_{ne} at higher energies is to divide the measured $\sigma(n, 2n)$ by the ratio $\sigma_{ne}(E)/\sigma_{ne}(14.2 \text{ MeV})$. This is described in Sec. IV. The fitted curves and tables discussed in Sec. V show the effect of the "correction" for σ_{ne} in the form of the "adjusted" cross sections.

IV. DATA-FITTING PROCEDURE

A. Derivation of the Adjusted Cross Section

The measured $(n, 2n)$ cross sections above 14.2 MeV do not include effects of the variation of the compound-nucleus-formation cross section. Therefore, the measured values were corrected to reflect the "true" total $(n, 2n)$ cross sections. This correction was done by calculating $\sigma_{ne}(E)/\sigma_{ne}(14.2 \text{ MeV})$ for each measured energy value (as discussed in Sec. III) and dividing the measured $(n, 2n)$ cross section by the ratio. Below 14.2 MeV, no correction was made.

The resulting "adjusted" $(n, 2n)$ cross sections are given in each table in Appendix B, together with the measured values. The corrections were small (<20%, except for the low mass isotopes. (See comments in Sec. III.)

B. Energy Range of Fitted $\sigma(n, 2n)$ Data

All data above the $(n, 3n)$ threshold were rejected because the $(n, 3n)$ reaction competes with and thus decreases $\sigma(n, 2n)$, and this was not included in the correction formulas.

Data close to the $(n, 2n)$ threshold, E_t , were also rejected due to the great effect of errors in the measured energy data upon the fitting parameters. For all cases, data were rejected below $E_t + T$, where T (the nuclear temperature) is roughly estimated from the work of Barr, Browne, and Gilmore and was assumed to be $T = A/13$.

Having an exact value of T for this purpose is not important, since it affects very few data points, but, because of the high fractional errors, it is important to reject data close to the threshold.

This method follows the intent of the Barr, Browne, and Gilmore suggestion that the fit should be in the midportion of the energy range from the $(n, 2n)$ threshold to the $(n, 3n)$ threshold, although Barr, Browne, and Gilmore did not reject data near the $(n, 2n)$ threshold. We speculate that the rejection of data between E_t and $E_t + T$ is the primary reason that our fit of the Prestwood-Bayhurst data give a consistently better fit. (See, for example, ^{58}Ni in Appendix B.)

C. Fitting Procedure

The "corrected" $(n, 2n)$ cross-section data were fitted to expressions that describe two nuclear models as suggested by Barr, Browne, and Gilmore. The first, the constant-temperature model, is

$$\sigma(n, 2n) = \sigma_{\text{ASYM}} \left[1 - \left(1 + \frac{E_n - E_t}{T} \right) \exp \left(- \frac{E_n - E_t}{T} \right) \right], \quad (5)$$

in which the asymptotic $(n, 2n)$ cross section, σ_{ASYM} , and the nuclear temperature, T, were obtained by least-squares fitting of the corrected data.

The second formula was the level-density model in which the level-density parameter, α , was the fitting parameter rather than a constant temperature, T:

$$\sigma(n, 2n) = \sigma_{\text{ASYM}} \left\{ 1 - \left[1 + \frac{E_n - E_t}{(E_n/\alpha)^{1/2}} \right] \exp \left[- \frac{E_n - E_t}{(E_n/\alpha)^{1/2}} \right] \right\}. \quad (6)$$

The least-squares fitting was done using a generalized weighted least-squares-fitting program on the SEL 840 MP computer.* The data were weighted using the inverse square of the experimental uncertainties as weights.

V. RESULTS OF THE FITTING PROCEDURES

The detailed experimental data, the same data corrected for the variation of the nonelastic cross section, and the fitted parameters for the constant temperature fit are given in the tables and graphs of Appendix B. The equivalent data for the level-density α fit are also given in Appendix B. The results of all of these fits are summarized in Table I. In both appendixes and in Table I, the reference quoted is the listing given in Appendix A, which refers exclusively to the origins of the experimental data. The reference system

*This computer program is based upon a least-squares-fitting code developed by J. Gardner Atkinson at The University of Texas at Austin, Texas, which in turn was based upon the work in Ref. 9.

TABLE I. Summary of Data Fits

$\begin{matrix} N & X & A \\ Z & & \end{matrix}$	T Fit					α Fit			
	Ref.	T MeV (ΔT)	Mean	$\sigma_{ASYM}/\sigma_{ne}$ ($\Delta \sigma/\sigma$)	Mean	α MeV ⁻¹ ($\Delta \alpha$)	Mean	$\sigma_{ASYM}/\sigma_{ne}$ ($\Delta \sigma/\sigma$)	Mean
$\begin{matrix} 6 & C & 12 \\ 6 & & \end{matrix}$ (0.00000)	A 73	6.173 0.750	4.690 0.406	0.1008 0.0159	0.0479 0.0038	0.339 0.137	0.454 0.127	0.1685 0.0508	0.0529 0.0067
	B 61	4.409 0.541		0.0479 0.0043		1.091 0.335		0.0559 0.0076	
	B 52	2.790 1.064		0.0271 0.0100		2.427 2.143		0.0315 0.0149	
	B 65	1.729 0.075	1.738 0.070	0.0181 0.0006	0.0182 0.0006	4.005 0.463	3.938 0.416	0.0198 0.0010	0.0199 0.0009
	B 61	1.865 0.633		0.0171 0.0028		3.914 2.723		0.0181 0.0036	
	F 60	1.791 0.204		0.0192 0.0017		3.623 1.014		0.0215 0.0027	
P 60	3.613 ^a 0.684		0.0498 0.0137		0.473 ^a 0.287		0.0965 0.0477		
$\begin{matrix} 8 & O & 16 \\ 8 & & \end{matrix}$ (0.00000)	B 61	9.194 2.307		0.0666 0.0214		No Fit			
	V 68	3.689 ^a 0.323	2.770 0.084	4.5961 ^a 0.5894	0.1636 0.0061	0.414 ^a 0.117	1.063 0.104	9.4620 ^a 2.2135	0.2191 0.0147
$\begin{matrix} 10 & F & 19 \\ 9 & & \end{matrix}$ (0.05263)	M 67	2.662 0.157		0.1542 0.0105		1.309 0.242		0.2019 0.0242	
	B 65	2.895 0.127		0.1645 0.0081		1.068 0.157		0.2242 0.0213	
	P 65	1.496 ^a 0.161		0.1160 ^a 0.0057		5.752 ^a 1.281		0.1206 ^a 0.0069	
	R 63	3.371 0.357		0.2338 0.0342		0.610 0.213		0.3960 0.1072	
	B 61	2.794 0.269		0.2611 ^a 0.0235		1.353 0.343		0.3226 ^a 0.0448	
	P 60	2.252 0.248		0.1694 0.0216		1.786 0.484		0.2236 0.0396	
	M 67	1.621 0.151	1.854 0.057	0.1346 0.0094	0.1626 ^c 0.0661	5.083 1.077	3.463 0.252	0.1461 0.0129	0.1828 ^c 0.0779
	L 65	1.911 0.062		0.2885 0.0099		3.363 0.259		0.3323 0.0146	
PI 65	1.027 0.416		0.0646 0.0175		11.553 8.940		0.0701 0.0203		

TABLE I. (Contd.)

N X A Z	T Fit					a Fit				
	Ref.	T MeV (ΔT)	Mean	$\sigma_{ASYM}/\sigma_{ne}$ ($\Delta \sigma/\sigma$)	Mean	a MeV ⁻¹ (Δa)	Mean	$\sigma_{ASYM}/\sigma_{ne}$ ($\Delta \sigma/\sigma$)	Mean	
¹⁶ P ³¹ ¹⁵	B 63	1.909 0.133		0.0721 0.0048		3.439 0.506		0.0816 0.0063		
(0.03226)										
²⁰ K ³⁹ ¹⁹	A 65	3.338 1.667	2.263 0.196	0.0252 0.0188	0.0312 0.0030	0.761 1.071	2.061 0.423	0.0416 0.0476	0.0389 0.0048	
(0.02564)	B 65	2.248 0.197		0.0314 0.0030		2.301 0.460		0.0389 0.0048		
²⁴ Sc ⁴⁵ ²¹	A 64	1.063 0.059	1.420 ^C 0.358	0.3524 0.0125	0.4267 ^C 0.0743	11.102 1.434	7.424 ^C 3.678	0.3651 0.0161	0.4598 ^C 0.0947	
(0.06667)	P 61	1.778 0.084		0.5011 0.0260		3.746 0.500		0.5546 0.0428		
²⁴ Ti ⁴⁶ ²²	P 66	2.548 0.112	2.050 ^C 0.314	0.3189 0.0158	0.2626 ^C 0.0319	1.817 0.300	3.593 ^C 1.378	0.3990 0.0415	0.3121 ^C 0.0501	
(0.04348)	B 65	1.468 0.056		0.2084 0.0067		6.306 0.679		0.2253 0.0111		
	P 61	2.133 0.292		0.2606 0.0375		2.655 0.971		0.3120 0.0665		
²⁶ Cr ⁵⁰ ²⁴	B 66	1.778 0.111		0.0850 0.0045		4.129 0.493		0.0949 0.0053		
(0.04000)										
²⁸ Cr ⁵² ²⁴	B 67	1.131 0.075		0.4194 0.0186		10.374 1.688		0.4330 0.0248		
(0.07692)										
³⁰ Mn ⁵⁵ ²⁵	B 69	1.197 0.087	1.279 0.024	0.6722 0.0188	0.6855 0.0124	8.729 1.440	7.341 0.273	0.6914 0.0247	0.7043 0.0158	
(0.09091)	M 67	1.224 0.053		0.6958 0.0165		8.283 0.823		0.7133 0.0206		
	P 65	1.303 0.028		0.8592 ^a 0.0099		7.162 0.295		0.8918 ^a 0.0106		
²⁸ Fe ⁵⁴ ²⁶	B 72	1.268 0.089	1.284 0.088	0.0536 0.0034	0.0538 0.0034	8.539 1.342	4.773 0.912	0.0576 0.0043	0.0577 0.0043	
(0.03704)	A 68	2.588 0.801		0.2174 0.0903		1.548 1.242		0.3004 0.1766		

TABLE I. (Contd.)

N Z	X	A	T Fit				α Fit				
			Ref.	T MeV (ΔT)	Mean	$\sigma_{ASYM}/\sigma_{ne}$ ($\Delta \sigma/\sigma$)	Mean	α MeV ⁻¹ ($\Delta \alpha$)	Mean	$\sigma_{ASYM}/\sigma_{ne}$ ($\Delta \sigma/\sigma$)	Mean
³² Co 27	59	(0.08475)	D 68	1.175 0.037	1.190 0.014	0.5411 0.0083	0.5599 ^c 0.0126	8.697 0.617	8.622 0.156	0.5594 0.0106	0.5764 ^c 0.0142
			O 67	1.183 0.122		0.8748 ^d 0.0487		8.385 1.978		0.9254 ^d 0.0682	
			B 66	1.124 0.110		0.5703 0.0282		9.609 1.738		0.5883 0.0291	
			P 66	0.896 ^a 0.087		0.5375 0.0193		15.641 ^a 3.354		0.5475 0.0238	
			P 65	1.194 0.015		0.5908 0.0039		8.610 0.163		0.6104 0.0034	
			³⁰ Ni 28	58	(0.03448)	C 65	2.158 1.181	1.407 0.033	0.1010 ^d 0.0711	0.0473 ^c 0.0071	2.083 2.893
P 65	1.367 0.037					0.0472 0.0009		6.990 0.370		0.0502 0.0010	
J 63	2.136 0.341					0.0350 0.0036		2.940 1.051		0.0386 0.0052	
P 61	1.524 0.072					0.0596 0.0030		5.460 0.552		0.0643 0.0036	
³⁴ Cu 29	63	(0.07937)				B 69	1.565 0.080	1.767 0.017	0.6524 0.0201	0.7129 0.0053	4.847 0.466
			L 65	1.790 0.020		0.7233 0.0066		3.538 0.111		0.8037 0.0115	
			R 63	1.703 0.038		0.5127 ^a 0.0085		4.032 0.238		0.5560 ^a 0.0136	
			G 62	1.741 0.127		0.5934 0.0414		3.432 0.581		0.6980 0.0638	
			K 62	1.814 0.106		0.6385 0.0315		3.249 0.619		0.7279 0.0663	
			F 60	2.036 0.121		0.6821 0.0394		2.526 0.271		0.8064 0.0473	
			P 60	1.687 0.315		0.8683 0.1553		3.676 1.624		1.0125 0.2407	
			A 59	1.530 ^a 0.066		0.7236 0.0213		4.970 ^a 0.151		0.7827 0.0091	
			C 56	0.951 ^a 0.109		0.4041 ^a 0.0204		13.792 ^a 3.272		0.4150 ^a 0.0238	
			B 52	1.643 0.240		0.7003 0.0539		4.802 1.303		0.7384 0.0601	

TABLE I. (Contd.)

N X A Z	Ref.	T Fit				α Fit			
		T MeV (ΔT)	Mean	$\sigma_{ASYM}/\sigma_{ne}$ ($\Delta \sigma/\sigma$)	Mean	α MeV ⁻¹ ($\Delta \alpha$)	Mean	$\sigma_{ASYM}/\sigma_{ne}$ ($\Delta \sigma/\sigma$)	Mean
³⁸ Ge ⁷⁰ ₃₂	B 72	1.161	1.263	0.6318	0.6404	9.695	7.850	0.6549	0.6689
		0.071	0.034	0.0151	0.0114	1.131	0.452	0.0174	0.0136
(0.08571)	P 61	1.292		0.6520		7.499		0.6906	
		0.038		0.0175		0.493		0.0216	
⁴⁴ Ge ⁷⁶ ₃₂	S 70	1.735	1.761	0.9595	0.9595	3.297	2.792	1.0862	1.0862
		0.102	0.100	0.0589	0.0589	0.509	0.434	0.0946	0.0946
(0.15789)	O 67	2.441		1.2998 ^d		1.459		1.6798 ^d	
		0.518		0.2645		0.827		0.5450	
⁴² As ⁷⁵ ₃₃	D 71	1.269	1.286	0.8353	0.8206	7.280	7.034	0.8805	0.8575
		0.138	0.038	0.0567	0.0151	1.681	0.543	0.0701	0.0221
(0.12000)	B 68	1.346		0.8079		6.739		0.8416	
		0.063		0.0220		0.751		0.0298	
	P 61	1.248		0.8312		7.379		0.8759	
		0.052		0.0222		0.889		0.0374	
⁴⁰ Se ⁷⁴ ₃₄	B 72	1.741 ^a	1.264	0.5304 ^a	0.4526	3.928 ^a	8.180	0.6018 ^a	0.4745
		0.049	0.058	0.0130	0.0136	0.213	0.803	0.0160	0.0167
(0.08108)	A 69	1.185		0.4611		9.039		0.4906	
		0.153		0.0384		2.644		0.0517	
	B 66	1.277		0.4514		8.093		0.4726	
		0.062		0.0146		0.843		0.0177	
⁴⁴ Br ⁷⁹ ₃₅	B 67	0.804 ^a	1.160	0.6275	0.6155	19.984 ^a	8.761	0.6347	0.6304
		0.054	0.044	0.0143	0.0104	3.021	0.825	0.0174	0.0137
(0.11392)	O 67	1.195		0.7454 ^a		8.165		0.7940 ^a	
		0.087		0.0328		1.291		0.0432	
	K 60	1.148		0.6023		9.172		0.6235	
		0.051		0.0150		1.072		0.0221	
⁴⁶ Br ⁸¹ ₃₅	O 67	1.389		0.5781		5.827		0.6239	
		0.102		0.0264		0.976		0.0377	
(0.13580)									
⁴⁸ Rb ⁸⁵ ₃₇	A 72	0.998	1.124	0.7338	0.7238	12.415	9.517	0.7533	0.7375
		0.233	0.034	0.0747	0.0095	6.379	0.712	0.0931	0.0128
(0.12941)	B 72	1.070		0.7116		11.340		0.7235	
		0.057		0.0131		1.536		0.0183	
	B 67	1.142		0.7376		9.897		0.7508	
		0.049		0.0141		1.029		0.0183	
	P 61	1.232		1.0861 ^b		7.703		1.1498 ^b	
		0.112		0.0629		1.545		0.0817	
	T 60	1.243		1.2677 ^d		6.814		1.4007 ^d	
		0.209		0.1863		2.473		0.2445	

TABLE I. (Contd.)

N Z	X A	T Fit				α Fit				
		Ref.	T MeV (ΔT)	Mean	$\sigma_{ASYM}/\sigma_{ne}$ ($\Delta \sigma/\sigma$)	Mean	α MeV ⁻¹ ($\Delta \alpha$)	Mean	$\sigma_{ASYM}/\sigma_{ne}$ ($\Delta \sigma/\sigma$)	Mean
50 37	Rb ⁸⁷ (0.14943)	A 72	0.904	1.108	0.7484	0.7739	15.563	9.153	0.7571	0.7950
			0.274	0.057	0.0564	0.0207	10.351	1.094	0.0696	0.0309
		B 72	1.162		1.1365 ^a		9.456		1.1572 ^a	
			0.219		0.0880		4.155		0.1126	
	P 61	1.125		0.7779		9.404		0.8043		
		0.074		0.0223		1.631		0.0345		
	T 60	1.091		1.4624 ^a		8.715		1.5706 ^a		
		0.103		0.1047		1.596		0.1200		
46 38	Sr ⁸⁴ (0.09524)	B 66	0.992	1.013	0.9444	0.9444	13.661	11.293	0.9640	0.9640
			0.030	0.029	0.0167	0.0167	1.104	0.833	0.0239	0.0239
		P 61	1.232		0.1805 ^b		8.170		0.1935 ^b	
		0.098		0.0154		1.268		0.0168		
48 38	Sr ⁸⁶ (0.11628)	B 72	1.003		0.4606		12.818		0.4727	
			0.044		0.0108		1.072		0.0112	
50 39	Y ⁸⁹ (0.12360)	B 72	1.157	1.148	0.7155	0.6464	9.277	8.460	0.7493	0.6501
			0.052	0.032	0.0228	0.0127	1.090	0.592	0.0334	0.0147
		A 69	0.842 ^a		0.6130		18.024 ^a		0.6245	
			0.026		0.0154		1.156		0.0164	
		P 61	1.129		0.0107 ^b		9.790		0.0112 ^h	
		0.041		0.0003		0.828		0.0004		
	T 60	1.639		0.8665		3.674		1.0663		
		0.252		0.1637		1.350		0.2609		
50 40	Zr ⁹⁰ (0.11111)	K 72	1.422	1.104	1.0294	0.7183	5.293	10.398	1.2172	0.7534
			0.576	0.025	0.4914	0.0152	5.103	0.433	0.7453	0.0152
		A 69	1.161		0.7675		9.814		0.8020	
			0.115		0.0458		1.932		0.0521	
	P 61	1.101		0.7119		10.468		0.7487		
		0.026		0.0161		0.446		0.0159		
50 42	Mo ⁹² (0.08696)	B 72	2.486	1.838	0.7339	0.6702	1.675	2.258	0.9709	0.7661
			0.203	0.084	0.0712	0.0277	0.388	0.344	0.1497	0.0598
		K 72	0.799 ^a		0.1410 ^a		20.038 ^a		0.1491 ^a	
			0.086		0.0132		4.653		0.0159	
		A 69	1.600		0.3396 ^a		4.689		0.3886 ^a	
			0.200		0.0496		1.371		0.0708	
	B 52	1.734		0.6588		4.294		0.7273		
		0.103		0.0301		0.889		0.0652		
52 44	Ru ⁹⁶ (0.08333)	B 70	1.191		0.5825		8.745		0.6015	
			0.059		0.0141		1.062		0.0194	

TABLE I. (Contd.)

$\begin{matrix} N & X & A \\ Z & & \end{matrix}$	Ref.	T Fit				α Fit			
		T MeV (ΔT)	Mean	$\frac{\sigma_{ASYM}}{\sigma_{ne}}$ ($\Delta \sigma/\sigma$)	Mean	α MeV ⁻¹ ($\Delta \alpha$)	Mean	$\frac{\sigma_{ASYM}}{\sigma_{ne}}$ ($\Delta \sigma/\sigma$)	Mean
$\begin{matrix} 60 \\ 44 \end{matrix} Ru^{104}$	B 70	1.072 0.089		0.8550 0.0205		10.144 1.867		0.8727 0.0268	
(0.15385)									
$\begin{matrix} 58 \\ 45 \end{matrix} Rh^{103}$	P 70	0.938 0.067	1.142 0.033	0.5636 0.0097	0.5115 ^c 0.0521	12.990 1.899	6.960 0.491	0.5731 0.0117	0.5371 ^c 0.0360
(0.12621)	T 60	1.208 0.038		0.4594 0.0119		6.528 0.508		0.5011 0.0177	
$\begin{matrix} 56 \\ 46 \end{matrix} Pd^{102}$	B 70	1.082 0.073		0.6215 0.0183		10.594 1.621		0.6358 0.0229	
(0.09804)									
$\begin{matrix} 64 \\ 46 \end{matrix} Pd^{110}$	B 70	1.186 0.097		0.8510 0.0275		7.854 1.271		0.8833 0.0332	
(0.16364)									
$\begin{matrix} 58 \\ 48 \end{matrix} Cd^{106}$	B 68	1.017 0.085	1.083 0.074	0.8587 0.0333	0.7281 ^c 0.1306	12.464 2.261	9.271 1.417	0.8719 0.0385	0.7522 ^c 0.1196
(0.09434)	R 63	1.286 0.149		0.5976 0.0504		7.206 1.818		0.6326 0.0630	
$\begin{matrix} 68 \\ 48 \end{matrix} Cd^{116}$	P 61	0.933 0.076		0.8685 0.0121		13.224 2.362		0.8795 0.0160	
(0.17241)									
$\begin{matrix} 64 \\ 49 \end{matrix} In^{113}$	G 70	1.159 0.220		0.8777 0.0427		9.254 3.936		0.8962 0.0582	
(0.13274)									
$\begin{matrix} 66 \\ 49 \end{matrix} In^{115}$	G 70	1.021 0.161		0.9236 0.0294		12.047 4.273		0.9331 0.0376	
(0.14783)									
$\begin{matrix} 62 \\ 50 \end{matrix} Sn^{112}$	B 68	0.945 0.043	0.991 0.035	0.6796 0.0131	0.6837 0.0124	14.267 1.605	10.798 0.894	0.6894 0.0175	0.6952 0.0164
(0.10714)	R 63	1.172 0.075		1.0294 ^a 0.0388		8.779 1.115		1.0739 ^a 0.0439	
	P 61	0.900 0.111		0.7218 0.0397		15.480 4.110		0.7387 0.0478	
$\begin{matrix} 70 \\ 51 \end{matrix} Sb^{121}$	B 68	1.354 0.078	1.325 0.069	0.9529 0.0239	0.8915 0.0193	6.281 0.742	6.463 0.701	0.9941 0.0297	0.9330 0.0245
(0.15702)	P 60	1.215 0.151		0.7773 0.0326		7.958 2.129		0.8030 0.0433	
$\begin{matrix} 72 \\ 51 \end{matrix} Sb^{123}$	B 68	1.220 0.103	1.163 0.087	0.7030 0.0206	0.6846 0.0152	7.783 1.469	8.228 1.369	0.7244 0.0278	0.7016 0.0205
(0.17073)	P 61	1.025 0.161		0.6624 0.0226		11.155 3.770		0.6748 0.0302	

TABLE I. (Contd.)

N Z	X A	T Fit				α Fit				
		Ref.	T MeV (ΔT)	Mean	$\sigma_{ASYM}/\sigma_{ne}$ ($\Delta \sigma/\sigma$)	Mean	α MeV ⁻¹ ($\Delta \alpha$)	Mean	$\sigma_{ASYM}/\sigma_{ne}$ ($\Delta \sigma/\sigma$)	Mean
76 52	Te ¹²⁸	B 70	1.462		1.0101		4.903		1.0824	
			0.122		0.0465		1.052		0.0758	
(0.18750)										
78 52	Te ¹³⁰	B 70	1.271		0.9582		6.811		0.9939	
			0.159		0.0461		2.042		0.0676	
(0.20000)										
74 53	I ¹²⁷	B 72	1.530	1.306	0.8286	0.7028	4.638	5.696	0.8873	0.7288
			0.187	0.064	0.0601	0.0085	1.200	0.716	0.0783	0.0160
(0.16535)										
		B 62	1.065		0.6770		10.736		0.6883	
			0.118		0.0192		2.887		0.0274	
		M 53	1.383		0.7061		5.811		0.7405	
			0.084		0.0096		0.937		0.0204	
78 55	Cs ¹³³	B 72	1.687	1.687	0.7909	0.6921 ^c	3.688	3.688	0.8632	0.7282 ^c
			0.065	0.065	0.0192	0.0988	0.254	0.254	0.0219	0.1350
(0.17293)										
		B 62	0.654		0.5933		11.664		0.5932	
			3.530		0.0463		542.5		0.0470	
82 58	Ce ¹⁴⁰	B 68	1.232		0.9550		7.893		0.9808	
			0.079		0.0213		1.139		0.0282	
(0.17143)										
82 59	Pr ¹⁴¹	B 68	1.228	1.188	0.8886	0.8735	7.894	8.194	0.9145	0.8976
			0.106	0.063	0.0277	0.0186	1.348	0.929	0.0323	0.0227
(0.16312)										
		F 60	1.199		0.8069		8.135		0.8302	
			0.139		0.0371		1.976		0.0448	
		K 60	1.151		0.9066		8.703		0.9332	
			0.094		0.0339		1.683		0.0452	
82 60	Nd ¹⁴²	B 70	1.282		0.8618		7.339		0.8922	
			0.055		0.0156		0.655		0.0192	
(0.15493)										
82 62	Sm ¹⁴⁴	B 68	1.370	1.405	0.8843	0.8937	6.462	5.617	0.9259	0.9395
			0.061	0.057	0.0231	0.0220	0.706	0.570	0.0328	0.0314
(0.13889)										
		R 63	1.667		0.9856		4.042		1.0857	
			0.168		0.0723		0.964		0.1074	
100 69	Tm ¹⁶⁹	T 60	1.122		0.4501		7.225		0.4751	
			0.066		0.0163		1.065		0.0240	
(0.18343)										
120 78	Pt ¹⁹⁸	B 70	No Fit		No Fit		6.089		1.0124	
							0.373		0.0121	
(0.21212)										

TABLE I. (Contd.)

N Z X A	Ref.	T Fit				α Fit			
		T MeV (ΔT)	Mean	$\sigma_{ASYM}/\sigma_{ne}$ (Δσ/σ)	Mean	α MeV ⁻¹ (Δα)	Mean	$\sigma_{ASYM}/\sigma_{ne}$ (Δσ/σ)	Mean
¹¹⁸ ₇₉ Au ¹⁹⁷ (0.19797)	T 60	1.787 0.149		1.1051 0.0928		2.215 0.524		1.3910 0.1910	
¹²² ₈₁ Tl ²⁰³ (0.20197)	T 60	2.283 0.270		0.8284 0.1113		1.155 0.421		1.1842 0.2852	
¹²² ₈₂ Pb ²⁰⁴ (0.19608)	I 65	1.027 0.156	1.584 0.106	0.6979 0.0432	0.8086 ^c 0.1107	9.331 2.937	1.827 0.250	0.7272 0.0548	^c
	T 60	2.059 0.144		0.9193 0.0500		1.772 0.251		1.1769 0.0839	
¹⁴² ₉₀ Th ²³² (0.22414)	BU 61	0.703 0.027	0.703 0.027	0.7392 0.0205	0.7287 0.0192	14.051 1.410	14.080 1.389	0.7747 0.0303	0.7567 0.0276
	T 60	0.716 0.191		0.6507 0.0558		15.048 8.133		0.6683 0.0671	
¹⁴⁶ ₉₂ U ²³⁸ (0.22689)	K 66	0.770 0.051		0.6454 0.0394		10.602 1.685		0.6978 0.0542	

^aNot included in mean. Greater than 3 σ from mean for either T or α fit.

^bNot included in mean. Relative measurement only.

^cSimple mean used. Measurements not consistent with weighted mean.

^dNot included in simple mean.

adopted is to use the initial letter of the first author and the last two digits of the year of publication for easy reference.

In Table I, we list each individual measurement of the two output parameters for both the T and α fits, and where there is more than one measurement, we have generally derived a best-mean value for each isotope. As far as possible, we have attempted to derive weighted mean values using the reciprocals of the squares of derived errors as weights. We have also attempted to use objective, statistical judgments on acceptance or rejection of an individual measurement on the basis of deviation by less or more than three standard deviations from the weighted mean of the remainder of the data. These attempts have met with reasonable, but not complete, success, and we should state clearly that the error assessment and selection of the best values is not, and cannot, be made on a completely objective basis. Some subjective judgments are inevitable because of inconsistencies between quoted errors and spreads of data, but we believe that these are of minor importance in the overall picture.

Where the quoted errors are not consistent with a weighted mean, and there is no obvious correction by rejection of a measurement, we have usually adopted a simple arithmetic mean and assessed the error on the basis of the spread of the measurements. This is a conservative measure, since the error on the mean is usually larger than where a weighted mean is used. In general, we find that the spreads of T and α are reasonably consistent with the individual errors, and weighted means can be used. This is expected, since it is reasonable that the shapes of the cross-section curves would not be subject to great error. By contrast, this is less true for the cross-section ratio, $\sigma_{ASYM}/\sigma_{ne}$, and again this is as expected, since the accuracy of these data depends upon the more difficult absolute measurement of cross sections.

VI. SYSTEMATICS OF $\sigma_{ASYM}/\sigma_{ne}$

As discussed in Sec. II, Barr, Browne, and Gilmore discovered that the ratio of the asymptotic $(n, 2n)$ cross section to the nonelastic cross section ($\sigma_{ASYM}/\sigma_{ne}$) was smoothly dependent upon the neutron asymmetry parameter $(N - Z)/A$ and was well represented by a function of the form

$$\sigma_{ASYM}/\sigma_{ne} = 1 - A \exp\left[-B\left(\frac{N - Z}{A}\right)\right] \quad (7)$$

shown in Fig. 3. Accordingly, we have examined the data derived in the present work to see if they support this conclusion.

In Table II we have summarized the relevant data of Table I, ordered in terms of increasing values of $(N - Z)/A$. In addition to the data taken from Table I, we have also listed the actual number of individual measurements used in obtaining the quoted value together with an "effective" number. The latter is the actual number when all the measurements contribute approximately equally toward the mean, but where measurements are of widely varying accuracy, it is the smaller number of values whose relative weight is sufficiently high that they alone contribute effectively to determining the mean. These "effective" numbers are only approximate quantities, but since they are only used as weighting parameters for certain fitting procedures, exact values are not of great importance.

These experimental data are shown in Figs. 7 and 8, and it can be seen that they do indeed follow curves of the general form of Eq. 7. Some of the data lie well away from the general trend, and these data points can reasonably be considered to be probably in error, due to the difficulty in making the necessary absolute cross-section measurements. In some instances (but not all), good supportive evidence for this contention can be made. For example, some relevant measurements were made at energies near 14 MeV by Mather et al.¹⁰ These are of the direct neutron-emission cross section (and thus not subject to decay-scheme uncertainties in the active isotope) and have good internal consistency, and they indicate that the Rh¹⁰³ and Tm¹⁶⁹ data given in Table II are too low and should be scaled up to values in the range 0.8-0.9.

TABLE II. $\sigma_{ASYM}/\sigma_{ne}$ vs $(N - Z)/A$ for T and α Fits

$\frac{N-Z}{A}$	Isotope	T Fit Data			α Fit Data			Comment (See Footnotes)
		σ/σ	Error	Number Meas. Actual/Eff.	σ/σ	Error	Number Meas. Actual/Eff.	
0.00000	C ¹²	0.0479	0.0038	3/1	0.0529	0.0067	3/1	
0.00000	N ¹⁴	0.0182	0.0006	4/3	0.0199	0.0009	4/3	
0.00000	O ¹⁶	0.0666	0.0214	1/1	No Fit		0/0	
0.02564	K ³⁹	0.0312	0.0030	2/1	0.0389	0.0048	2/1	
0.03226	P ³¹	0.0721	0.0048	1/1	0.0816	0.0063	1/1	
0.03448	Ni ⁵⁸	0.0473	0.0071	3/3	0.0510	0.0074	3/3	
0.03704	Fe ⁵⁴	0.0538	0.0034	2/1	0.0577	0.0043	2/1	
0.04000	Cr ⁵⁰	0.0850	0.0045	1/1	0.0949	0.0053	1/1	
0.04348	Na ²³	0.1626	0.0661	3/3	0.1828	0.0779	3/3	
0.04348	Ti ⁴⁶	0.2626	0.0319	3/3	0.3121	0.0501	3/3	
0.05263	F ¹⁹	0.1636	0.0061	4/3	0.2191	0.0147	4/3	
0.06250	Zn ⁶⁴	0.4004	0.0308	5/3	0.4999	0.0398	5/3	
0.06667	Sc ⁴⁵	0.4267	0.0743	2/2	0.4598	0.0947	2/2	
0.07692	Cr ⁵²	0.4194	0.0186	1/1	0.4330	0.0248	1/1	
0.07937	Cu ⁶³	0.7129	0.0053	8/3	0.7823	0.0066	8/3	
0.08108	Se ⁷⁴	0.4526	0.0136	2/2	0.4745	0.0167	2/2	
0.08333	Ru ⁹⁶	0.5825	0.0141	1/1	0.6015	0.0194	1/1	
0.08475	Co ⁵⁹	0.5599	0.0126	4/4	0.5764	0.0142	4/4	
0.08571	Ge ⁷⁰	0.6404	0.0114	2/2	0.6689	0.0136	2/2	
0.08696	Mo ⁹²	0.6702	0.0277	2/2	0.7661	0.0598	2/2	
0.09091	Mn ⁵⁵	0.6855	0.0124	2/2	0.7043	0.0158	2/2	
0.09091	Zn ⁶⁶	0.8333	0.0153	1/1	0.8758	0.0173	1/1	
0.09434	Cd ¹⁰⁶	0.7281	0.1306	2/2	0.7522	0.1196	2/2	
0.09524	Sr ⁸⁴	0.9444	0.0167	1/1	0.9640	0.0239	1/1	
0.09804	Pd ¹⁰²	0.6215	0.0183	1/1	0.6358	0.0229	1/1	
0.10145	Ga ⁶⁹	0.8458	0.0267	1/1	0.8856	0.0321	1/1	
0.10714	Sn ¹¹²	0.6837	0.0124	2/2	0.6952	0.0164	2/2	
0.10769	Cu ⁶⁵	0.7072	0.0181	6/6	0.7247	0.0230	6/6	
0.11111	Zr ⁹⁰	0.7183	0.0152	3/2	0.7534	0.0152	3/2	
0.11392	Br ⁷⁹	0.6155	0.0104	2/2	0.6304	0.0137	2/2	
0.11628	Sr ⁸⁶	0.4606	0.0108	1/1	0.4727	0.0112	1/1	
0.12000	As ⁷⁵	0.8206	0.0151	3/2	0.8575	0.0221	3/2	

TABLE II. (Contd.)

N-Z	Isotope	T Fit Data			α Fit Data			Comment (See Footnotes)
		σ/σ	Error	Number Meas. Actual/Eff.	σ/σ	Error	Number Meas. Actual/Eff.	
0.12360	Y ⁸⁹	0.6464	0.0127	3/2	0.6501	0.0147	3/2	
0.12621	Rh ¹⁰³	0.5115	0.0521	2/2	0.5371	0.0360	2/2	a
0.12676	Ga ⁷¹	0.7603	0.0096	1/1	0.7642	0.0118	1/1	
0.12941	Rb ⁸⁵	0.7238	0.0095	3/2	0.7375	0.0128	3/2	
0.13274	In ¹¹³	0.8777	0.0427	1/1	0.8962	0.0582	1/1	
0.13580	Br ⁸¹	0.5781	0.0264	1/1	0.6239	0.0377	1/1	
0.13889	Sm ¹⁴⁴	0.8937	0.0220	2/1	0.9395	0.0314	2/1	
0.14783	In ¹¹⁵	0.9236	0.0294	1/1	0.9331	0.0376	1/1	
0.14943	Rb ⁸⁷	0.7739	0.0207	2/1	0.7950	0.0309	2/1	
0.15385	Ru ¹⁰⁴	0.8550	0.0205	1/1	0.8727	0.0268	1/1	
0.15493	Nd ¹⁴²	0.8618	0.0156	1/1	0.8922	0.0192	1/1	
0.15702	Sb ¹²¹	0.8915	0.0193	2/2	0.9330	0.0245	2/2	
0.15789	Ge ⁷⁶	0.9595	0.0589	1/1	1.0862	0.0946	1/1	
0.16312	Pr ¹⁴¹	0.8735	0.0186	3/3	0.8976	0.0227	3/3	
0.16364	Pd ¹¹⁰	0.8510	0.0275	1/1	0.8833	0.0332	1/1	
0.16535	I ¹²⁷	0.7028	0.0085	3/2	0.7288	0.0160	3/2	
0.17073	Sb ¹²³	0.6846	0.0152	2/2	0.7016	0.0205	2/2	
0.17143	Ce ¹⁴⁰	0.9550	0.0213	1/1	0.9808	0.0282	1/1	
0.17241	Cd ¹¹⁶	0.8685	0.0121	1/1	0.8795	0.0160	1/1	
0.17293	Cs ¹³³	0.6921	0.0988	2/2	0.7282	0.1350	2/2	
0.18343	Tm ¹⁶⁹	0.4501	0.0163	1/1	0.4751	0.0240	1/1	a
0.18750	Te ¹²⁸	1.0101	0.0465	1/1	1.0824	0.0758	1/1	
0.19608	Pb ²⁰⁴	0.8086	0.1107	2/2	0.9520	0.2249	2/2	
0.19797	Au ¹⁹⁷	1.1051	0.0928	1/1	1.3910	0.1910	1/1	
0.20000	Te ¹³⁰	0.9582	0.0461	1/1	0.9939	0.0676	1/1	
0.20197	Tl ²⁰³	0.8284	0.1113	1/1	1.1842	0.2852	1/1	
0.21212	Pt ¹⁹⁸	No Fit		0/0	1.0124	0.0121	1/1	
0.22414	Th ²³²	0.7287	0.0192	2/1	0.7567	0.0276	2/1	b
0.22689	U ²³⁸	0.6454	0.0394	1/1	0.6978	0.0542	1/1	b

^a Direct neutron-emission measurements near 14 MeV indicate that these activation measurements are too low and should be disregarded (see Text).

^b The asymptotic cross section does not include the competitive (n,n'f) reaction and the ratios rise to about 0.9 if these are added (see Text).

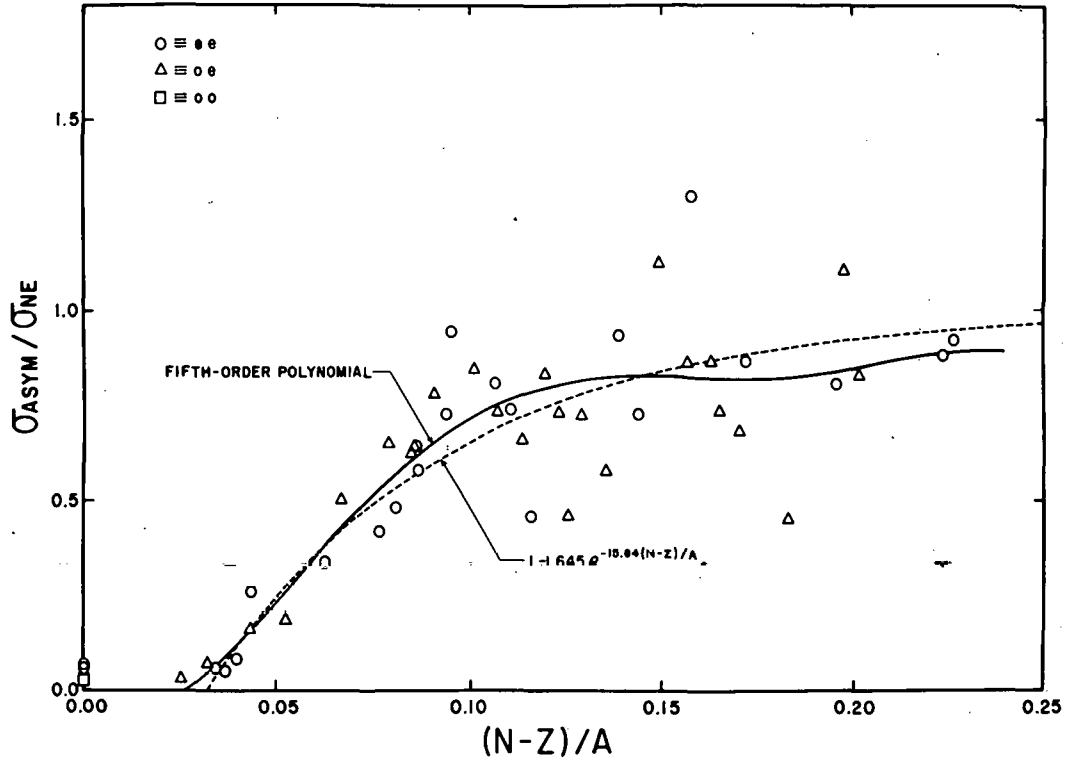


Fig. 7. $\sigma_{ASYM}/\sigma_{ne}$ vs $(N-Z)/A$ for T Fit. ANL Neg. No. 103-B11675.

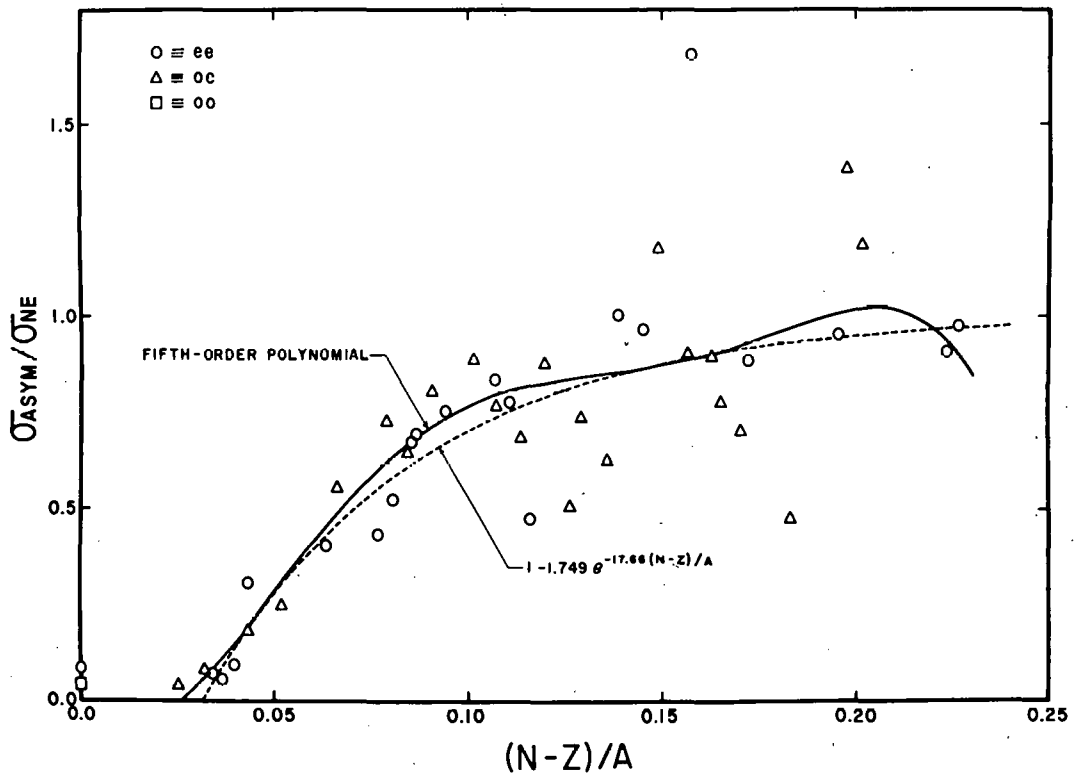


Fig. 8. $\sigma_{ASYM}/\sigma_{ne}$ vs $(N-Z)/A$ for α Fit. ANL Neg. No. 103-B11674.

In addition, for the fissionable isotopes Th^{232} and U^{238} , the data quoted in Table II are exclusively for the $(n, 2n)$ reaction and do not allow for the effect of the competitive $(n, n'f)$ reaction (which, of course, does not occur in the other isotopes). The magnitude of the cross sections for these reactions cannot be obtained accurately, but an estimate can be made by extrapolating the (n, f) reaction data below the $(n, n'f)$ threshold and subtracting this from the total fission cross section. In this way, $\sigma(n, n'f)$ for Th^{232} and U^{238} were estimated to be about 0.5b and 0.75b, respectively. Addition of these values to $\sigma(n, 2n)$ gives $\sigma_{\text{ASYM}}/\sigma_{\text{ne}}$ ratios of about 0.9 for both isotopes.

The "best" variation of $\sigma_{\text{ASYM}}/\sigma_{\text{ne}}$ with $(N - Z)/A$ was obtained for both T and α fits using both polynomial functions and the form of Eq. 7. The polynomial form was used first because it is the most objective fit to the data, but it has the disadvantage of possibly introducing fluctuations in the fitted curve that are not real. In all instances, the cases that were believed to be inapplicable (that is, Rh^{103} , Tm^{169} , Th^{232} , and U^{238}) were excluded from the fits.

Two forms of weighting the data were used: first, the assigned errors, and second, the effective number of measurements that contributed to each point. This procedure was adopted because the assigned errors are frequently likely to be inaccurate, and the alternative weighting assumes that all individual measurements are of equal accuracy. Hopefully, the choice of weights is not too important, and this is seen to be the case here. The final fits chosen here were made on the basis of the assigned errors.

As can be seen from Figs. 7 and 8, the data are consistent with a constant value of $\sigma_{\text{ASYM}}/\sigma_{\text{ne}}$ for $(N - Z)/A$ values below about 0.035, but the lack of data between 0.00 and 0.025 does not allow the curve to be defined in this region. Also, as discussed in Sec. VII, the correction for the decrease in σ_{ne} with increasing energy is so large for the nuclei of low mass that the data for C^{12} , N^{14} , and O^{16} are not believed to be accurate, although there is little doubt that the values given in Table II for these isotopes are approximately correct. For this reason, the data were fitted excluding the values at zero $(N - Z)/A$.

Significantly better fits were obtained when the one additional lowest $(N - Z)/A$ point (K^{39}) was also rejected; this is some indication that the smooth correlation deviates at the very lowest values of the neutron excess parameter. The data for K^{39} were not included in the best fits. Polynomials of increasing order were fitted, and the fit improved up to the fifth order, at which a good fit was obtained. Even with the fifth-order fit, some fluctuations are observed at high $(N - Z)/A$ that are attributable to only a few experimental points, and are probably not real, while higher-order fits produced even larger effects.

The best fits of the form of Barr, Browne, and Gilmore were

$$\frac{\sigma_{\text{ASYM}}}{\sigma_{\text{ne}}} = 1 - (1.645 \pm 0.084) \exp \left[-(15.64 \pm 1.09) \frac{N - Z}{A} \right] \quad (8)$$

for the T fit, and

$$\frac{\sigma_{\text{ASYM}}}{\sigma_{\text{ne}}} = 1 - (1.749 \pm 0.104) \exp \left[-(17.66 \pm 1.33) \frac{N - Z}{A} \right] \quad (9)$$

for the α fit. The coefficients for the latter fit are close to those obtained for Barr, Browne, and Gilmore (Eq. 3).

These are in good agreement with the polynomial fits (Figs. 7 and 8) and are, we believe, the best definitions of the variation of $\sigma_{\text{ASYM}}/\sigma_{\text{ne}}$ obtainable from the existing data. We believe that the experimental points that deviate greatly from these curves are most probably the result of experimental errors, but the only way to determine this is to obtain more accurate experimental data. Clearly, the accuracy of the fitted curves cannot be estimated with any reliability, but we believe there is no strong evidence that deviations from the smooth variation of $\sigma_{\text{ASYM}}/\sigma_{\text{ne}}$ with $(N - Z)/A$ are larger than the experimental errors.

Some indication of the relative quality of the T and α fits can be inferred from these data. Examination of the $\sigma_{\text{ASYM}}/\sigma_{\text{ne}}$ data in Tables I and II shows that, when more than one measurement has been made, the spread of these values is always larger for α fits than for T fits. Similarly, the assigned errors for α fits in Table II are always larger than for T fits. The clear implication is that the constant-temperature model gives a better fit than the level-density formulation used here, but both functions fit the experimental data within the errors.

VII. SYSTEMATICS OF T AND α DATA

In order to examine the systematics of the T and α parameters, we have assembled the best values of these data in Table III. These are taken from Table I and are the weighted or arithmetic means where more than one measurement is applicable, and are the single result where this is all that is available.

The derived quantities $T\sqrt{A}$ and α/A (where A is the mass number of the target nucleus) are also given in Table III, since these quantities might be expected to be constant if statistical models of the nuclei are applicable.

Data for the lightest nuclei--C¹², N¹⁴, and O¹⁶--have not been included because we believe that the allowance for the energy variation of the nonelastic cross section is so large that the derived parameters are poorly established.

TABLE III. Systematics of T and α Parameters^a

Isotope N X A Z	Magic Number (N or Z)	T Fit				α Fit			
		T (MeV)	ΔT	$T\sqrt{A}$	$\Delta T\sqrt{A}$	α (MeV ⁻¹)	$\Delta\alpha$	α/A	$\Delta\alpha/A$
¹⁰ ₉ F ¹⁹		2.770	0.084	12.07	0.37	1.063	0.104	0.0559	0.0055
¹² ₁₁ Na ²³		1.854	0.057	8.89	0.27	3.463	0.252	0.1505	0.0109
¹⁶ ₁₅ P ³¹		1.909	0.133	10.63	0.74	3.439	0.506	0.1109	0.0163
²⁰ ₁₉ K ³⁹	N 20	2.263	0.196	14.13	1.22	2.061	0.423	0.0528	0.0108
²⁴ ₂₁ Sc ⁴⁵		1.420	0.358	9.53	2.40	7.424	3.678	0.1650	0.0817
²⁴ ₂₂ Ti ⁴⁶		2.050	0.314	13.90	2.13	3.593	1.378	0.0781	0.0300
²⁶ ₂₄ Cr ⁵⁰		1.778	0.111	12.57	0.78	4.129	0.493	0.0826	0.0099
²⁸ ₂₄ Cr ⁵²	N 28	1.131	0.075	8.16	0.54	10.374	1.688	0.1995	0.0325
³⁰ ₂₅ Mn ⁵⁵		1.279	0.024	9.49	0.18	7.341	0.273	0.1334	0.0050
²⁸ ₂₆ Fe ⁵⁴	N 28	1.284	0.088	9.44	0.65	4.773	0.912	0.0884	0.0169
³² ₂₇ Co ⁵⁹		1.190	0.014	9.14	0.11	8.622	0.156	0.1461	0.0026
³⁰ ₂₈ Ni ⁵⁸	Z 28	1.407	0.033	10.72	0.25	6.191	0.294	0.1067	0.0051
³⁴ ₂₉ Cu ⁶³		1.767	0.017	14.03	0.13	3.544	0.090	0.0563	0.0014
³⁶ ₂₉ Cu ⁶⁵		1.305	0.015	10.52	0.12	6.847	0.212	0.1053	0.0033
³⁴ ₃₀ Zn ⁶⁴		2.307	0.032	18.46	0.26	1.888	0.081	0.0295	0.0013
³⁶ ₃₀ Zn ⁶⁶		1.427	0.052	11.59	0.42	6.326	0.434	0.0958	0.0066
³⁸ ₃₁ Ga ⁶⁹		1.401	0.080	11.64	0.66	6.192	0.731	0.0897	0.0106
⁴⁰ ₃₁ Ga ⁷¹		0.837	0.085	7.05	0.72	18.383	4.070	0.2589	0.0573
³⁸ ₃₂ Ge ⁷⁰		1.263	0.034	10.57	0.28	7.850	0.452	0.1121	0.0065
⁴⁴ ₃₂ Ge ⁷⁶		1.761	0.100	15.35	0.87	2.792	0.434	0.0367	0.0057
⁴² ₃₃ As ⁷⁵		1.286	0.038	11.13	0.33	7.034	0.543	0.0938	0.0072
⁴⁰ ₃₄ Se ⁷⁴		1.264	0.058	10.87	0.50	8.180	0.803	0.1105	0.0109
⁴⁴ ₃₅ Br ⁷⁹		1.160	0.044	10.31	0.39	8.761	0.825	0.1109	0.0104
⁴⁶ ₃₅ Br ⁸¹		1.389	0.102	12.50	0.92	5.827	0.976	0.0719	0.0120
⁴⁸ ₃₇ Rb ⁸⁵		1.124	0.034	10.36	0.31	9.517	0.712	0.1120	0.0084
⁵⁰ ₃₇ Rb ⁸⁷	N 50	1.108	0.057	10.33	0.53	9.153	1.094	0.1052	0.0125
⁴⁶ ₃₈ Sr ⁸⁴		1.013	0.029	9.28	0.27	11.293	0.833	0.1344	0.0099
⁴⁸ ₃₈ Sr ⁸⁶		1.003	0.044	9.30	0.41	12.818	1.072	0.1490	0.0125
⁵⁰ ₃₉ Y ⁸⁹	N 50	1.148	0.032	10.83	0.30	8.460	0.592	0.0951	0.0067
⁵⁰ ₄₀ Zr ⁹⁰	N 50	1.104	0.025	10.47	0.24	10.398	0.433	0.1155	0.0048
⁵⁰ ₄₂ Mo ⁹²	N 50	1.838	0.084	17.63	0.81	2.258	0.344	0.0245	0.0037

TABLE III. (Contd.)

Isotope N X A Z X	Magic Number (N or Z)	T Fit				a Fit			
		T (MeV)	ΔT	$T\sqrt{A}$	$\Delta T\sqrt{A}$	a (MeV ⁻¹)	Δa	a/A	$\Delta a/A$
⁵² ₄₄ Ru ⁹⁶		1.191	0.059	11.67	0.58	8.745	1.062	0.0911	0.0111
⁶⁰ ₄₄ Ru ¹⁰⁴		1.072	0.089	10.93	0.91	10.144	1.867	0.0975	0.0180
⁵⁸ ₄₅ Rh ¹⁰³		1.142	0.033	11.59	0.33	6.960	0.491	0.0675	0.0048
⁵⁶ ₄₆ Pd ¹⁰²		1.082	0.073	10.93	0.74	10.594	1.621	0.1039	0.0159
⁶⁴ ₄₆ Pd ¹¹⁰		1.186	0.097	12.44	1.02	7.854	1.271	0.0714	0.0116
⁵⁸ ₄₈ Cd ¹⁰⁶		1.083	0.074	11.15	0.76	9.271	1.417	0.0875	0.0134
⁶⁸ ₄₈ Cd ¹¹⁶		0.933	0.076	10.05	0.82	13.224	2.362	0.1140	0.0204
⁶⁴ ₄₉ In ¹¹³		1.159	0.220	12.32	2.34	9.254	3.936	0.0819	0.0348
⁶⁶ ₄₉ In ¹¹⁵		1.021	0.161	10.95	1.73	12.047	4.273	0.1048	0.0372
⁶² ₅₀ Sn ¹¹²	Z 50	0.991	0.035	10.49	0.37	10.798	0.894	0.0964	0.0080
⁷⁰ ₅₁ Sb ¹²¹		1.325	0.069	14.58	0.76	6.463	0.701	0.0534	0.0058
⁷² ₅₁ Sb ¹²³		1.163	0.087	12.90	0.96	8.228	1.369	0.0669	0.0111
⁷⁶ ₅₂ Te ¹²⁸		1.462	0.122	16.54	1.38	4.903	1.052	0.0383	0.0082
⁷⁸ ₅₂ Te ¹³⁰		1.271	0.159	14.49	1.81	6.811	2.042	0.0542	0.0157
⁷⁴ ₅₃ I ¹²⁷		1.306	0.064	14.72	0.72	5.696	0.716	0.0449	0.0056
⁷⁸ ₅₅ Cs ¹³³		1.687	0.065	19.46	0.75	3.688	0.254	0.0277	0.0019
⁸² ₅₈ Ce ¹⁴⁰	N 82	1.232	0.079	14.58	0.93	7.893	1.139	0.0564	0.0081
⁸² ₅₉ Pr ¹⁴¹	N 82	1.188	0.063	14.11	0.75	8.194	0.929	0.0581	0.0066
⁸² ₆₀ Nd ¹⁴²	N 82	1.282	0.055	15.28	0.66	7.339	0.655	0.0517	0.0046
⁸² ₆₂ Sm ¹⁴⁴	N 82	1.405	0.057	16.86	0.68	5.617	0.570	0.0390	0.0040
¹⁰⁰ ₆₉ Tm ¹⁶⁹		1.122	0.066	14.59	0.86	7.225	1.065	0.0428	0.0063
¹²⁰ ₇₈ Pt ¹⁹⁸		No Fit		No Fit		6.089	0.373	0.0308	0.0019
¹¹⁸ ₇₉ Au ¹⁹⁷		1.787	0.149	25.08	2.09	2.215	0.524	0.0112	0.0027
¹²² ₈₁ Tl ²⁰³		2.283	0.270	32.53	3.85	1.155	0.421	0.0057	0.0021
¹²² ₈₂ Pb ²⁰⁴	Z 82	1.584	0.106	22.62	1.51	1.827	0.250	0.0090	0.0012

^aC¹², N¹⁴, O¹⁶, Th²³², and U²³⁸ data are excluded; see Text.

Data have also been excluded for Th²³² and U²³⁸, since the (n, n'f) reaction is competitive with the (n, 2n) reaction for these nuclei; thus the analysis of the (n, 2n) reaction alone for these nuclei cannot be expected to yield parameters consistent with those for nuclei where the fission reaction does not occur.

The data of Table III are displayed in different ways in the graphs of Figs. 9 and 10 and the histograms of Figs. 11 and 12. In Figs. 9 and 10, the errors have been omitted for clarity, but are generally smaller than the spread of the data points (see Table III).

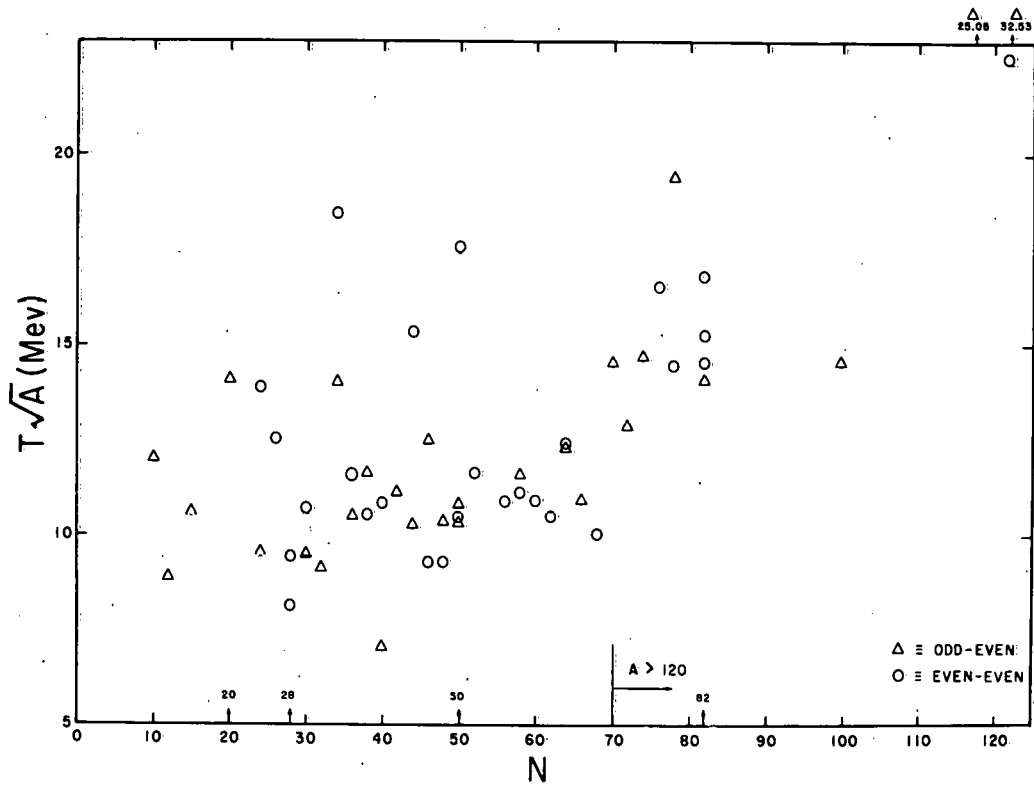


Fig. 9. $T\sqrt{A}$ vs N . ANL Neg. No. 103-B11670.

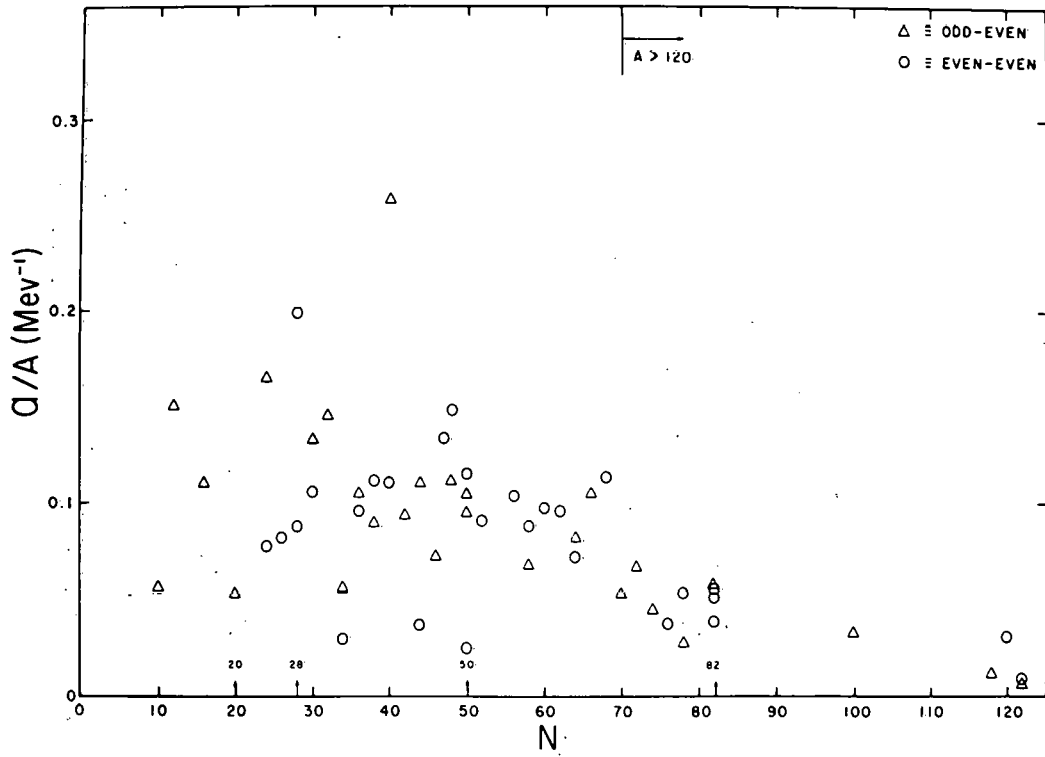


Fig. 10. α/A vs N . ANL Neg. No. 103-B11671.

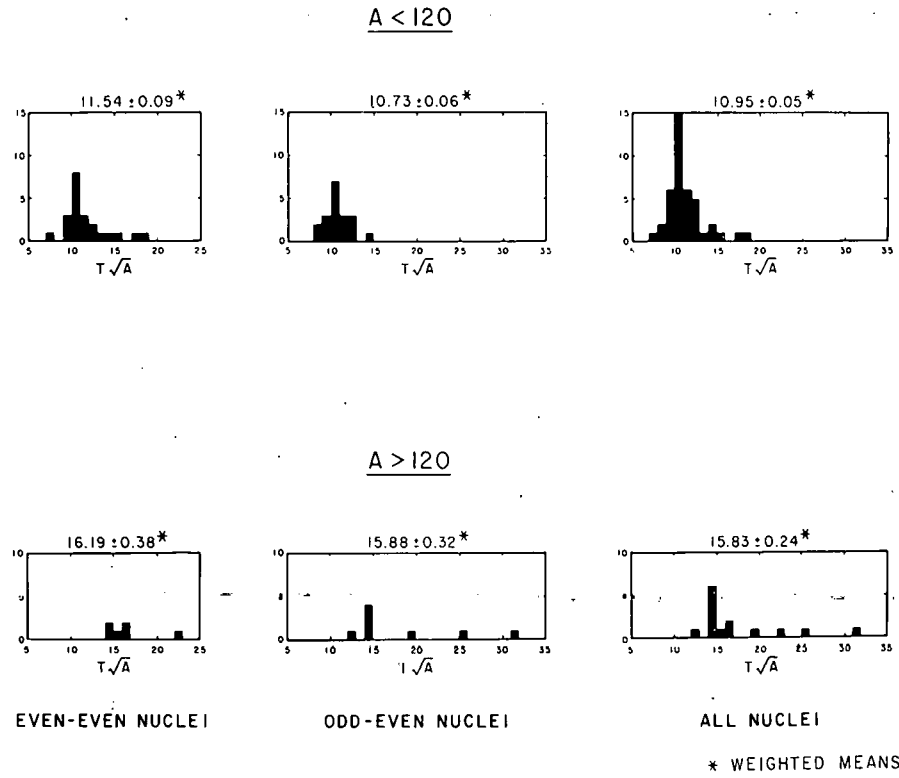


Fig. 11. Distribution of $T\sqrt{A}$ for Nuclei with $A \geq 120$. ANL Neg. No. 103-B11673.

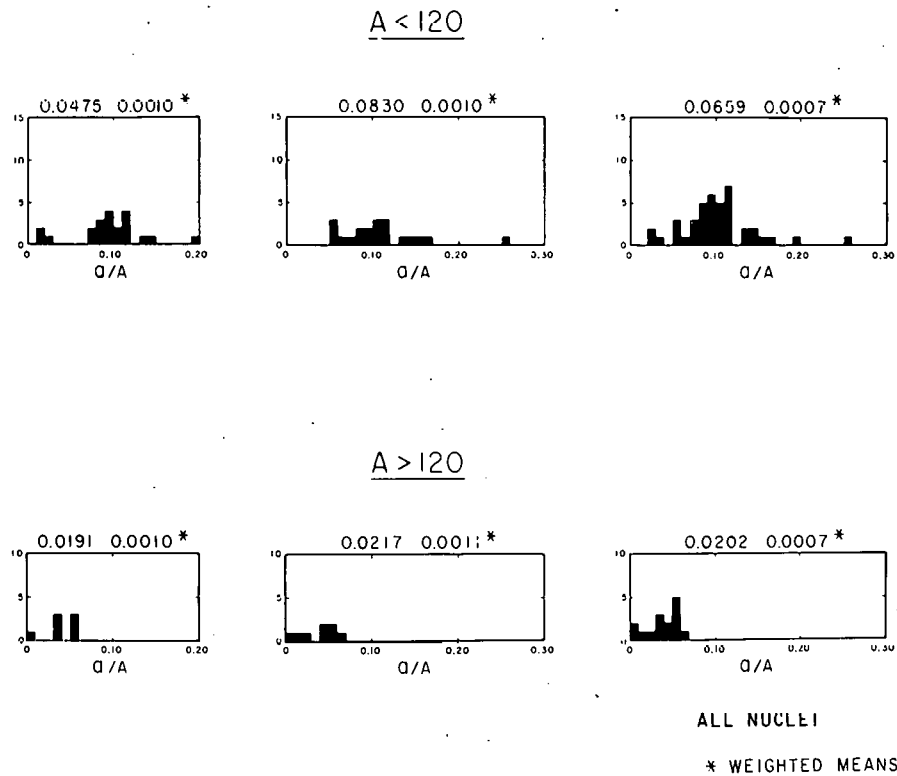


Fig. 12. Distribution of α/A for Nuclei with $A \geq 120$. ANL Neg. No. 103-B11672.

These four figures are largely self-explanatory, but we will list the major inferences from these data.

1. There is no evidence of differences in the systematics of odd-even and even-even nuclei.

2. As anticipated, there is a reasonable trend to constancy of $T\sqrt{A}$ and α/A , and this is much more clearly defined if the results are divided into those for nuclei less than and greater than mass 120. These trends are more clearly seen in the histograms (Figs. 11 and 12).

3. The spread of data for the constant-temperature fit is smaller than for the α fit; this supports the conclusion reached from the $\sigma_{ASYM}/\sigma_{ne}$ data (Sec. VI) that the constant-temperature model is a better fit.

4. For $A < 120$, the approximate constancy of $T\sqrt{A}$ is clear. The distribution appears to be somewhat asymmetric about a weighted mean value of 10.95 ± 0.05 (where the errors in the separate values are used to determine the error), and about two-thirds of the data points lie in the range 11.0 ± 1.5 . This spread in $T\sqrt{A}$ probably principally represents the real spread in this parameter for different nuclei, rather than the consequences of experimental errors. Thus, if precise data are needed for a given nucleus, they must be obtained by measurement rather than from the systematics.

5. For $A > 120$, the values of $T\sqrt{A}$ are again approximately constant, but at a higher value than for $A < 120$. The statistics, however, are poor, and

there is some evidence from the heaviest nuclei of an increase of $T\sqrt{A}$ with increasing A ; examination of the data in Table I for these nuclei will show that the confidence that can be placed in the experiments for the heaviest nuclei is not large. In general, the scarcity of data for $A > 145$ makes any conclusions hazardous for this mass range.

6. The trends indicated for $T\sqrt{A}$ are roughly reproduced for the α/A data, but the greater spread in these latter makes them much less clear.

7. The $T\sqrt{A}$ and α/A data for magic-number nuclei collected in Table IV show that there is no significant indication of shell effects in the $(n, 2n)$ data. The values of these quantities and their spread for

a given magic number is similar to that exhibited by non-magic-number nuclei, and even if it is assumed that some effects are present, it is clear that magic-number nuclei only sometimes show shell effects.

TABLE IV. Systematics of $T\sqrt{A}$ and α/A for Magic-number Target Nuclei

Isotope N X A Z	N or Z	Magic Number	$T\sqrt{A}$	Error	α/A	Error
${}^{20}_{19}\text{K}^{39}$	N	20	14.13	1.22	0.0528	0.0108
${}^{28}_{24}\text{Cr}^{52}$	N	28	8.16	0.54	0.1995	0.0325
${}^{28}_{26}\text{Fe}^{54}$	N	28	9.44	0.65	0.0884	0.0169
${}^{30}_{28}\text{Ni}^{58}$	Z	28	10.72	0.25	0.1067	0.0051
${}^{50}_{37}\text{Rb}^{87}$	N	50	10.33	0.53	0.1052	0.0125
${}^{50}_{39}\text{Y}^{89}$	N	50	10.83	0.30	0.0951	0.0067
${}^{50}_{40}\text{Zr}^{90}$	N	50	10.47	0.24	0.1155	0.0048
${}^{50}_{42}\text{Mo}^{92}$	N	50	17.63	0.81	0.0245	0.0037
${}^{62}_{50}\text{Sn}^{112}$	Z	50	10.49	0.37	0.0964	0.0080
${}^{82}_{58}\text{Ce}^{140}$	N	82	14.58	0.93	0.0564	0.0081
${}^{82}_{59}\text{Pr}^{141}$	N	82	14.11	0.75	0.0581	0.0066
${}^{82}_{60}\text{Nd}^{142}$	N	82	15.28	0.66	0.0517	0.0046
${}^{82}_{62}\text{Sm}^{144}$	N	82	16.86	0.68	0.0390	0.0040
${}^{122}_{82}\text{Pb}^{204}$	Z	82	22.62	1.51	0.0090	0.0012

VIII. SUMMARY OF CONCLUSIONS

1. Analysis shows that all the currently available energy-dependent measurements of $(n, 2n)$ cross sections can be described within the experimental errors by the ratio of the asymptotic cross section to the nonelastic cross section, which is dependent upon the neutron-asymmetry parameter, and a level-density parameter (temperature), which is dependent on the nuclear mass.

2. For values of the neutron-asymmetry parameter $(N - Z)/A$ greater than about 0.03, the best description of the asymptotic cross section is given by

$$\frac{\sigma_{\text{ASYM}}}{\sigma_{\text{ne}}} = 1 - (1.645 \pm 0.084) \exp \left[-(15.64 \pm 1.09) \frac{N - Z}{A} \right]$$

for the constant-temperature model and

$$\frac{\sigma_{\text{ASYM}}}{\sigma_{\text{ne}}} = 1 - (1.749 \pm 0.104) \exp \left[-(17.66 \pm 1.33) \frac{N - Z}{A} \right]$$

for a simple level-density formulation.

3. Both models fit the experimental data adequately, but the constant-temperature model is significantly better since it gives less spread in the derived parameters.

4. The mass dependence of the nuclear temperature T is well described by a nominally constant value of $T \sqrt{A}$ of 11.0 for nuclei of mass < 120 , but the spread of this parameter is significant. The distribution is probably asymmetric, but two-thirds of the data points lie in the range 11.0 ± 1.5 . This spread probably indicates the real variation in $T \sqrt{A}$ for different nuclei rather than the experimental errors in the cross-section measurements.

5. For nuclei of $A > 120$, the mean value of $T \sqrt{A}$ is clearly higher, and the weighted mean is about 16 for the cases studied. There is some indication that $T \sqrt{A}$ increases with increasing A (for $A > 120$), but the evidence is not good, and in general, data are very limited for $A > 145$.

6. There is no evidence of different systematics for odd-even and even-even nuclei.

7. There is no evidence for any significant magic-number effects.

APPENDIX A

List of Data References

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APPENDIX B

(n, 2n) Cross-section Data, Fitted to Constant-
temperature Model and to Level-density Model

C-12 ...FROM REF. A 73 (-)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
22,800	3.00 .30	7.493	3.49
23,900	6.30 .60	7.486	1.713
25,000	11.40 1.00	13.828	1.213
26,000	13.90 1.30	17.181	1.607
26,700	16.30 1.50	20.418	1.879
28,000	20.70 1.90	26.584	2.440
29,700	22.90 2.30	30.399	3.053
30,400	25.80 2.30	34.725	3.096
31,300	27.00 2.40	36.995	3.288
32,600	24.20 2.40	34.035	3.375
33,600	27.00 2.70	38.752	3.875

FITTED PARAMETERS

NUCLEAR TEMP. = 6.173 PLUS-OR-MINUS .750 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 66.53 PLUS-OR-MINUS 10.52 MB

RELATED DATA

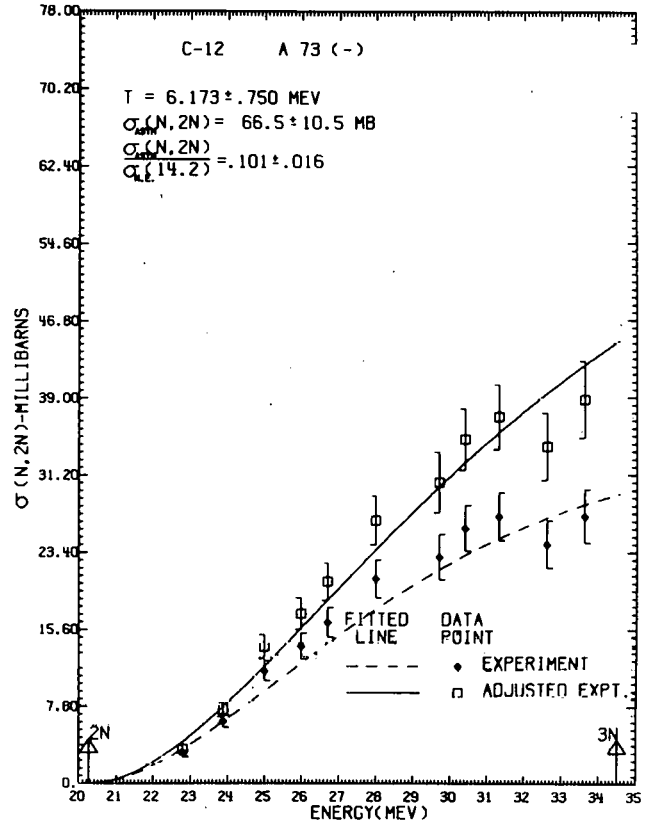
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 660.31 MB
 (N,2N) THRESHOLD = 20.28 MEV
 (N,3N) THRESHOLD = 34.50 MEV

THIS ISOTOPE HAS 6 NEUTRONS, 6 PROTONS, (MASS = 12)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .1006 PLUS-OR-MINUS .0159

T*SQRT(N) = 15.121 T*SQRT(A) = 21.384
 ERROR 1.837 ERROR 2.598



C-12 ...FROM REF. A 73 (-)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
22,800	3.00 .30	7.493	3.49
23,900	6.30 .60	7.486	1.713
25,000	11.40 1.00	13.828	1.213
26,000	13.90 1.30	17.181	1.607
26,700	16.30 1.50	20.418	1.879
28,000	20.70 1.90	26.584	2.440
29,700	22.90 2.30	30.399	3.053
30,400	25.80 2.30	34.725	3.096
31,300	27.00 2.40	36.995	3.288
32,600	24.20 2.40	34.035	3.375
33,600	27.00 2.70	38.752	3.875

FITTED PARAMETERS

LEVEL SPACING = .339 PLUS-OR-MINUS .137 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 111.29 PLUS-OR-MINUS 33.55 MB

RELATED DATA

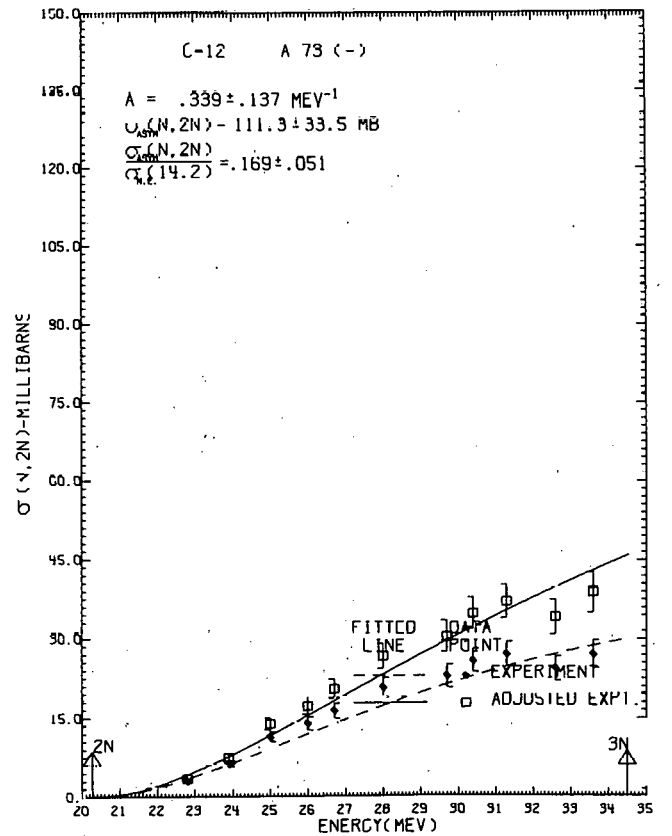
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 660.31 MB
 (N,2N) THRESHOLD = 20.28 MEV
 (N,3N) THRESHOLD = 34.50 MEV

THIS ISOTOPE HAS 6 NEUTRONS, 6 PROTONS, (MASS = 12)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .1695 PLUS-OR-MINUS .0504

N/SPACING = 17.699 A/SPACING = 35.398
 ERROR 7.153 ERROR 14.305



C-12 ...FROM REF. B 61 (808)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
25,000	10,00 1,50	12,130	1,819
27,800	12,30 .50	15,735	.640
30,400	15,50 .30	20,862	.404
32,200	17,50 .30	24,415	.419
34,000	17,30 .50	25,034	.724

FITTED PARAMETERS

NUCLEAR TEMP. = 4.409 PLUS-OR-MINUS .541 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 31.65 PLUS-OR-MINUS 2.82 MB

RELATED DATA

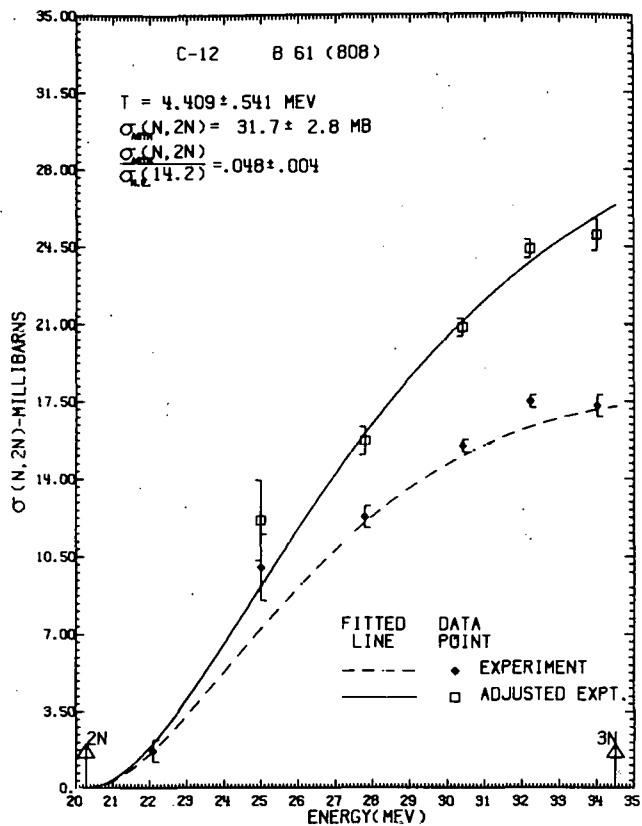
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 660.31 MB
 (N,2N) THRESHOLD = 20.28 MEV
 (N,3N) THRESHOLD = 34.50 MEV

THIS ISOTOPE HAS 6 NEUTRONS, 6 PROTONS, (MASS = 12)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0479 PLUS-OR-MINUS .0043

T*SQRT(N) = 10.800 T*SQRT(A) = 15.273
 ERROR 1.325 ERROR 1.874



C-12 ...FROM REF. B 61 (808)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
25,000	10,00 1,50	12,130	1,819
27,800	12,30 .50	15,735	.640
30,400	15,50 .30	20,862	.404
32,200	17,50 .30	24,415	.419
34,000	17,30 .50	25,034	.724

FITTED PARAMETERS

LEVEL SPACING = 1.091 PLUS-OR-MINUS .335 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 36.92 PLUS-OR-MINUS 5.05 MB

RELATED DATA

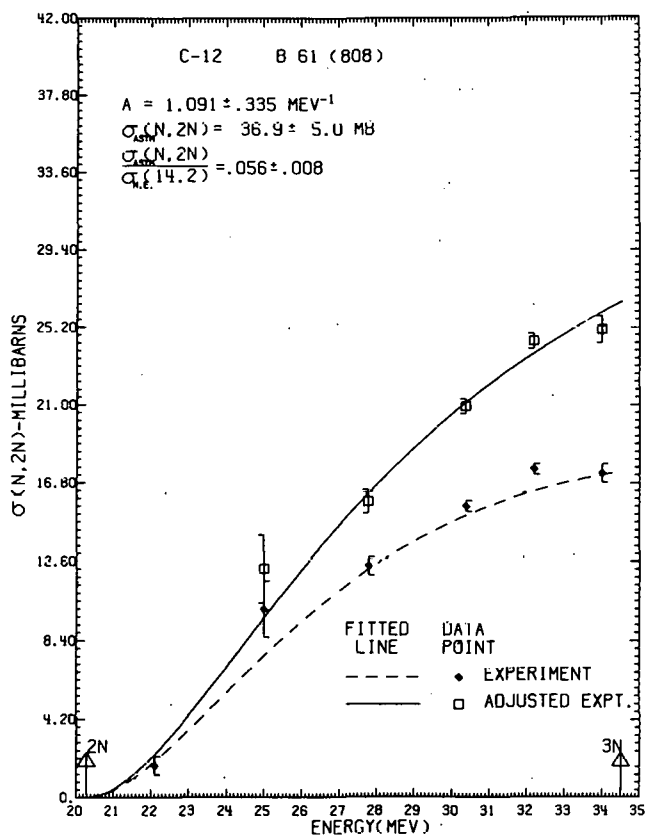
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 660.31 MB
 (N,2N) THRESHOLD = 20.28 MEV
 (N,3N) THRESHOLD = 34.50 MEV

THIS ISOTOPE HAS 6 NEUTRONS, 6 PROTONS, (MASS = 12)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0549 PLUS-OR-MINUS .0076

N/SPACING = 5.500 A/SPACING = 10.999
 ERROR 1.689 ERROR 3.377



C-12 ... FROM REF, B 52 (83)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
23,000	4.75	1.00	5.551	1.169	
24,000	5.00	1.00	5.953	1.191	
27,000	10.00	1.00	12.598	1.260	

FITTED PARAMETERS

NUCLEAR TEMP. = 2.790 PLUS-OR-MINUS 1.064 MEV

ASYMPTOTIC (N,2N) CROSS SECTION = 17.92 PLUS-OR-MINUS 0.57 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 660.31 MB

(N,2N) THRESHOLD = 20.28 MEV

(N,3N) THRESHOLD = 34.50 MEV

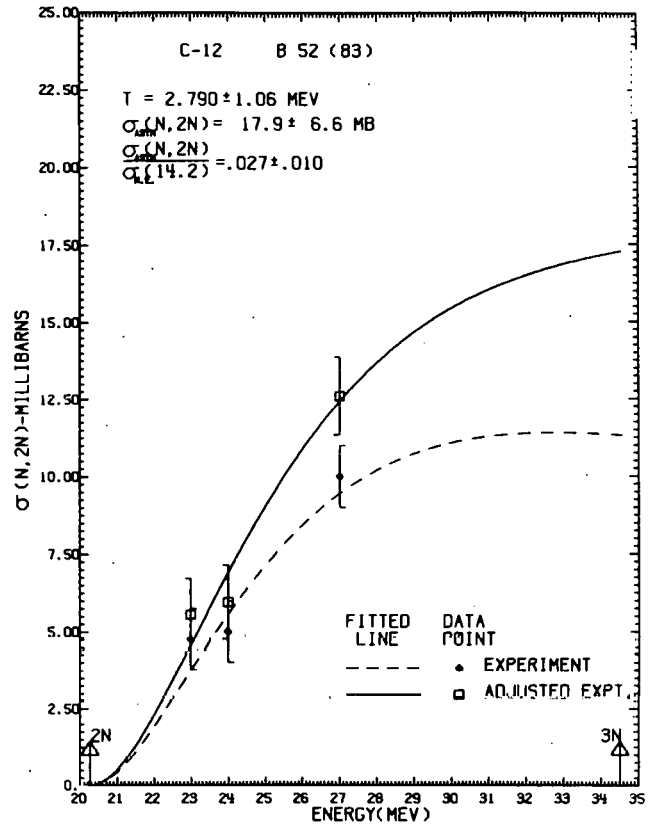
THIS ISOTOPE HAS 6 NEUTRONS, 6 PROTONS, (MASS = 12)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .0271 PLUS-OR-MINUS .0100

T*SQRT(N) = 6.834 T*SQRT(A) = 9.665

ERROR 2.606 ERROR 3.686



C-12 ... FROM REF, B 52 (83)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
23,000	4.75	1.00	5.551	1.169	
24,000	5.00	1.00	5.953	1.191	
27,000	10.00	1.00	12.598	1.260	

FITTED PARAMETERS

LEVEL SPACING = 2.427 PLUS-OR-MINUS 2.143 PER MEV

ASYMPTOTIC (N,2N) CROSS SECTION = 20.78 PLUS-OR-MINUS 9.85 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 660.31 MB

(N,2N) THRESHOLD = 20.28 MEV

(N,3N) THRESHOLD = 34.50 MEV

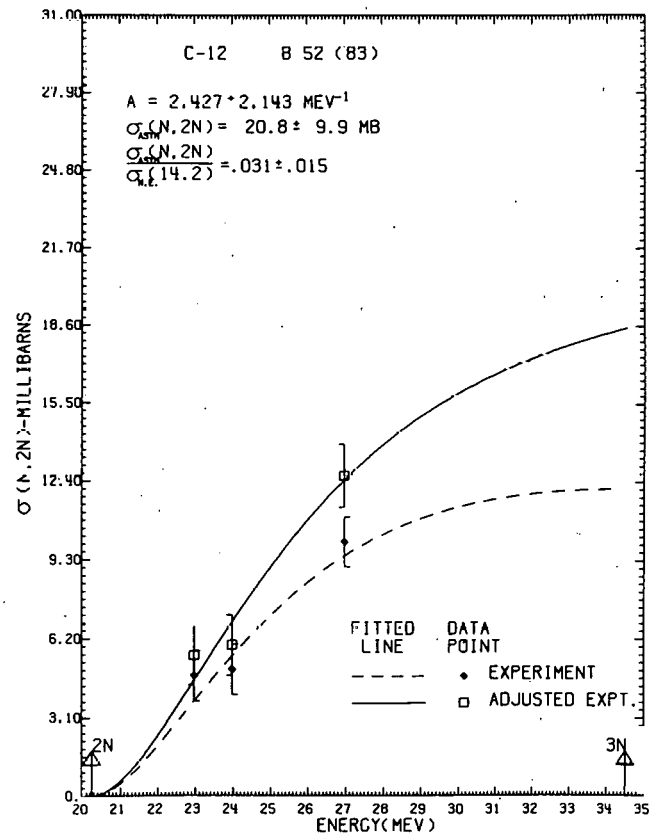
THIS ISOTOPE HAS 6 NEUTRONS, 6 PROTONS, (MASS = 12)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .0315 PLUS-OR-MINUS .0149

N/SPACING = 2.472 A/SPACING = 4.944

ERROR 2.183 ERROR 4.366



N-14 ...FROM REF. B 65 (843)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB) ADJUSTED	ERR
13.200	3.30	.40	3.300	.400
14.000	6.00	.30	6.000	.300
14.100	6.30	.40	6.300	.400
15.200	8.70	.70	8.850	.712
15.800	9.60	.70	9.867	.719
16.000	9.50	.80	9.798	.825
17.000	10.20	.80	10.705	.840
17.500	10.90	.80	11.940	.847
17.900	10.90	.90	11.621	.960
18.100	11.50	.80	12.304	.856
18.500	10.00	.80	10.775	.862
18.800	10.70	.80	11.591	.867

FITTED PARAMETERS

NUCLEAR TEMP. = 1.729 PLUS-OR-MINUS .075 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 12.90 PLUS-OR-MINUS .43 MB

RELATED DATA

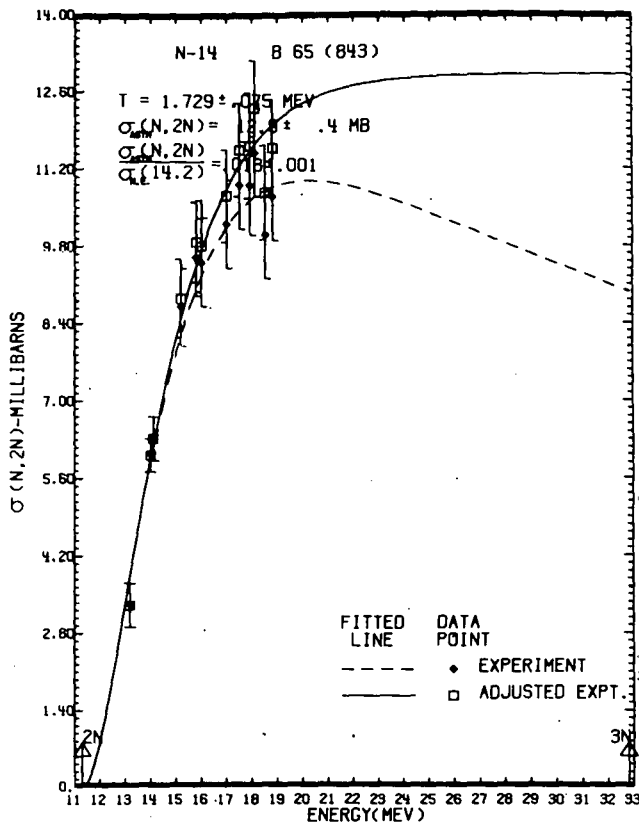
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 713.92 MB
 (N,2N) THRESHOLD = 11.31 MEV
 (N,3N) THRESHOLD = 32.81 MEV

THIS ISOTOPE HAS 7 NEUTRONS, 7 PROTONS, (MASS = 14)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0181 PLUS-OR-MINUS .0006

T*SQRT(N) = 4.575 T*SQRT(A) = 6.469
 ERROR .198 ERROR .281



N-14 ...FROM REF. B 65 (843)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB) ADJUSTED	ERR
13.200	3.30	.40	3.300	.400
14.000	6.00	.30	6.000	.300
14.100	6.30	.40	6.300	.400
15.200	8.70	.70	8.850	.712
15.800	9.60	.70	9.867	.719
16.000	9.50	.80	9.798	.825
17.000	10.20	.80	10.705	.840
17.500	10.90	.80	11.940	.847
17.900	10.90	.90	11.621	.960
18.100	11.50	.80	12.304	.856
18.500	10.00	.80	10.775	.862
18.800	10.70	.80	11.591	.867

FITTED PARAMETERS

LEVEL SPACING = 4.005 PLUS-OR-MINUS .463 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 14.12 PLUS-OR-MINUS .70 MB

RELATED DATA

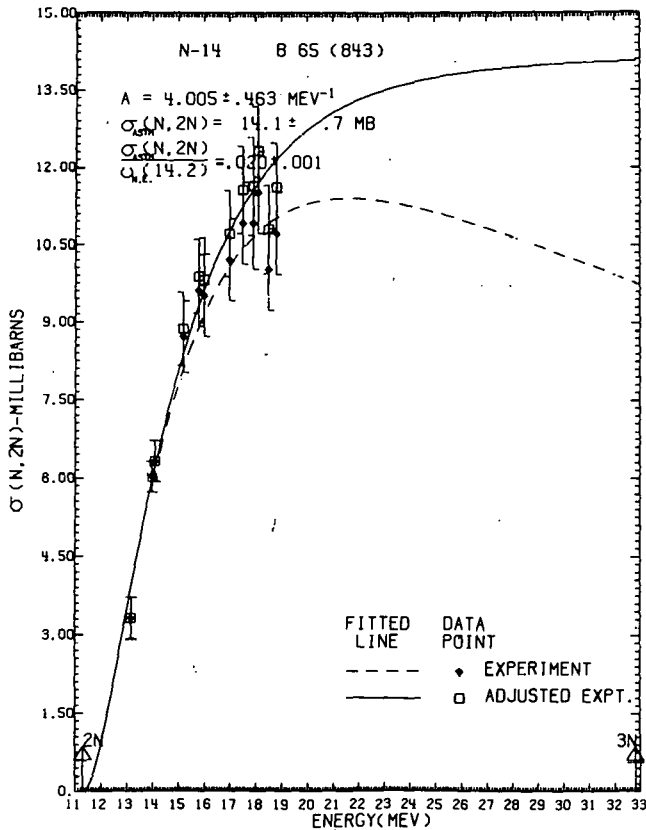
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 713.92 MB
 (N,2N) THRESHOLD = 11.31 MEV
 (N,3N) THRESHOLD = 32.81 MEV

THIS ISOTOPE HAS 7 NEUTRONS, 7 PROTONS, (MASS = 14)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0198 PLUS-OR-MINUS .0010

N/SPACING = 1.748 A/SPACING = 3.496
 ERROR .202 ERROR .404



N-14 ... FROM REF. B 61 (808)

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
14.000	19.00 10.00	19.000 10.000
16.200	9.00 1.00	9.315 1.035
17.800	9.30 1.00	9.898 1.064
19.500	10.00 2.00	10.968 2.194
21.300	8.50 2.50	9.630 2.832
22.000	17.50 5.00	20.080 5.737
25.000	17.80 6.00	21.591 7.278
27.500	7.50 5.00	9.540 6.360
30.500	12.50 4.00	16.857 5.394

FITTED PARAMETERS

NUCLEAR TEMP. = 1.865 PLUS-OR-MINUS .633 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 12.19 PLUS-OR-MINUS 2.02 MB

RELATED DATA

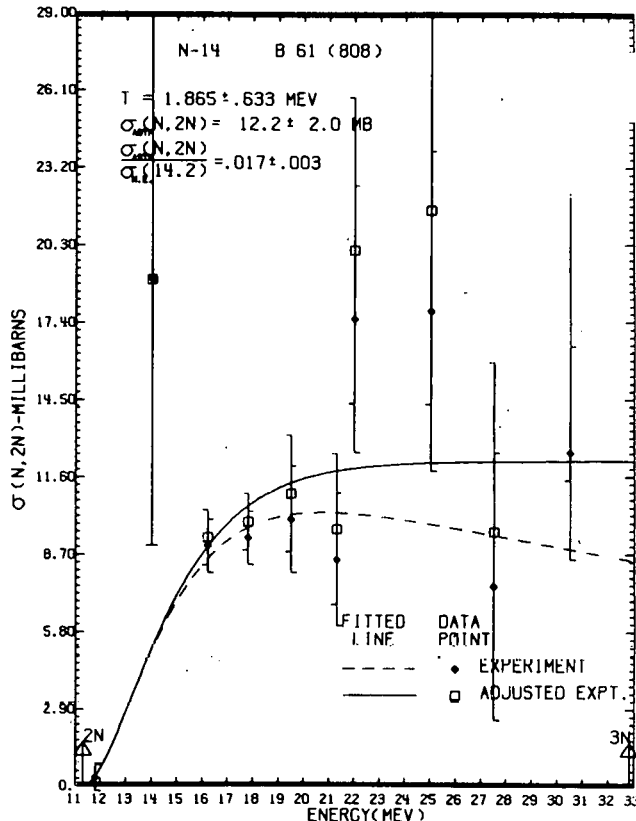
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 713.92 MB
 (N,2N) THRESHOLD = 11.31 MEV
 (N,3N) THRESHOLD = 32.81 MEV

THIS ISOTOPE HAS 7 NEUTRONS, 7 PROTONS, (MASS = 14)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0171 PLUS-OR-MINUS .0028

T=30RT(N) = 4.934 T=30RT(A) = 6.970
 ERROR 1.675 ERROR 2.368



N-14 ... FROM REF. B 61 (808)

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
14.000	19.00 10.00	19.000 10.000
16.200	9.00 1.00	9.315 1.035
17.800	9.30 1.00	9.898 1.064
19.500	10.00 2.00	10.968 2.194
21.300	8.50 2.50	9.630 2.832
22.000	17.50 5.00	20.080 5.737
25.000	17.80 6.00	21.591 7.278
27.500	7.50 5.00	9.540 6.360
30.500	12.50 4.00	16.857 5.394

FITTED PARAMETERS

LEVEL SPACING = 3.914 PLUS-OR-MINUS 2.723 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 12.94 PLUS-OR-MINUS 2.59 MB

RELATED DATA

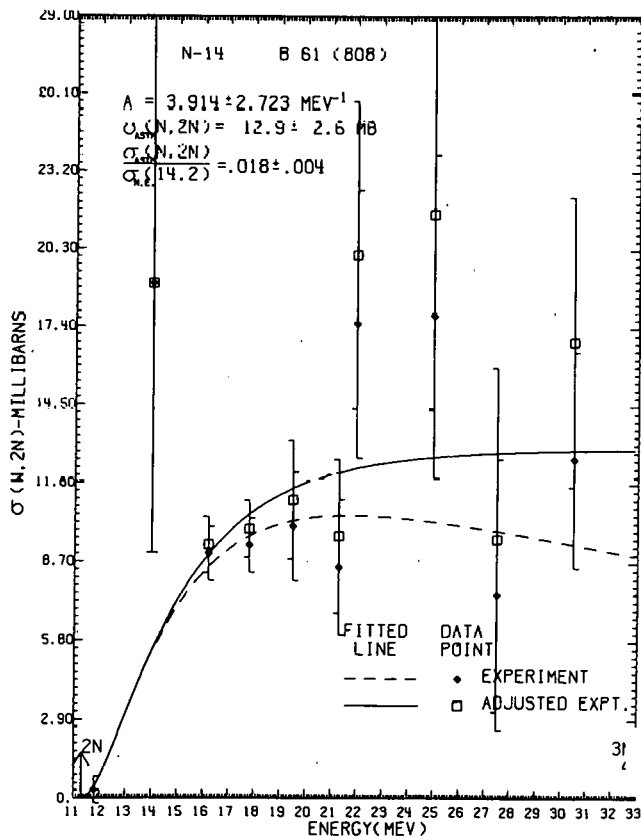
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 713.92 MB
 (N,2N) THRESHOLD = 11.31 MEV
 (N,3N) THRESHOLD = 32.81 MEV

THIS ISOTOPE HAS 7 NEUTRONS, 7 PROTONS, (MASS = 14)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0181 PLUS-OR-MINUS .0036

N/SPACING = 1.788 A/SPACING = 3.577
 ERROR 1.244 ERROR 2.488



N-14 FROM REF. F60 (602)

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
13.770	5.18 .60	5.100 .600
14.740	8.69 .90	8.771 .908
15.780	9.25 1.00	9.504 1.027
16.960	10.49 1.00	11.001 1.049
17.980	11.57 1.20	12.353 1.281

FITTED PARAMETERS

NUCLEAR TEMP. = 1.791 PLUS-OR-MINUS .204 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 13.74 PLUS-OR-MINUS 1.22 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 713.92 MB
 (N,2N) THRESHOLD = 11.31 MEV
 (N,3N) THRESHOLD = 32.81 MEV

THIS ISOTOPE HAS 7 NEUTRONS, 7 PROTONS, (MASS = 14)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0192 PLUS-OR-MINUS .0017

T=SQRT(N) = 4.739 T=SQRT(A) = 6.701
 ERROR .540 ERROR .763

N-14 FROM REF. F60 (602)

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
13.770	5.18 .60	5.100 .600
14.740	8.69 .90	8.771 .908
15.780	9.25 1.00	9.504 1.027
16.960	10.49 1.00	11.001 1.049
17.980	11.57 1.20	12.353 1.281

FITTED PARAMETERS

LEVEL SPACING = 3.623 PLUS-OR-MINUS 1.014 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 15.36 PLUS-OR-MINUS 1.91 MB

RELATED DATA

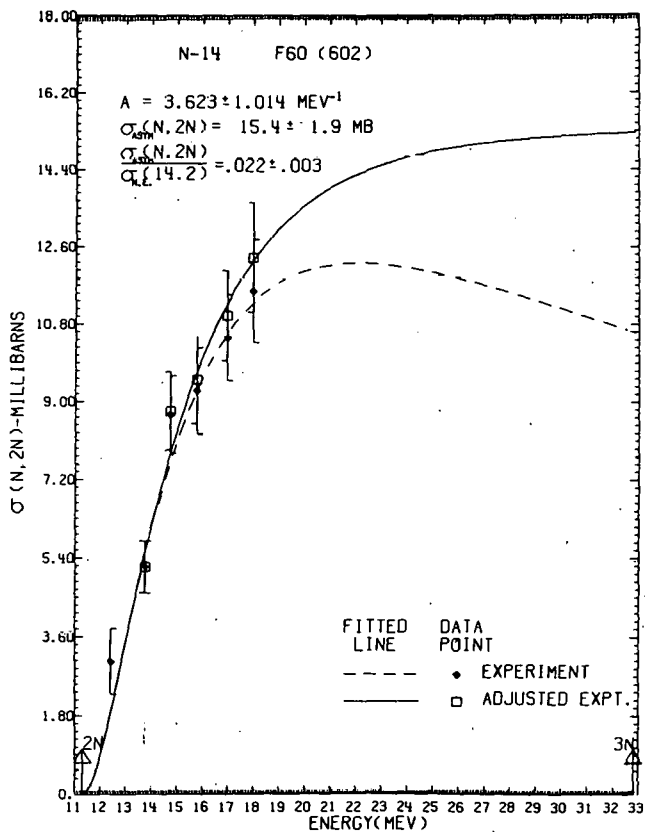
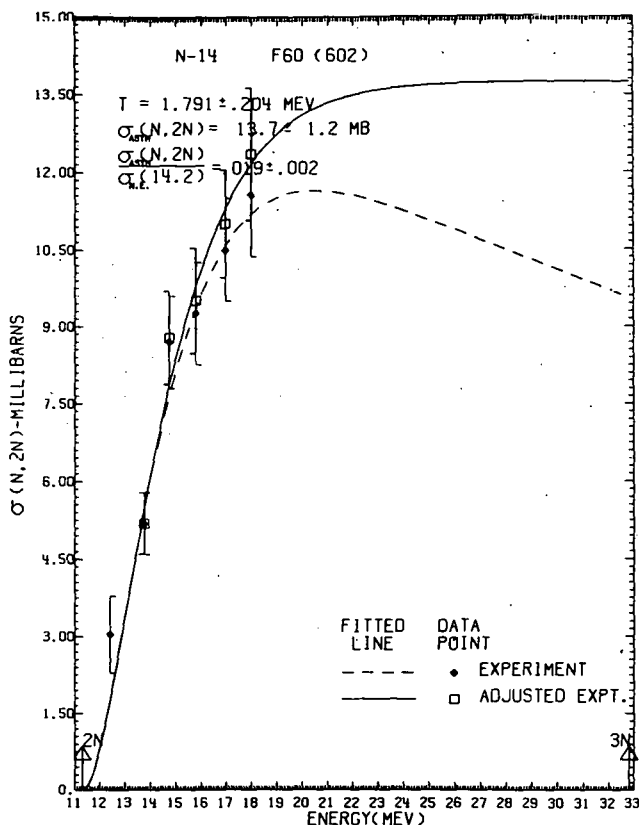
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 713.92 MB
 (N,2N) THRESHOLD = 11.31 MEV
 (N,3N) THRESHOLD = 32.81 MEV

THIS ISOTOPE HAS 7 NEUTRONS, 7 PROTONS, (MASS = 14)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0215 PLUS-OR-MINUS .0027

L/SPACING = 1.932 A/SPACING = 3.864
 ERROR .541 ERROR 1.082



N-14 ...FROM REF, P 60 (1720)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.850	5.50 .50	5.500	.500
14.150	7.00 .70	7.000	.700
14.400	7.50 .70	7.526	.702
14.700	8.20 .80	8.270	.807
14.950	9.20 .90	9.319	.912
15.350	11.00 1.00	11.219	1.020

FITTED PARAMETERS

NUCLEAR TEMP. = 3.613 PLUS-OR-MINUS .684 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 35.58 PLUS-OR-MINUS 9.77 MB

RELATED DATA

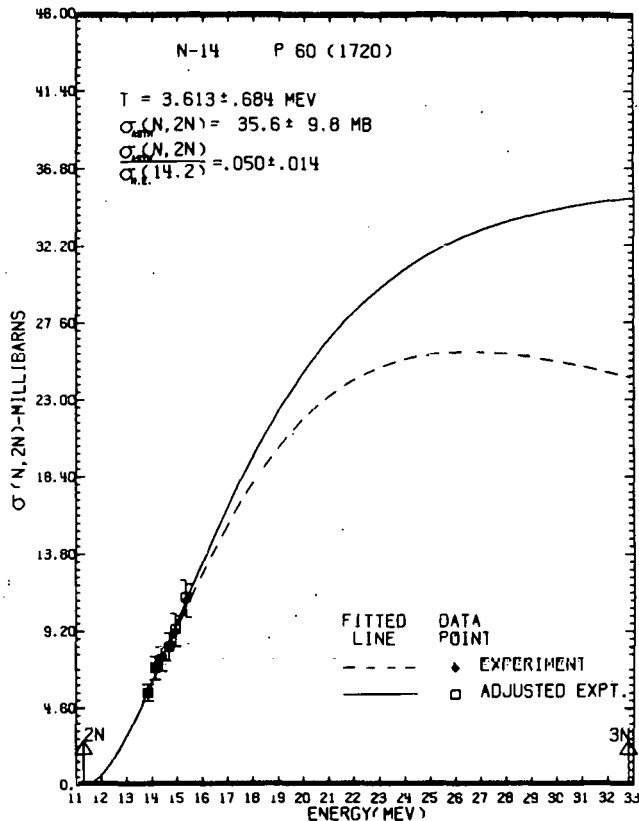
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 713.92 MB
 (N,2N) THRESHOLD = 11.31 MEV
 (N,3N) THRESHOLD = 32.81 MEV

THIS ISOTOPE HAS 7 NEUTRONS, 7 PROTONS, (MASS = 14)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0498 PLUS-OR-MINUS .0137

T*SQRT(N) = 9.559 ERROR 1.810 T*SQRT(A) = 13.519 ERROR 2.559



N-14 ...FROM REF, P 60 (1720)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.850	5.50 .50	5.500	.500
14.150	7.00 .70	7.000	.700
14.400	7.50 .70	7.526	.702
14.700	8.20 .80	8.270	.807
14.950	9.20 .90	9.319	.912
15.350	11.00 1.00	11.219	1.020

FITTED PARAMETERS

LEVEL SPACING = .473 PLUS-OR-MINUS .267 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 68.89 PLUS-OR-MINUS 34.03 MB

RELATED DATA

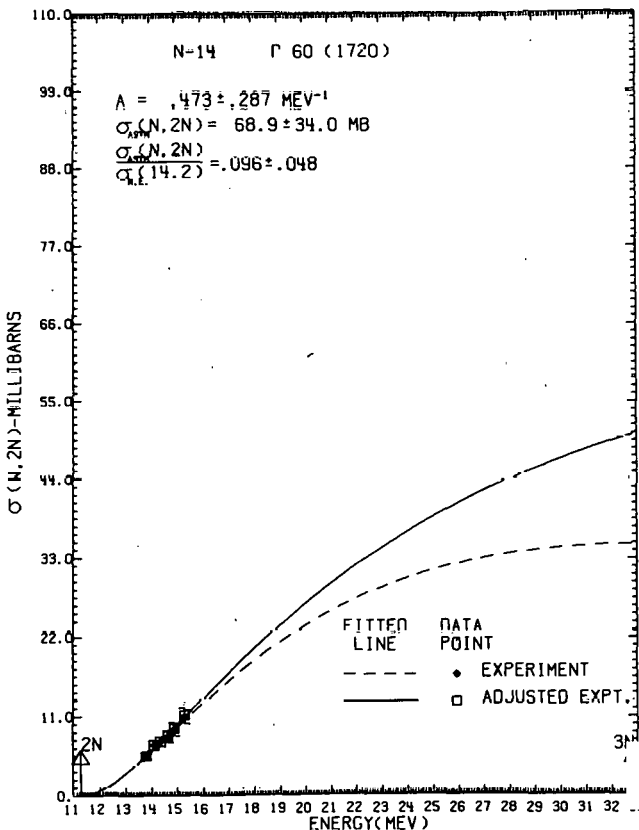
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 713.92 MB
 (N,2N) THRESHOLD = 11.31 MEV
 (N,3N) THRESHOLD = 32.81 MEV

THIS ISOTOPE HAS 7 NEUTRONS, 7 PROTONS, (MASS = 14)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0965 PLUS-OR-MINUS .0477

N/SPACING = 14.799 ERROR 8.980 A/SPACING = 29.598 ERROR 17.959



O-16 FROM REF. B 61 (808)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
19,700	2,00	.50	2,201	.590	
21,200	3,30	.60	3,732	.679	
22,000	6,00	1,50	6,885	1,721	
25,000	11,80	2,50	14,313	3,032	
27,600	15,00	1,20	19,116	1,529	
30,500	16,00	1,00	21,577	1,349	

FITTED PARAMETERS

NUCLEAR TEMP. = 9.194 PLUS-OR-MINUS 2.307 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 50.86 PLUS-OR-MINUS 16.34 MB

RELATED DATA

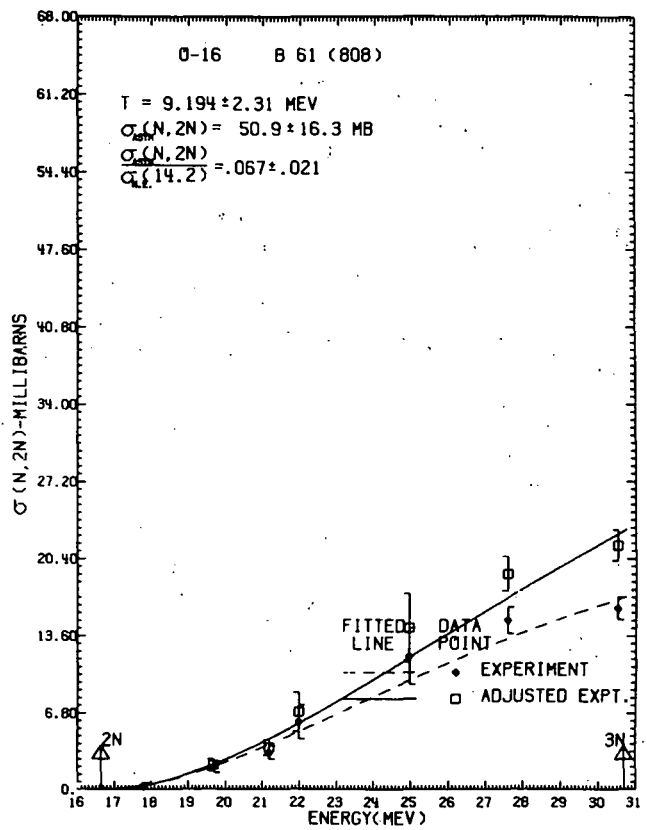
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 763.26 MB
 (N,2N) THRESHOLD = 16.65 MEV
 (N,3N) THRESHOLD = 30.69 MEV

THIS ISOTOPE HAS 8 NEUTRONS, 8 PROTONS, (MASS = 16)

NEUTRON EXCESS PARAMETER = .00000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0666 PLUS-OR-MINUS .0214

T*SQRT(N) = 26.005 T*SQRT(A) = 36.776
 ERROR 6.525 ERROR 9.228



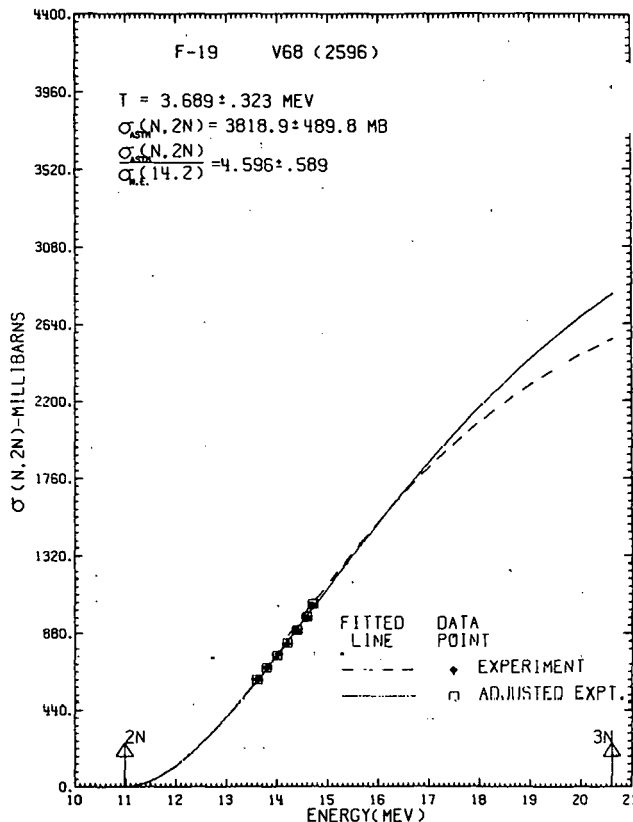
NO "A" FIT POSSIBLE

F-19 ...FROM REF. V68 (2596)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.600	613.00 6.00	613.000	6.000
13.800	683.00 7.00	683.000	7.000
14.000	754.00 8.00	754.000	8.000
14.200	824.00 8.00	824.000	8.000
14.400	894.00 9.00	897.055	9.031
14.600	965.00 10.00	971.612	10.069
14.700	1035.00 10.00	1043.875	10.086

FITTED PARAMETERS
 NUCLEAR TEMP. = 3.689 PLUS-OR-MINUS .323 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 3818.90 PLUS-OR-MINUS 489.77 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV
 THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)
 NEUTRON EXCESS PARAMETER = .05263
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 4.5961 PLUS-OR-MINUS .5894
 T*SQRT(N) = 11.666 T*SQRT(A) = 16.080
 ERROR 1.021 ERROR 1.408

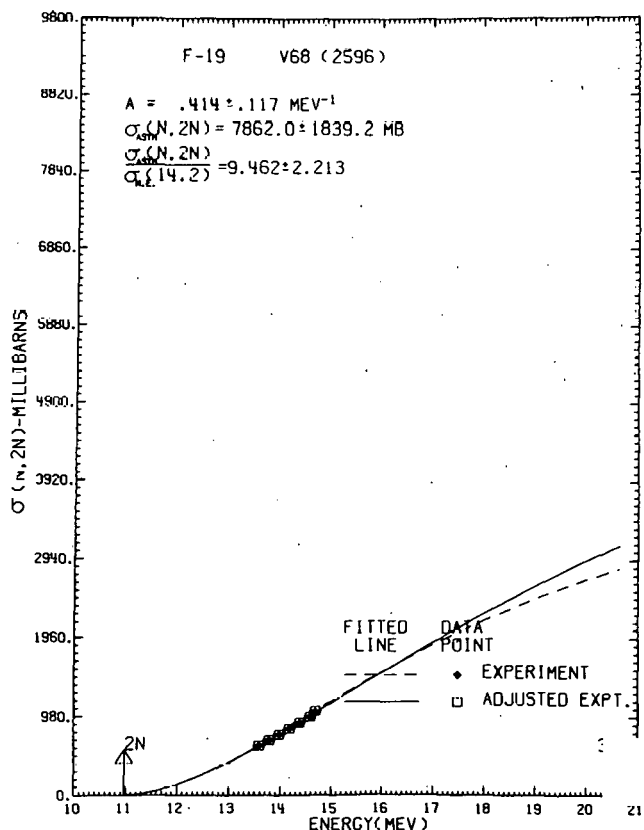


F-19 ...FROM REF. V68 (2596)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.600	613.00 6.00	613.000	6.000
13.800	683.00 7.00	683.000	7.000
14.000	754.00 8.00	754.000	8.000
14.200	824.00 8.00	824.000	8.000
14.400	894.00 9.00	897.055	9.031
14.600	965.00 10.00	971.612	10.069
14.700	1035.00 10.00	1043.875	10.086

FITTED PARAMETERS
 LEVEL SPACING = .414 PLUS-OR-MINUS .117 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 7861.96 PLUS-OR-MINUS 1839.17 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV
 THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)
 NEUTRON EXCESS PARAMETER = .05263
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 9.4620 PLUS-OR-MINUS 2.2135
 N/SPACING = 24.155 1/SPACING = 45.894
 ERROR 6.826 ERROR 12.970



F-19 FROM REF. M 67 (1686)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.700	16.30	1.60	16.300 1.600
12.940	22.80	2.30	22.800 2.300
13.280	26.40	2.60	26.400 2.600
13.500	30.50	3.70	30.500 3.700
14.960	60.80	6.00	61.595 6.078
15.820	71.40	7.00	73.413 7.197
16.520	78.90	7.70	82.114 8.014
17.350	90.50	9.50	95.850 10.062
18.440	90.20	9.00	98.098 9.788
19.390	85.40	8.40	94.852 9.330

FITTED PARAMETERS

NUCLEAR TEMP. = 2.662 PLUS-OR-MINUS .157 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 128.15 PLUS-OR-MINUS 8.69 MB

RELATED DATA

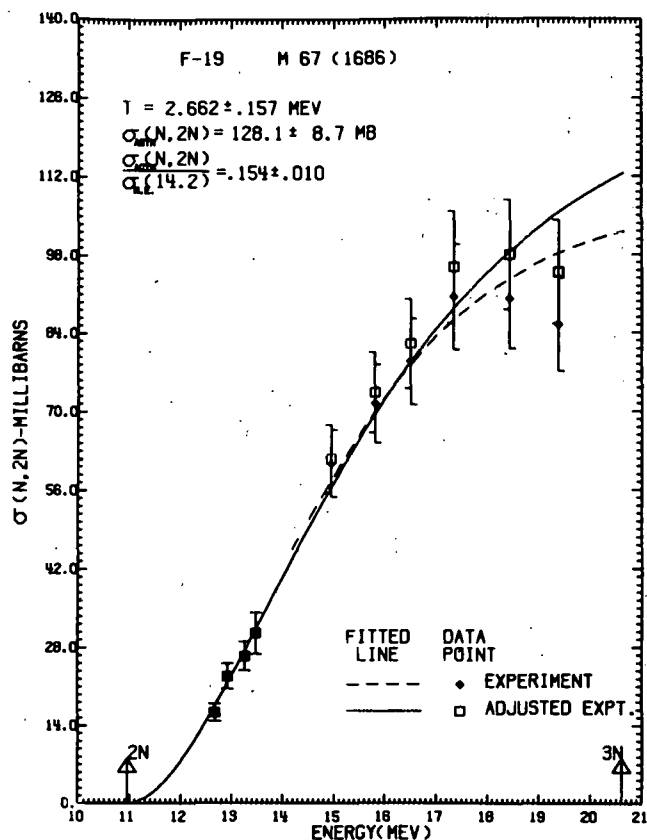
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV

THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)

NEUTRON EXCESS PARAMETER = .05263

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .1542 PLUS-OR-MINUS .0105

T*SQRT(N) = 8.418 T*SQRT(A) = 11.603
 ERROR .496 ERROR .684



F-19 FROM REF. M 67 (1686)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.700	16.30	1.60	16.300 1.600
12.940	22.80	2.30	22.800 2.300
13.280	26.40	2.60	26.400 2.600
13.500	30.50	3.70	30.500 3.700
14.960	60.80	6.00	61.595 6.078
15.820	71.40	7.00	73.413 7.197
16.520	78.90	7.70	82.114 8.014
17.350	90.50	9.50	95.850 10.062
18.440	90.20	9.00	98.098 9.788
19.390	85.40	8.40	94.852 9.330

FITTED PARAMETERS

LEVEL SPACING = 1.309 PLUS-OR-MINUS .242 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 167.77 PLUS-OR-MINUS 20.09 MB

RELATED DATA

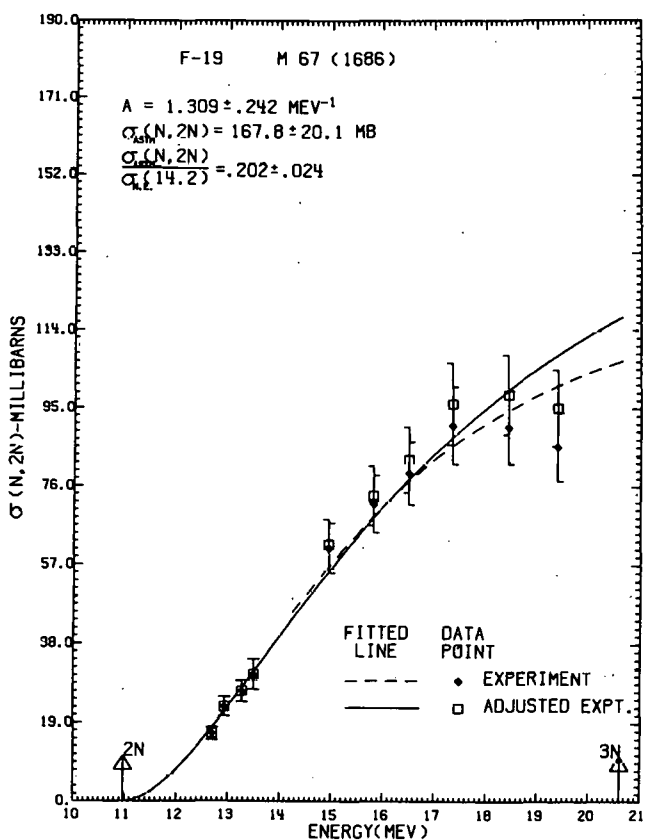
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV

THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)

NEUTRON EXCESS PARAMETER = .05263

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .2019 PLUS-OR-MINUS .0242

N/SPACING = 7.639 A/SPACING = 14.515
 ERROR 1.412 ERROR 2.683



F-19 ...FROM REF. B 65 (843)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.600	13.40	1.20	13.400	1.200
13.200	25.70	2.20	25.700	2.200
14.100	41.20	2.20	41.200	2.200
15.200	60.20	5.20	61.239	5.290
16.000	68.70	5.90	70.857	6.085
17.100	78.80	6.80	82.920	7.156
17.800	86.50	7.40	92.651	7.926
18.500	94.50	8.10	102.916	8.821
19.100	97.70	8.40	107.839	9.272
19.600	91.90	7.90	102.523	8.813

FITTED PARAMETERS

NUCLEAR TEMP. = 2.895 PLUS-OR-MINUS .127 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 136.67 PLUS-OR-MINUS 6.75 MB

RELATED DATA

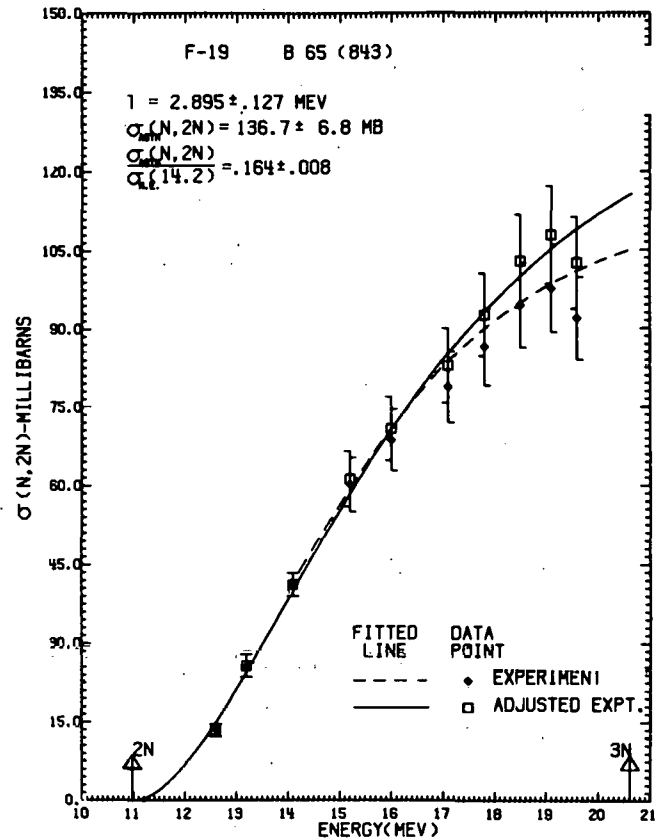
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV

THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)

NEUTRON EXCESS PARAMETER = .05263

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .1445 PLUS-OR-MINUS .0081

T*SQRT(N) = 9.155 T*SQRT(A) = 12.619
 ERROR .1402 ERROR .554



F-19 ...FROM REF. B 65 (843)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.600	13.40	1.20	13.400	1.200
13.200	25.70	2.20	25.700	2.200
14.100	41.20	2.20	41.200	2.200
15.200	60.20	5.20	61.239	5.290
16.000	68.70	5.90	70.857	6.085
17.100	78.80	6.80	82.920	7.156
17.800	86.50	7.40	92.651	7.926
18.500	94.50	8.10	102.916	8.821
19.100	97.70	8.40	107.839	9.272
19.600	91.90	7.90	102.523	8.813

FITTED PARAMETERS

LEVEL SPACING = 1.068 PLUS-OR-MINUS .157 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 186.30 PLUS-OR-MINUS 17.69 MB

RELATED DATA

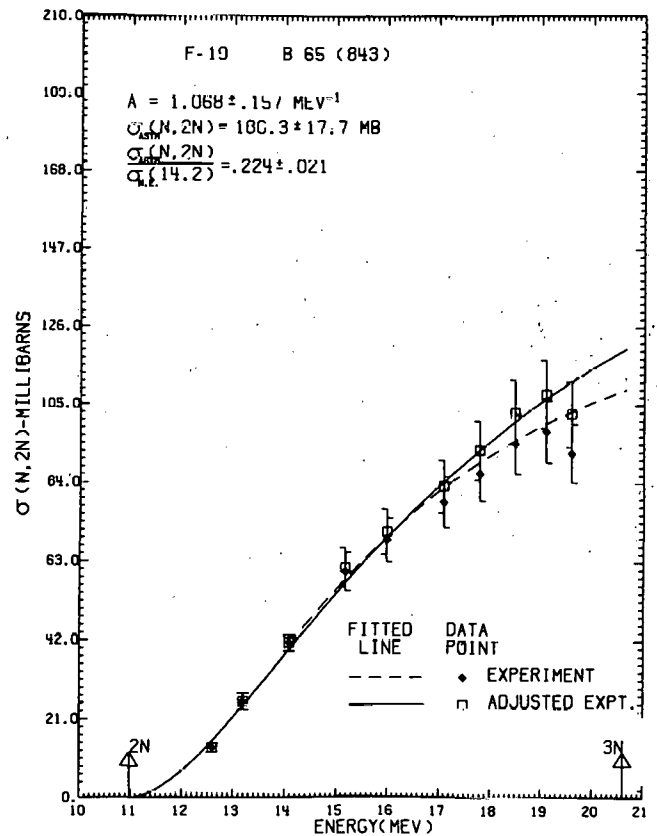
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV

THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)

NEUTRON EXCESS PARAMETER = .05263

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .2242 PLUS-OR-MINUS .0213

N/SPACING = 9.363 A/SPACING = 17.790
 ERROR 1.376 ERROR 2.615



F-19 ... FROM REF. P 65 (449)

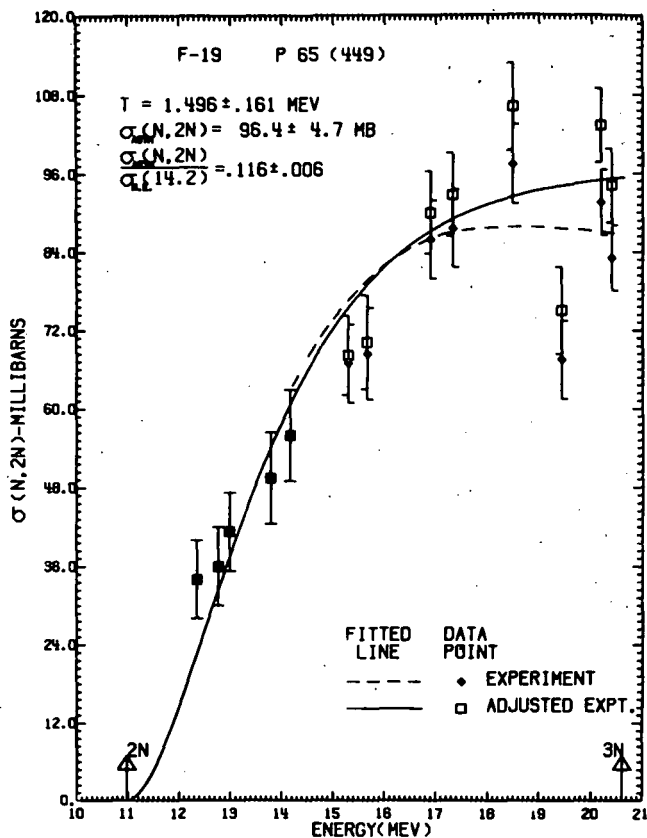
ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12,350	34,00	6,00	34,000	6,000
12,770	36,00	6,00	36,000	6,000
12,990	41,30	6,00	41,300	6,000
13,800	49,50	7,00	49,500	7,000
14,180	56,00	7,00	56,000	7,000
15,300	67,00	6,00	68,274	6,114
15,670	68,50	7,00	70,249	7,179
16,900	88,00	6,00	90,098	6,286
17,330	87,70	6,00	92,837	6,351
18,490	97,50	6,00	106,159	6,533
19,430	67,50	6,00	75,034	6,670
20,190	91,50	5,00	103,306	5,645
20,400	83,00	5,00	94,095	5,668

FITTED PARAMETERS

NUCLEAR TEMP. = 1.496 PLUS-OR-MINUS .161 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 96.42 PLUS-OR-MINUS 4.72 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV
 THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)
 NEUTRON EXCESS PARAMETER = .05263
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .1160 PLUS-OR-MINUS .0057
 T*SQRT(N) = 4.731 T*SQRT(A) = 6.521
 ERROR .509 ERROR .702



F-19 ... FROM REF. P 65 (449)

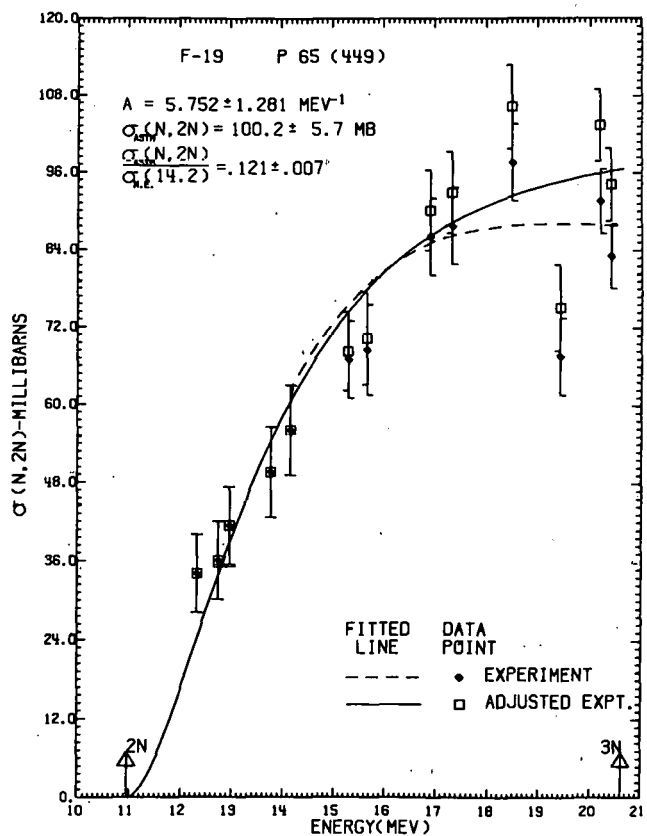
ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12,350	34,00	6,00	34,000	6,000
12,770	36,00	6,00	36,000	6,000
12,990	41,30	6,00	41,300	6,000
13,800	49,50	7,00	49,500	7,000
14,180	56,00	7,00	56,000	7,000
15,300	67,00	6,00	68,274	6,114
15,670	68,50	7,00	70,249	7,179
16,900	88,00	6,00	90,098	6,286
17,330	87,70	6,00	92,837	6,351
18,490	97,50	6,00	106,159	6,533
19,430	67,50	6,00	75,034	6,670
20,190	91,50	5,00	103,306	5,645
20,400	83,00	5,00	94,095	5,668

FITTED PARAMETERS

LEVEL SPACING = 5.752 PLUS-OR-MINUS 1.281 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 100.23 PLUS-OR-MINUS 5.73 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV
 THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)
 NEUTRON EXCESS PARAMETER = .05263
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .1206 PLUS-OR-MINUS .0069
 N/SPACING = 1.739 A/SPACING = 3.303
 ERROR .387 ERROR .736



F-19 FROM REF. R 63 (340)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12,600	15,40	1,40	15,400	1,400	
12,700	15,30	1,40	15,300	1,400	
13,100	25,50	2,30	25,500	2,300	
13,400	33,90	3,10	33,900	3,100	
13,500	35,20	3,20	35,200	3,200	
14,100	53,20	4,80	53,200	4,800	
14,300	60,90	5,50	61,004	5,509	
15,200	72,30	6,50	73,548	6,612	
15,900	81,70	7,40	84,119	7,619	
16,600	89,00	8,00	92,755	8,338	
17,200	98,70	8,90	104,132	9,390	
17,900	102,00	9,20	109,520	9,878	

FITTED PARAMETERS

NUCLEAR TEMP. = 3.371 PLUS-OR-MINUS .357 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 194.27 PLUS-OR-MINUS 28.40 MB

RELATED DATA

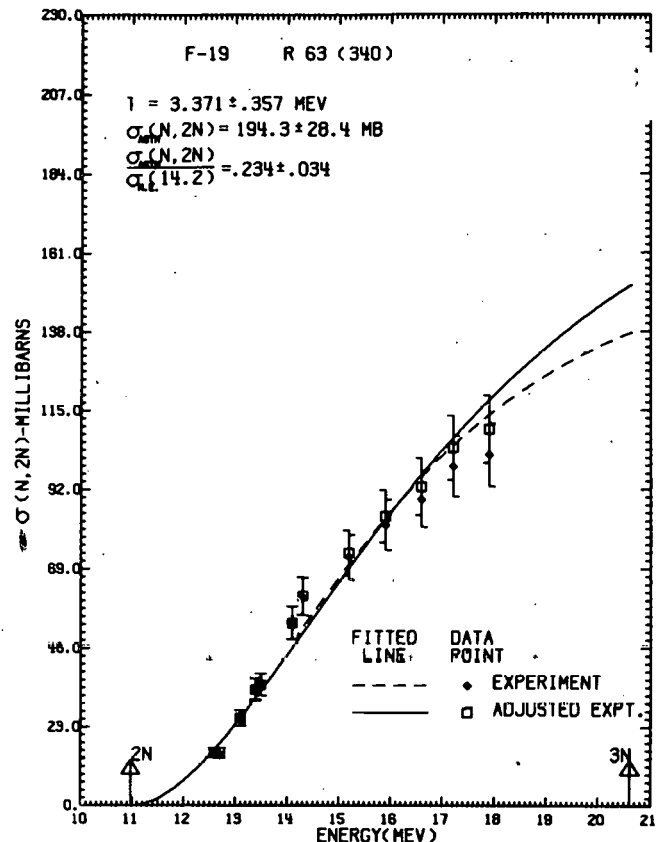
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV

THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)

NEUTRON EXCESS PARAMETER = .05263

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .2338 PLUS-OR-MINUS .0342

T=SQRT(N) = 10.660 T=SQRT(A) = 14.694
 ERROR 1.129 ERROR 1.556



F-19 FROM REF. R 63 (340)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12,600	15,40	1,40	15,400	1,400	
12,700	15,30	1,40	15,300	1,400	
13,100	25,50	2,30	25,500	2,300	
13,400	33,90	3,10	33,900	3,100	
13,500	35,20	3,20	35,200	3,200	
14,100	53,20	4,80	53,200	4,800	
14,300	60,90	5,50	61,004	5,509	
15,200	72,30	6,50	73,548	6,612	
15,900	81,70	7,40	84,119	7,619	
16,600	89,00	8,00	92,755	8,338	
17,200	98,70	8,90	104,132	9,390	
17,900	102,00	9,20	109,520	9,878	

FITTED PARAMETERS

LEVEL SPACING = .610 PLUS-OR-MINUS .213 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 329.01 PLUS-OR-MINUS 89.04 MB

RELATED DATA

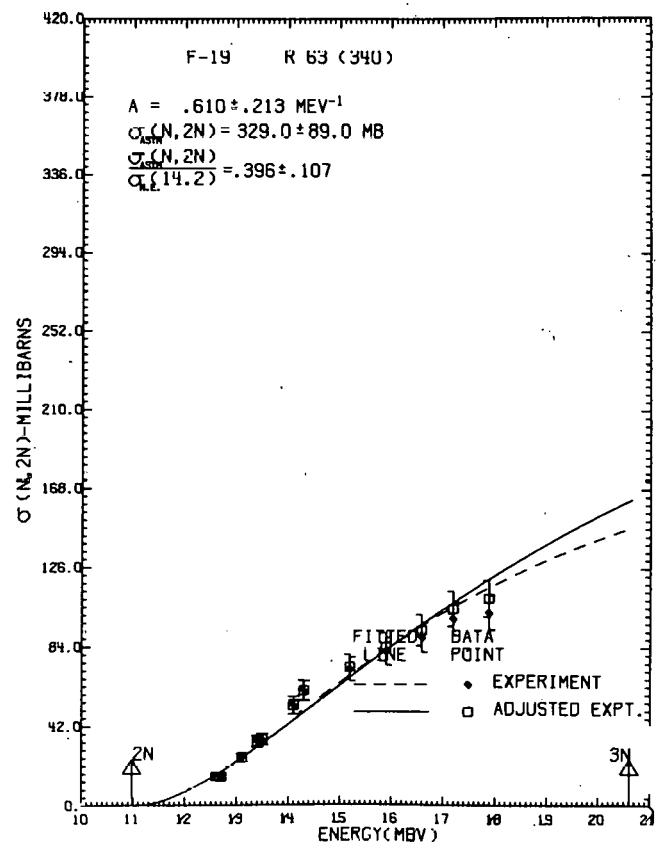
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV

THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)

NEUTRON EXCESS PARAMETER = .05263

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .3960 PLUS-OR-MINUS .1072

N/SPACING = 16.393 A/SPACING = 31.148
 ERROR 5.724 ERROR 10.876

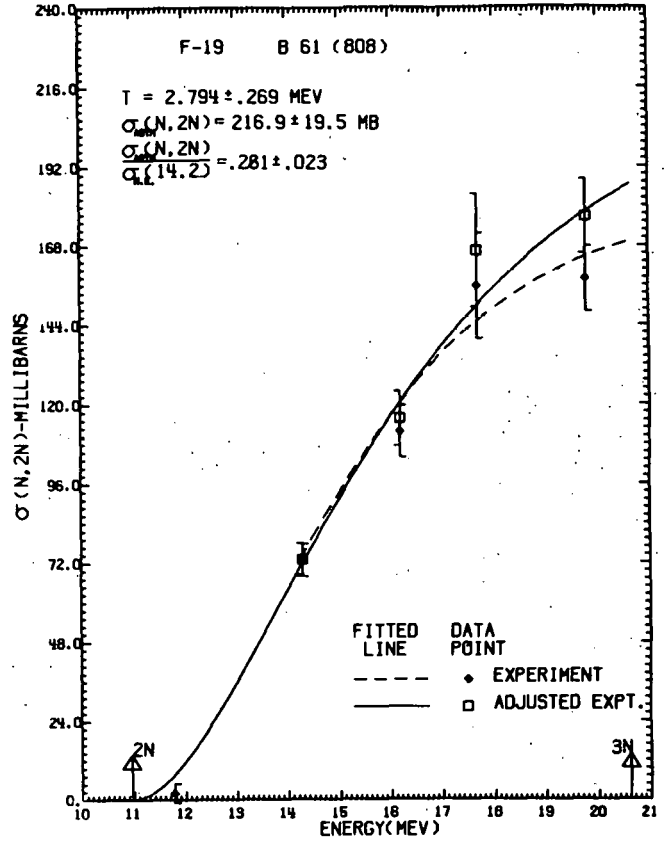


F-19 ... FROM REF. B 61 (808)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB) ADJUSTED	ERR
14.300	73.00	5.00	73.125	5.009
16.200	112.00	8.00	115.917	8.280
17.700	156.00	16.00	166.683	17.096
19.800	158.00	10.00	176.993	11.202

FITTED PARAMETERS
 NUCLEAR TEMP. = 2.794 PLUS-OR-MINUS .269 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 216.92 PLUS-OR-MINUS 19.50 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV
 THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)
 NEUTRON EXCESS PARAMETER = .05263
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .2611 PLUS-OR-MINUS .0235
 T*SORT(N) = 8.835 ERROR .851
 T*SORT(A) = 12.179 ERROR 1.173

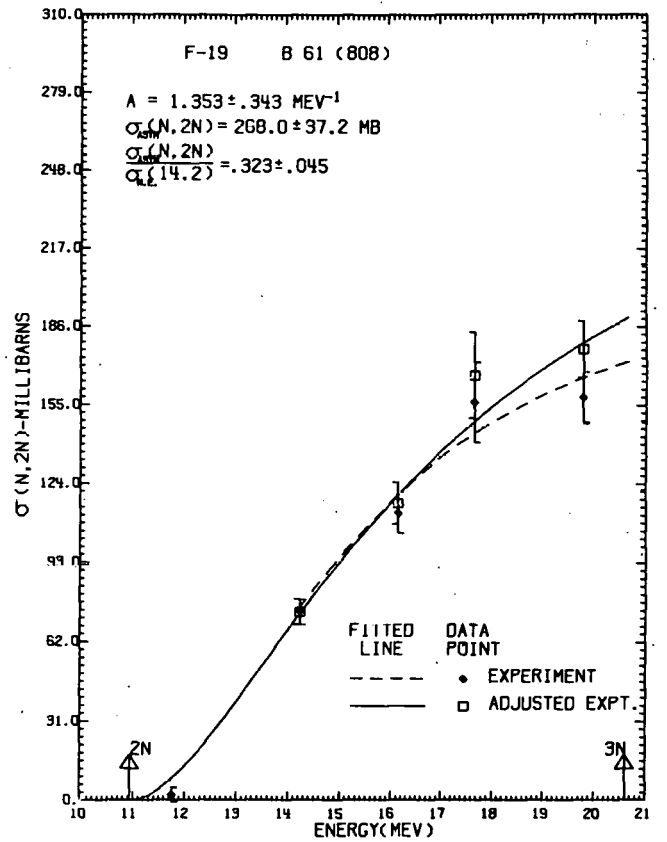


F-19 ... FROM REF. B 61 (808)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB) ADJUSTED	ERR
14.300	73.00	5.00	73.125	5.009
16.200	112.00	8.00	115.917	8.280
17.700	156.00	16.00	166.683	17.096
19.800	158.00	10.00	176.993	11.202

FITTED PARAMETERS
 LEVEL SPACING = 1.353 PLUS-OR-MINUS .313 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 268.03 PLUS-OR-MINUS 37.19 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV
 THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)
 NEUTRON EXCESS PARAMETER = .05263
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .3226 PLUS-OR-MINUS .0448
 N/SPACING = 7.391 ERROR 1.874
 A/SPACING = 14.043 ERROR 3.560



F-19 FROM REF. W 61 (710)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED, ERR			
12,400	45,00	15,00	45,000	15,000
13,500	54,00	150,00	54,000	150,000
14,500	67,00	150,00	67,344	150,770
16,100	88,00	150,00	90,920	154,977
16,900	1190,00	100,00	1246,701	104,765
19,500	1150,00	70,00	1280,250	77,928
20,500	1110,00	70,00	1260,815	79,511

FITTED PARAMETERS

NUCLEAR TEMP. = 6.674 PLUS-OR-MINUS 5.374 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 3306.64 PLUS-OR-MINUS 3365.29 MB

RELATED DATA

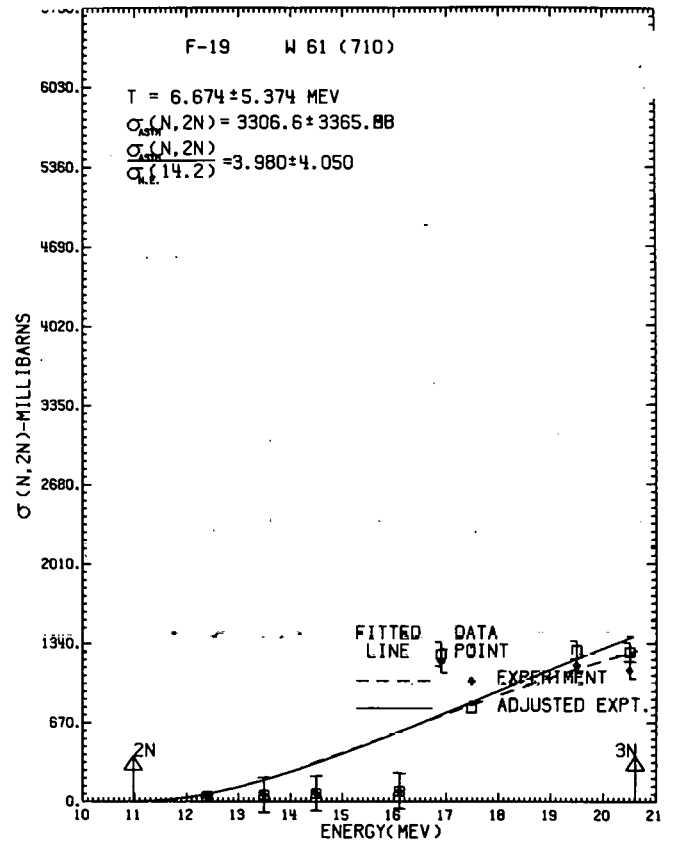
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV

THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)

NEUTRON EXCESS PARAMETER = .05263

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 3.9796 PLUS-OR-MINUS 4.0502

T-COUNT(N) = 04.10F T-COUNT(A) = 20.901
 ERROR 16.994 ERROR 23.425



NO "A" FIT POSSIBLE

F-19 FROM REF. P 60 (1720)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13,200	39.00	4.00	39.000	4.000
13,600	46.00	5.00	46.000	5.000
13,850	50.00	5.00	50.000	5.000
14,150	55.00	5.00	55.000	5.000
14,400	61.00	6.00	61.208	6.021
14,700	68.00	7.00	68.583	7.060
14,950	75.00	7.00	75.968	7.090
15,350	83.00	8.00	84.651	8.159

FITTED PARAMETERS

NUCLEAR TEMP. = 2,252 PLUS-OR-MINUS .248 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 140.77 PLUS-OR-MINUS 17.99 MB

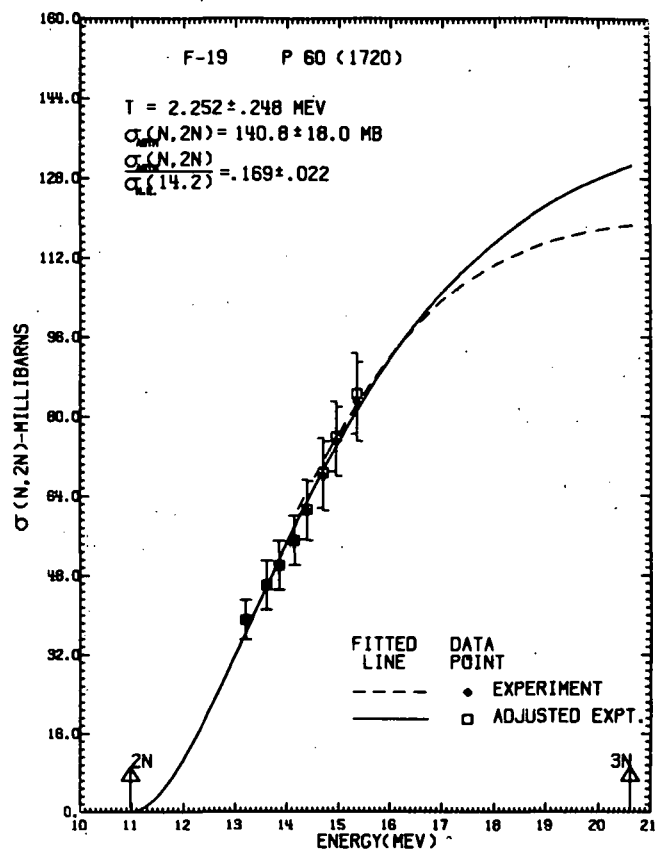
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV

THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)
 NEUTRON EXCESS PARAMETER = .05263

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .1694 PLUS-OR-MINUS .0216

T*SQRT(N) = 7.121 T*SQRT(A) = 9.816
 ERROR .784 ERROR 1.081



F-19 FROM REF. P 60 (1720)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13,200	39.00	4.00	39.000	4.000
13,600	46.00	5.00	46.000	5.000
13,850	50.00	5.00	50.000	5.000
14,150	55.00	5.00	55.000	5.000
14,400	61.00	6.00	61.208	6.021
14,700	68.00	7.00	68.583	7.060
14,950	75.00	7.00	75.968	7.090
15,350	83.00	8.00	84.651	8.159

FITTED PARAMETERS

LEVEL SPACING = 1.786 PLUS-OR-MINUS .484 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 185.82 PLUS-OR-MINUS 32.92 MB

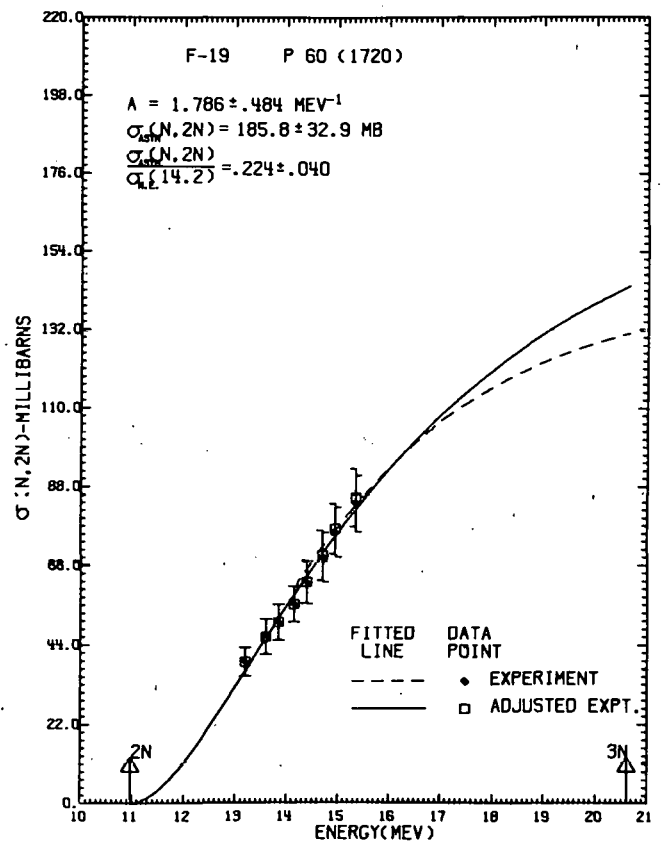
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 830.90 MB
 (N,2N) THRESHOLD = 10.98 MEV
 (N,3N) THRESHOLD = 20.61 MEV

THIS ISOTOPE HAS 10 NEUTRONS, 9 PROTONS, (MASS = 19)
 NEUTRON EXCESS PARAMETER = .05263

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .2236 PLUS-OR-MINUS .0396

N/SPACING = 5.599 A/SPACING = 10.638
 ERROR 1.517 ERROR 2.883



NA-23 ...FROM REF. M 67 (1686)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.960	43.10 6.40	44.123	6.552
15.820	50.60 13.20	53.081	13.847
16.520	79.70 11.60	85.195	12.394
17.350	87.00 18.60	94.847	20.278
18.440	90.90 10.90	101.517	12.173
19.390	99.10 11.80	112.805	13.432

FITTED PARAMETERS

NUCLEAR TEMP. = 1.621 PLUS-OR-MINUS .151 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 122.73 PLUS-OR-MINUS 8.59 MB

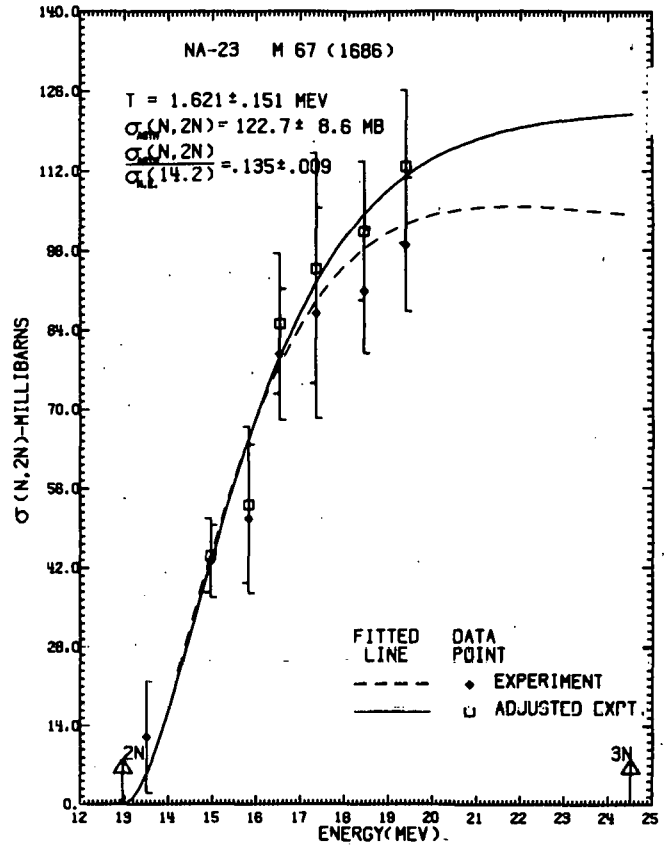
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 911.64 MB
 (N,2N) THRESHOLD = 12.96 MEV
 (N,3N) THRESHOLD = 24.51 MEV

THIS ISOTOPE HAS 12 NEUTRONS, 11 PROTONS, (MASS = 23)
 NEUTRON EXCESS PARAMETER = .04348

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .1346 PLUS-OR-MINUS .0094

T*SQRT(N) = 5.615 T*SQRT(A) = 7.774
 ERROR .523 ERROR .724



NA-23 ...FROM REF. M 67 (1686)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.960	43.10 6.40	44.123	6.552
15.820	50.60 13.20	53.081	13.847
16.520	79.70 11.60	85.195	12.394
17.350	87.00 18.60	94.847	20.278
18.440	90.90 10.90	101.517	12.173
19.390	99.10 11.80	112.805	13.432

FITTED PARAMETERS

LEVEL SPACING = 5.083 PLUS-OR-MINUS 1.077 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 133.26 PLUS-OR-MINUS 11.79 MB

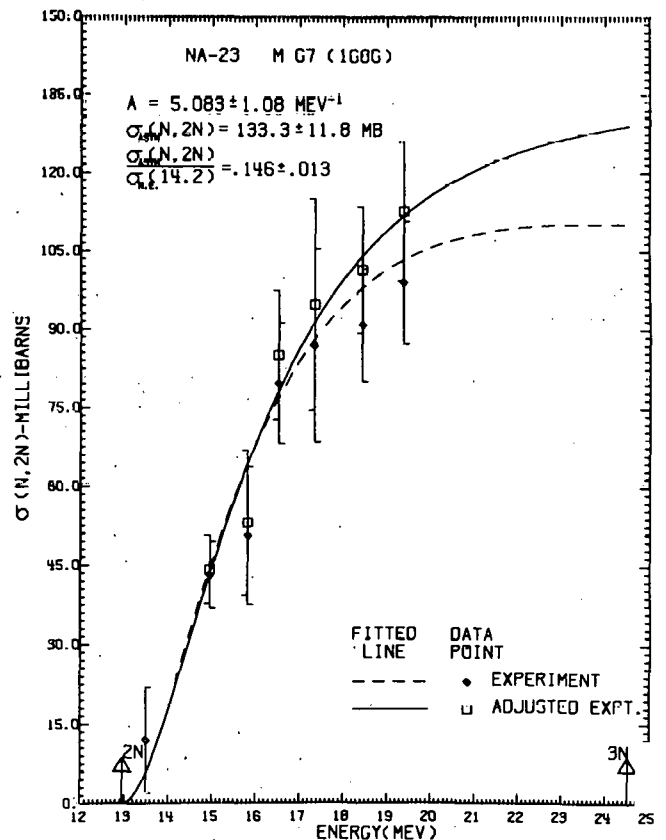
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 911.84 MB
 (N,2N) THRESHOLD = 12.96 MEV
 (N,3N) THRESHOLD = 24.51 MEV

THIS ISOTOPE HAS 12 NEUTRONS, 11 PROTONS, (MASS = 23)
 NEUTRON EXCESS PARAMETER = .04348

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .1461 PLUS-OR-MINUS .0129

N/SPACING = 2.361 A/SPACING = 4.525
 ERROR .500 ERROR .959



NA-23 ...FROM REF. L 65 (893)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
14.420	44.00	3.10	44.309	3.122
14.710	65.80	4.60	66.858	4.674
15.090	84.80	5.90	87.147	6.063
15.370	87.30	6.10	90.443	6.320
15.720	108.00	8.00	112.987	8.369
15.990	113.00	8.00	119.084	8.431
16.250	122.00	9.00	129.451	9.550
16.420	133.00	9.00	141.743	9.592
16.610	141.00	10.00	150.993	10.709
17.270	159.00	15.00	173.017	16.322
17.750	173.00	15.00	190.336	16.503
18.330	180.00	16.00	200.557	17.827
18.710	191.00	16.00	214.504	17.969
19.130	197.00	17.00	223.114	19.254
19.360	194.00	18.00	220.702	20.477
19.580	199.00	18.00	227.341	20.563

FITTED PARAMETERS

NUCLEAR TEMP. = 1.911 PLUS-OR-MINUS .062 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 263.03 PLUS-OR-MINUS 9.02 MB

RELATED DATA

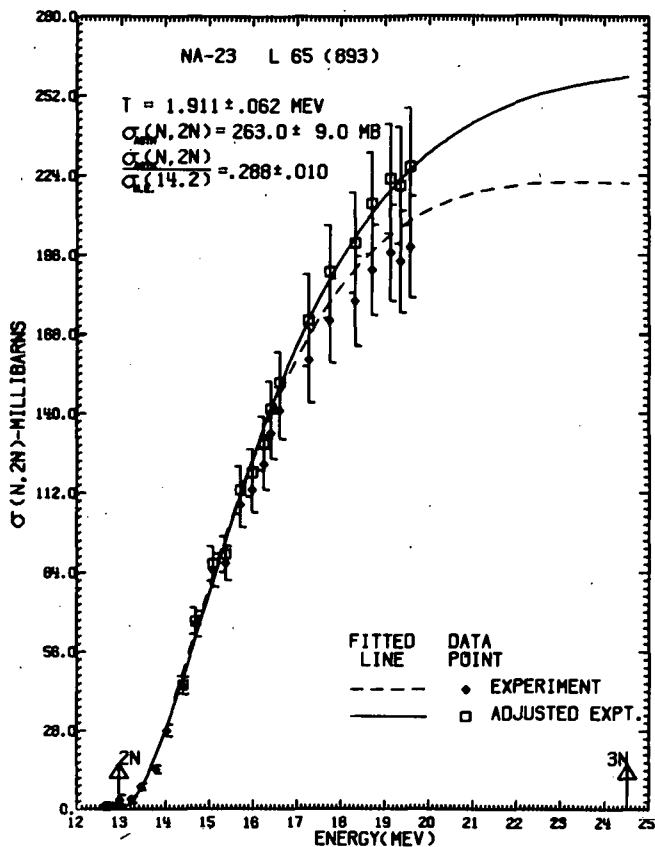
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 911.84 MB
 (N,2N) THRESHOLD = 12.96 MEV
 (N,3N) THRESHOLD = 24.51 MEV

THIS ISOTOPE HAS 12 NEUTRONS, 11 PROTONS, (MASS = 23)

NEUTRON EXCESS PARAMETER = .04348

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .2885 PLUS-OR-MINUS .0099

T*SQRT(N) = 6.620 T*SQRT(A) = 9.165
 ERROR .215 ERROR .297



NA-23 ...FROM REF. L 65 (893)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
14.420	44.00	3.10	44.309	3.122
14.710	65.80	4.60	66.858	4.674
15.090	84.80	5.90	87.147	6.063
15.370	87.30	6.10	90.443	6.320
15.720	108.00	8.00	112.987	8.369
15.990	113.00	8.00	119.084	8.431
16.250	122.00	9.00	129.451	9.550
16.420	133.00	9.00	141.743	9.592
16.610	141.00	10.00	150.993	10.709
17.270	159.00	15.00	173.017	16.322
17.750	173.00	15.00	190.336	16.503
18.330	180.00	16.00	200.557	17.827
18.710	191.00	16.00	214.504	17.969
19.130	197.00	17.00	223.114	19.254
19.360	194.00	18.00	220.702	20.477
19.580	199.00	18.00	227.341	20.563

FITTED PARAMETERS

LEVEL SPACING = 3.363 PLUS-OR-MINUS .259 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 303.00 PLUS-OR-MINUS 13.35 MB

RELATED DATA

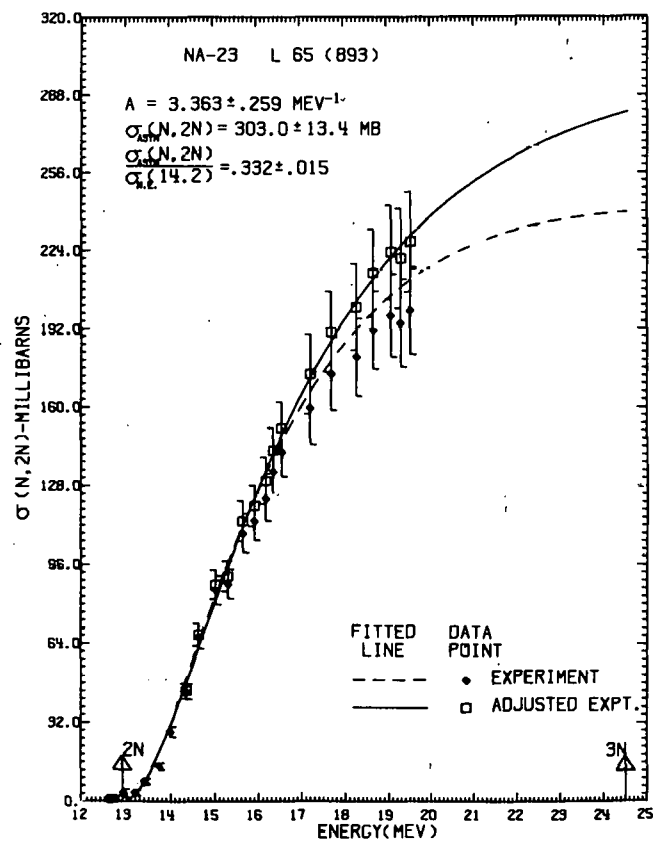
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 911.84 MB
 (N,2N) THRESHOLD = 12.96 MEV
 (N,3N) THRESHOLD = 24.51 MEV

THIS ISOTOPE HAS 12 NEUTRONS, 11 PROTONS, (MASS = 23)

NEUTRON EXCESS PARAMETER = .04348

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .3323 PLUS-OR-MINUS .0146

N/SPACING = 3.568 A/SPACING = 6.839
 ERROR .275 ERROR .527



NA-23 ... FROM REF. P165 (449)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
14.890	38.50	2.30	39.332	2.350
16.150	35.70	2.50	37.782	2.646
18.490	58.60	14.00	65.513	15.652
19.610	63.60	14.00	72.699	16.003
20.630	67.80	8.00	78.931	9.313
21.000	78.70	10.00	92.193	11.714

FITTED PARAMETERS

NUCLEAR TEMP. = 1.027 PLUS-OR-MINUS .416 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 58.94 PLUS-OR-MINUS 15.95 MB

RELATED DATA

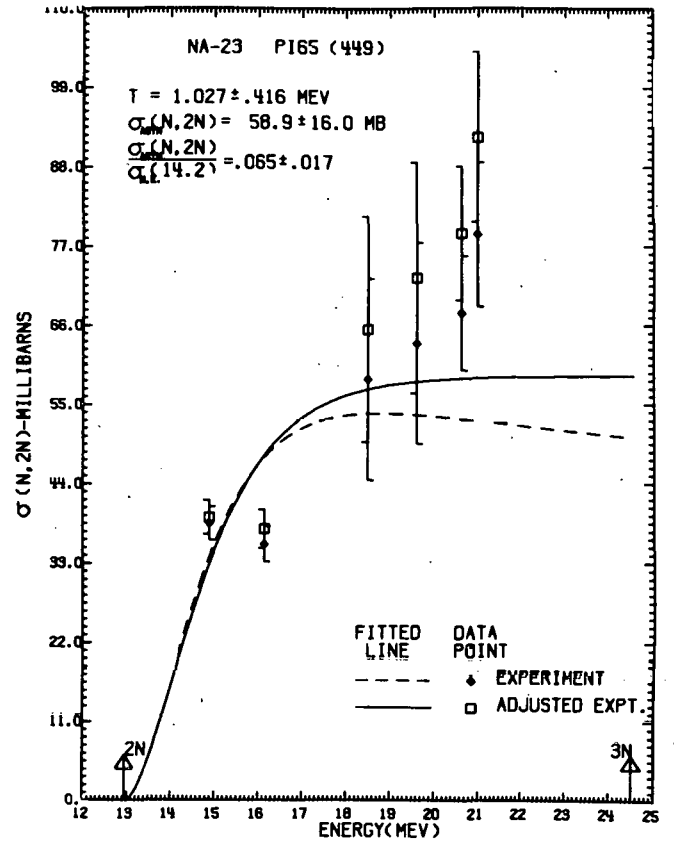
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 911.84 MB
 (N,2N) THRESHOLD = 12.96 MEV
 (N,3N) THRESHOLD = 24.51 MEV

THIS ISOTOPE HAS 12 NEUTRONS, 11 PROTONS, (MASS = 23)

NEUTRON EXCESS PARAMETER = .04348

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0646 PLUS-OR-MINUS .0175

T*SQRT(N) = 3.558 T*SQRT(A) = 4.925
 ERROR 1.441 ERROR 1.995



NA-23 ... FROM REF. P165 (449)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
14.890	38.50	2.30	39.332	2.350
16.150	35.70	2.50	37.782	2.646
18.490	58.60	14.00	65.513	15.652
19.610	63.60	14.00	72.699	16.003
20.630	67.80	8.00	78.931	9.313
21.000	78.70	10.00	92.193	11.714

FITTED PARAMETERS

LEVEL SPACING = 11.553 PLUS-OR-MINUS 8.940 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 63.92 PLUS-OR-MINUS 18.51 MB

RELATED DATA

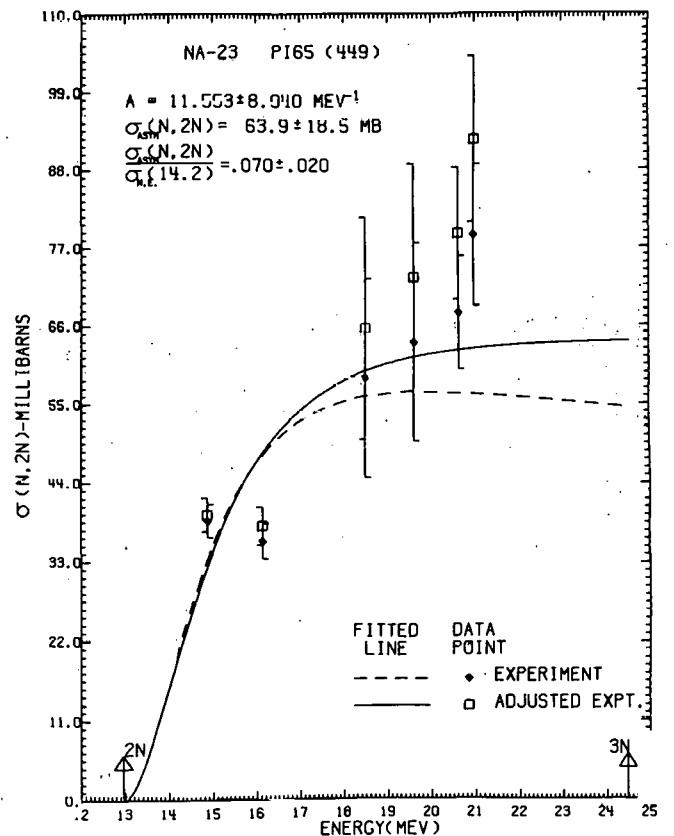
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 911.84 MB
 (N,2N) THRESHOLD = 12.96 MEV
 (N,3N) THRESHOLD = 24.51 MEV

THIS ISOTOPE HAS 12 NEUTRONS, 11 PROTONS, (MASS = 23)

NEUTRON EXCESS PARAMETER = .04348

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0701 PLUS-OR-MINUS .0203

N/SPACING = 1.039 A/SPACING = 1.991
 ERROR .804 ERROR 1.541



P-31 ... FROM REF. B 63 (417)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14,100	12,50	3,00	12,500	3,000
15,200	29,00	2,00	29,777	2,054
16,000	34,50	3,50	36,110	3,663
17,200	47,00	4,00	50,479	4,296
18,800	58,00	6,00	64,173	6,639
19,700	61,50	7,50	69,055	8,421

FITTED PARAMETERS

NUCLEAR TEMP. = 1,909 PLUS-OR-MINUS .133 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 75,80 PLUS-OR-MINUS 5,07 MB

RELATED DATA

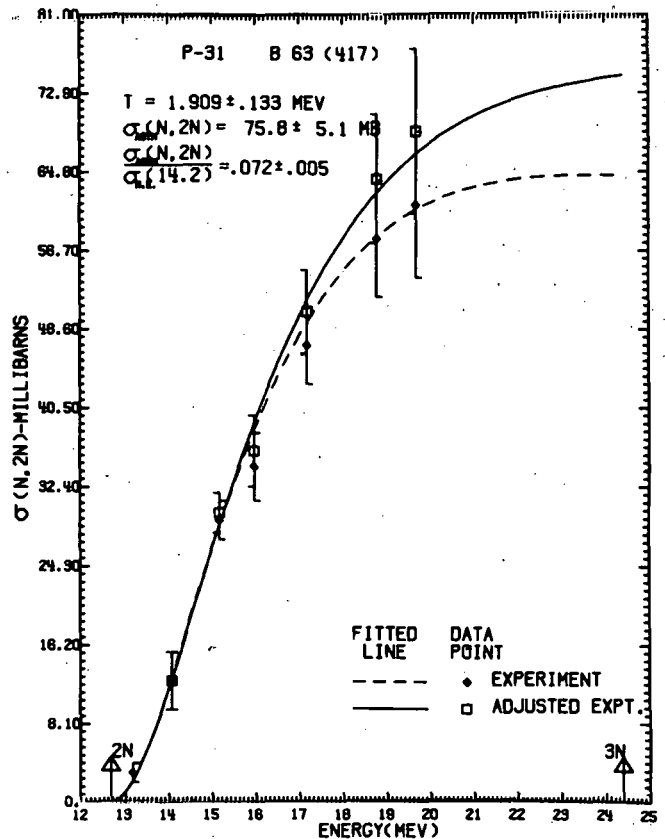
NON-ELASTIC CROSS SECTION AT 14,2 MEV = 1051,31 MB
 (N,2N) THRESHOLD = 12,70 MEV
 (N,3N) THRESHOLD = 24,39 MEV

THIS ISOTOPE HAS 16 NEUTRONS, 15 PROTONS, (MASS = 31)

NEUTRON EXCESS PARAMETER = .03226

RATIO OF ASYMPTOTIC (N,2N) TO 14,2 MEV NON-ELASTIC
 .0721 PLUS-OR-MINUS .0048

T*SQRT(N) = 7,636 T*SQRT(A) = 10,629
 ERROR .532 ERROR .741



P-31 ... FROM REF. B 63 (417)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14,100	12,50	3,00	12,500	3,000
15,200	29,00	2,00	29,777	2,054
16,000	34,50	3,50	36,110	3,663
17,200	47,00	4,00	50,479	4,296
18,800	58,00	6,00	64,173	6,639
19,700	61,50	7,50	69,055	8,421

FITTED PARAMETERS

LEVEL SPACING = 3,439 PLUS-OR-MINUS .506 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 85,81 PLUS-OR-MINUS 6,66 MB

RELATED DATA

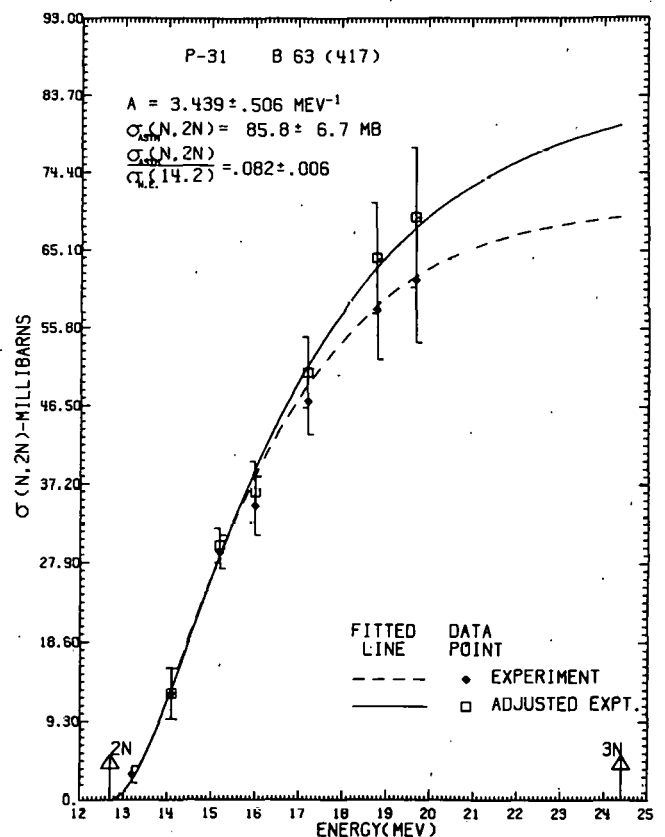
NON-ELASTIC CROSS SECTION AT 14,2 MEV = 1051,31 MB
 (N,2N) THRESHOLD = 12,70 MEV
 (N,3N) THRESHOLD = 24,39 MEV

THIS ISOTOPE HAS 16 NEUTRONS, 15 PROTONS, (MASS = 31)

NEUTRON EXCESS PARAMETER = .03226

RATIO OF ASYMPTOTIC (N,2N) TO 14,2 MEV NON-ELASTIC
 .0816 PLUS-OR-MINUS .0063

N/SPACING = 4,653 A/SPACING = 9,014
 ERROR .685 ERROR 1,326

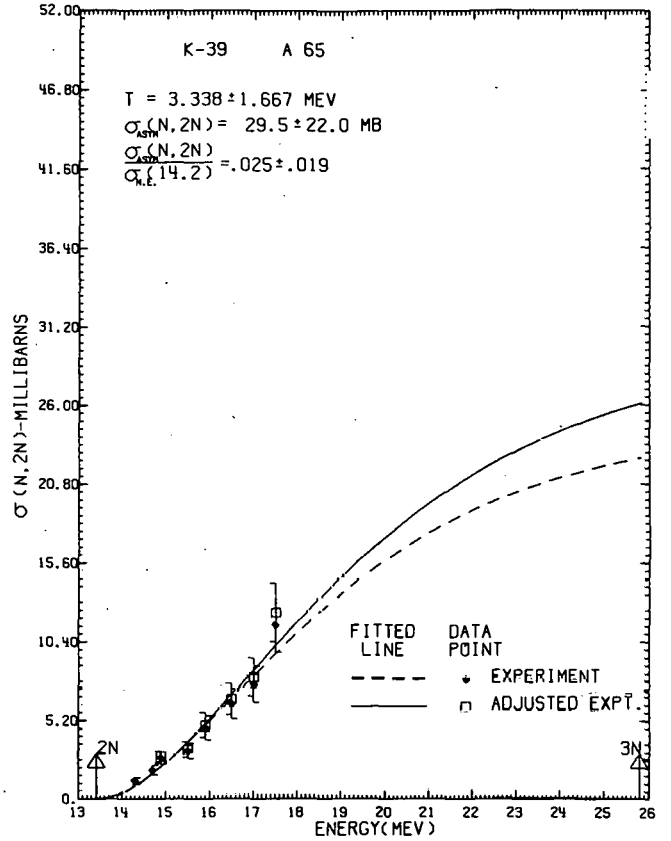


K-39 ... FROM REF. A 65

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.900	2.70 .40	2.745	.407
15.500	3.20 .50	3.297	.515
15.900	4.70 .80	4.883	.831
16.500	6.30 1.00	6.623	1.051
17.000	7.60 1.20	8.064	1.273
17.500	11.50 1.80	12.309	1.927

FITTED PARAMETERS
 NUCLEAR TEMP. = 3.338 PLUS-OR-MINUS 1.667 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 29.48 PLUS-OR-MINUS 22.03 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1170.31 MB
 (N,2N) THRESHOLD = 13.42 MEV
 (N,3N) THRESHOLD = 25.79 MEV
 THIS ISOTOPE HAS 20 NEUTRONS, 19 PROTONS, (MASS = 39)
 NEUTRON EXCESS PARAMETER = .02564
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .0252 PLUS-OR-MINUS .0188
 T=SQRT(N) = 14.928 ERROR 7.455 T=SQRT(A) = 20.846 ERROR 10.410

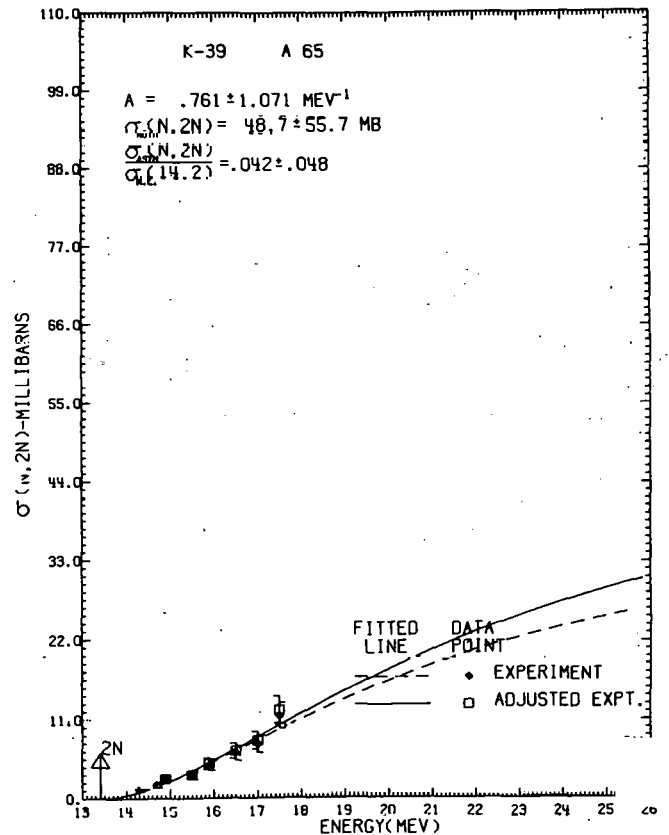


K-39 ... FROM REF. A 65

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.900	2.70 .40	2.745	.407
15.500	3.20 .50	3.297	.515
15.900	4.70 .80	4.883	.831
16.500	6.30 1.00	6.623	1.051
17.000	7.60 1.20	8.064	1.273
17.500	11.50 1.80	12.309	1.927

FITTED PARAMETERS
 LEVEL SPACING = .761 PLUS-OR-MINUS 1.071 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 48.67 PLUS-OR-MINUS 55.74 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1170.31 MB
 (N,2N) THRESHOLD = 13.42 MEV
 (N,3N) THRESHOLD = 25.79 MEV
 THIS ISOTOPE HAS 20 NEUTRONS, 19 PROTONS, (MASS = 39)
 NEUTRON EXCESS PARAMETER = .02564
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .0416 PLUS-OR-MINUS .0476
 N/SPACING = 26.281 ERROR 36.987 A/SPACING = 51.248 ERROR 72.125



K-39 ... FROM REF. B 65 (843)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
15.000	6.10	.60	6.217 .611
15.800	9.60	.80	9.954 .829
16.700	15.30	1.20	16.145 1.266
17.500	17.60	1.30	18.838 1.391
18.100	21.40	1.60	23.133 1.730
18.800	23.80	1.70	26.005 1.857

FITTED PARAMETERS

NUCLEAR TEMP. = 2.248 PLUS-OR-MINUS .197 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 36.76 PLUS-OR-MINUS 3.52 MB

RELATED DATA

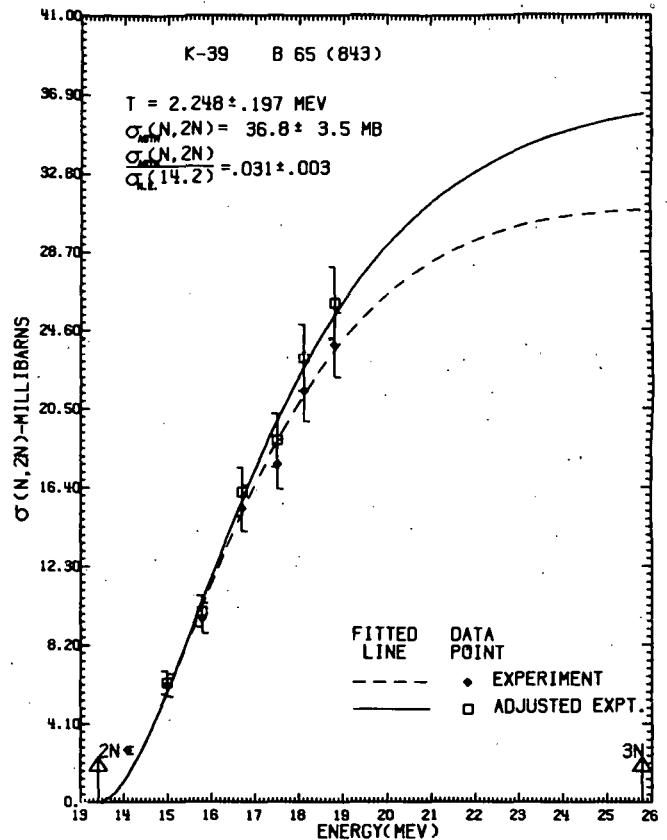
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1170.31 MB
 (N,2N) THRESHOLD = 13.42 MEV
 (N,3N) THRESHOLD = 25.79 MEV

THIS ISOTOPE HAS 20 NEUTRONS, 19 PROTONS, (MASS = 39)

NEUTRON EXCESS PARAMETER = .02564

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0314 PLUS-OR-MINUS .0030

T*SQRT(N) = 10.053 T*SQRT(A) = 14.039
 ERROR .861 ERROR 1.230



K-39 ... FROM REF. B 65 (843)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
15.000	6.10	.60	6.217 .611
15.800	9.60	.80	9.954 .829
16.700	15.30	1.20	16.145 1.266
17.500	17.60	1.30	18.838 1.391
18.100	21.40	1.60	23.133 1.730
18.800	23.80	1.70	26.005 1.857

FITTED PARAMETERS

LEVEL SPACING = 2.301 PLUS-OR-MINUS .460 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 45.52 PLUS-OR-MINUS 5.57 MB

RELATED DATA

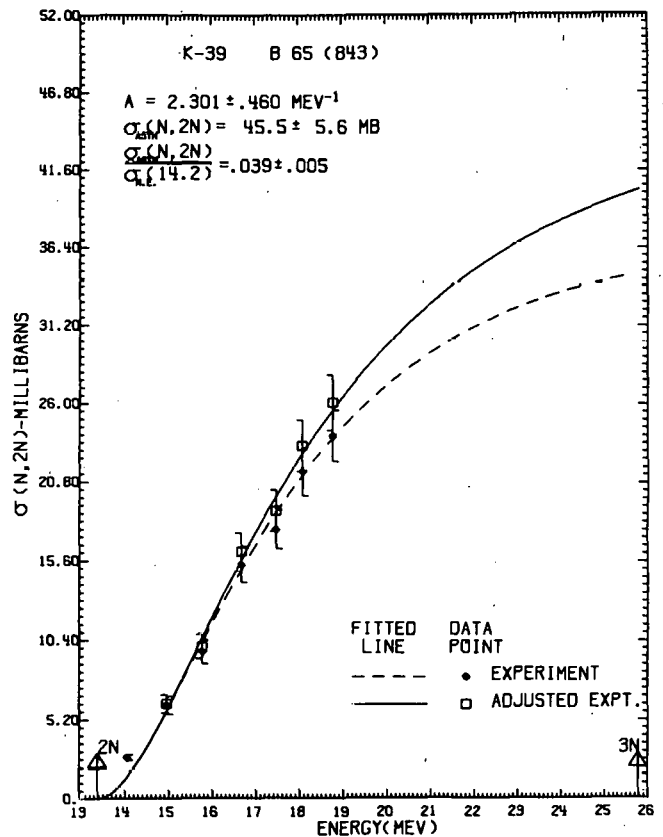
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1170.31 MB
 (N,2N) THRESHOLD = 13.42 MEV
 (N,3N) THRESHOLD = 25.79 MEV

THIS ISOTOPE HAS 20 NEUTRONS, 19 PROTONS, (MASS = 39)

NEUTRON EXCESS PARAMETER = .02564

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0389 PLUS-OR-MINUS .0048

N/SPACING = 8.692 A/SPACING = 16.949
 ERROR 1.738 ERROR 3.388

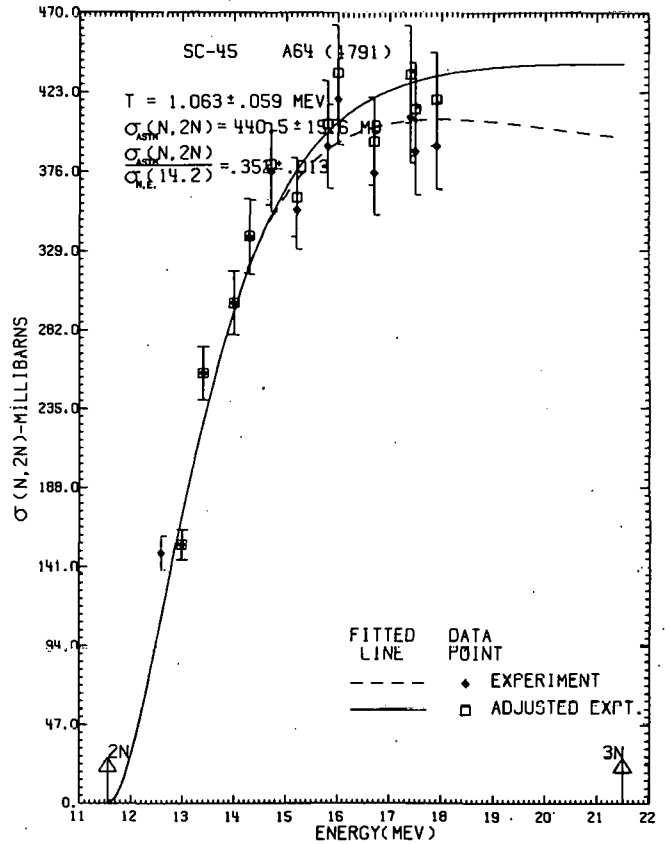


SC-45 ...FROM REF. A64 (1791)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.000	154.00	9.00	154.000	9.000
13.400	256.00	16.00	256.000	16.000
14.000	298.00	19.00	298.000	19.000
14.300	337.00	22.00	337.767	22.050
14.700	376.00	24.00	380.195	24.268
15.200	353.00	23.00	360.683	23.501
15.800	391.00	25.00	404.219	25.845
16.000	419.00	27.00	434.782	28.017
16.700	375.00	25.00	393.964	26.264
17.400	408.00	27.00	433.541	28.690
17.500	388.00	26.00	412.930	27.671
17.900	391.00	26.00	418.642	27.838

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.063 PLUS-OR-MINUS .059 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 440.51 PLUS-OR-MINUS 15.64 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1250.12 MB
 (N,2N) THRESHOLD = 11.57 MEV
 (N,3N) THRESHOLD = 21.49 MEV
 THIS ISOTOPE HAS 24 NEUTRONS, 21 PROTONS, (MASS = 45)
 NEUTRON EXCESS PARAMETER = .06667
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .3524 PLUS-OR-MINUS .0125
 T*SQRT(N) = 5.206 ERROR .289
 T*SQRT(A) = 7.131 ERROR .396

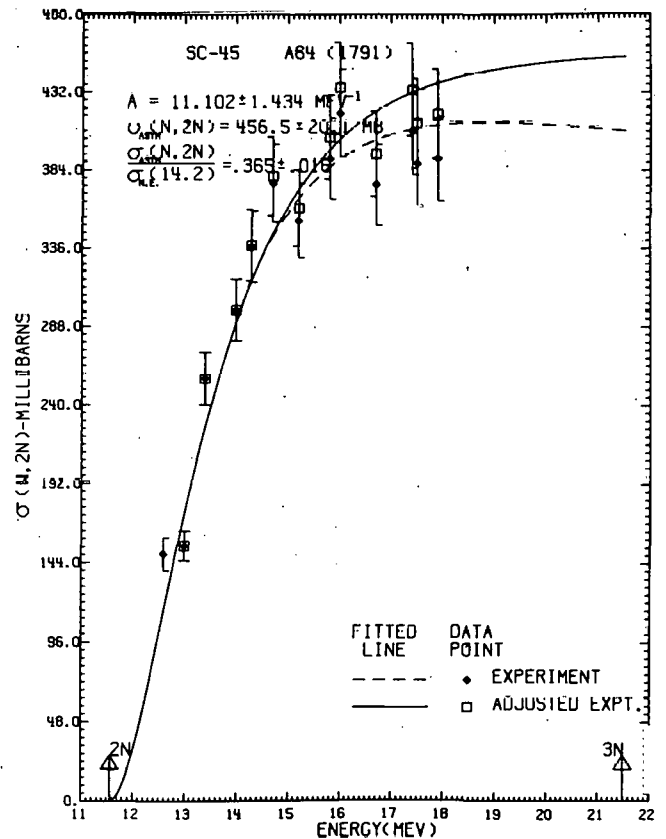


SC-45 ...FROM REF. A64 (1791)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.000	154.00	9.00	154.000	9.000
13.400	256.00	16.00	256.000	16.000
14.000	298.00	19.00	298.000	19.000
14.300	337.00	22.00	337.767	22.050
14.700	376.00	24.00	380.195	24.268
15.200	353.00	23.00	360.683	23.501
15.800	391.00	25.00	404.219	25.845
16.000	419.00	27.00	434.782	28.017
16.700	375.00	25.00	393.964	26.264
17.400	408.00	27.00	433.541	28.690
17.500	388.00	26.00	412.930	27.671
17.900	391.00	26.00	418.642	27.838

FITTED PARAMETERS
 LEVEL SPACING = 11.102 PLUS-OR-MINUS 1.434 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 456.46 PLUS-OR-MINUS 20.12 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1250.12 MB
 (N,2N) THRESHOLD = 11.57 MEV
 (N,3N) THRESHOLD = 21.49 MEV
 THIS ISOTOPE HAS 24 NEUTRONS, 21 PROTONS, (MASS = 45)
 NEUTRON EXCESS PARAMETER = .06667
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .3651 PLUS-OR-MINUS .0161
 N/SPACING = 2.162 ERROR .279
 A/SPACING = 4.053 ERROR .524



SC-45 ...FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.400	161.00	4.10	161.000	4.100	
13.690	203.80	5.20	203.800	5.200	
14.010	245.90	6.30	245.900	6.300	
14.090	266.20	6.80	266.200	6.800	
14.310	296.30	7.60	297.042	7.619	
14.500	319.70	8.10	317.835	8.155	
14.680	349.00	9.00	352.742	9.096	
16.500	454.00	16.40	475.326	17.170	
17.950	507.90	18.30	544.206	19.608	
19.760	507.90	18.30	557.415	20.084	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.778 PLUS-OR-MINUS .084 MEV
ASYMPTOTIC (N,2N) CROSS SECTION = 626.48 PLUS-OR-MINUS 32.49 MB

RELATED DATA

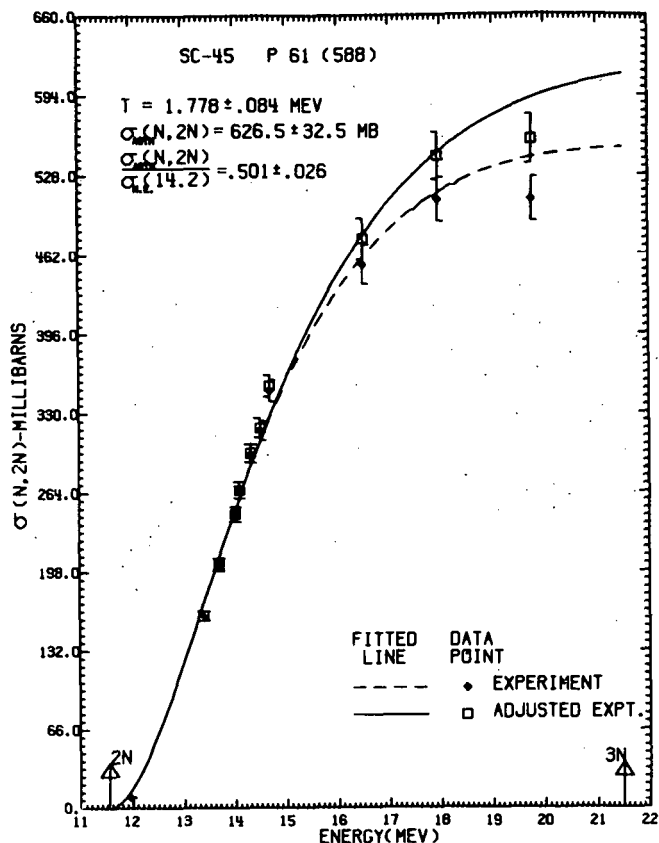
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1250.12 MB
(N,2N) THRESHOLD = 11.57 MEV
(N,3N) THRESHOLD = 21.49 MEV

THIS ISOTOPE HAS 24 NEUTRONS, 21 PROTONS, (MASS = 45)

NEUTRON EXCESS PARAMETER = .06667

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
.5011 PLUS-OR-MINUS .0260

T=SQRT(N) = 8.710 T=SQRT(A) = 11.927
ERROR .412 ERROR .563



SC-45 ...FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.400	161.00	4.10	161.000	4.100	
13.690	203.80	5.20	203.800	5.200	
14.010	245.90	6.30	245.900	6.300	
14.090	266.20	6.80	266.200	6.800	
14.310	296.30	7.60	297.042	7.619	
14.500	319.70	8.10	317.835	8.155	
14.680	349.00	9.00	352.742	9.096	
16.500	454.00	16.40	475.326	17.170	
17.950	507.90	18.30	544.206	19.608	
19.760	507.90	18.30	557.415	20.084	

FITTED PARAMETERS

LEVEL SPACING = 3.746 PLUS-OR-MINUS .500 PER MEV
ASYMPTOTIC (N,2N) CROSS SECTION = 693.32 PLUS-OR-MINUS 53.53 MB

RELATED DATA

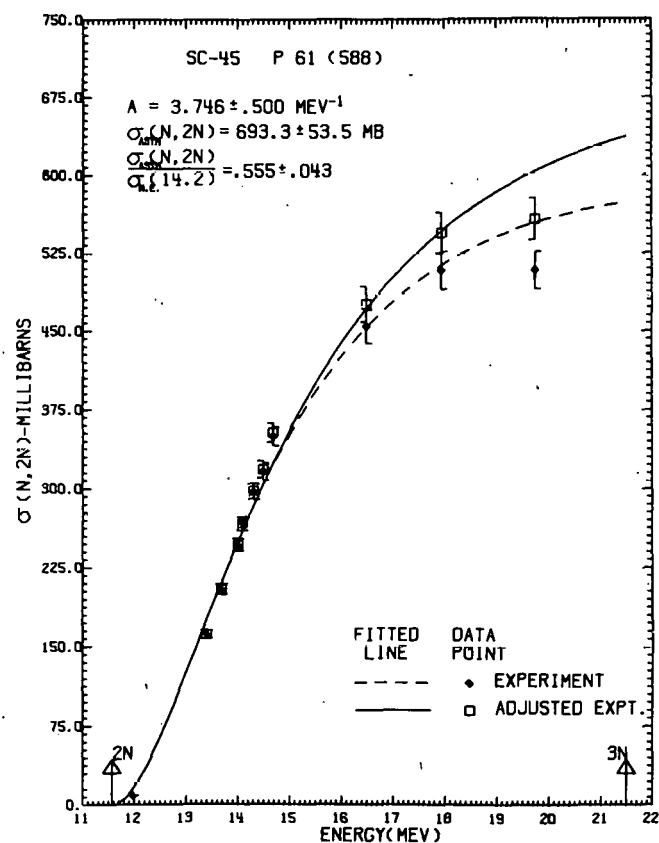
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1250.12 MB
(N,2N) THRESHOLD = 11.57 MEV
(N,3N) THRESHOLD = 21.49 MEV

THIS ISOTOPE HAS 24 NEUTRONS, 21 PROTONS, (MASS = 45)

NEUTRON EXCESS PARAMETER = .06667

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
.5546 PLUS-OR-MINUS .0428

N/SPACING = 6.407 A/SPACING = 12.013
ERROR .855 ERROR 1.603



TI-46 ...FROM REF. P 66 (1799)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
16.000	100.00 10.00	103.715	10.371
17.300	170.00 14.00	180.210	14.841
19.500	250.00 25.00	273.149	27.315

FITTED PARAMETERS

NUCLEAR TEMP. = 2.548 PLUS-OR-MINUS .112 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 402.66 PLUS-OR-MINUS 19.99 MB

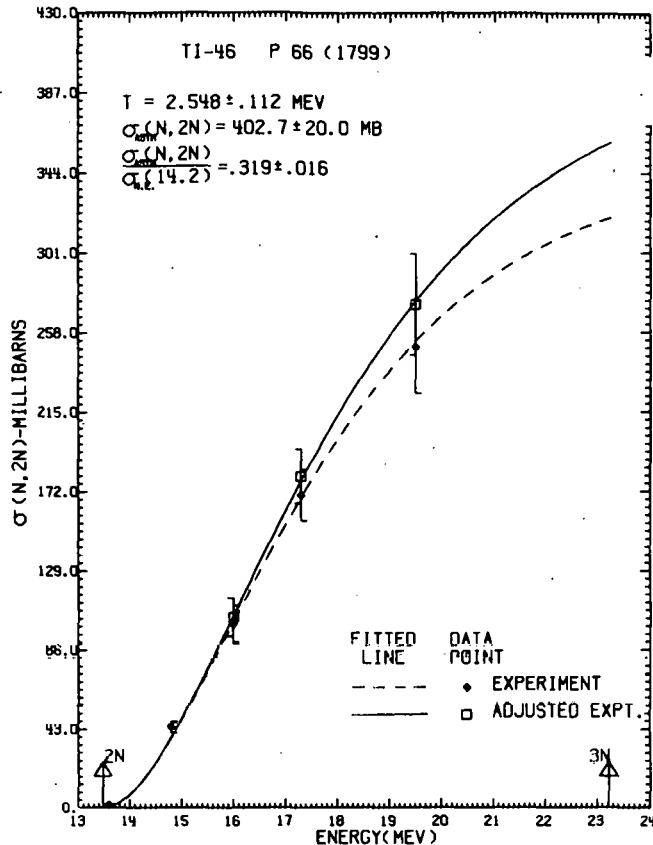
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1262.79 MB
 (N,2N) THRESHOLD = 13.48 MEV
 (N,3N) THRESHOLD = 23.22 MEV

THIS ISOTOPE HAS 24 NEUTRONS, 22 PROTONS, (MASS = 46)
 NEUTRON EXCESS PARAMETER = .04348

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .3189 PLUS-OR-MINUS .0156

TOSORT(N) = 12.483 TOSORT(A) = 17.281
 ERROR .549 ERROR .760



TI-46 ...FROM REF. P 66 (1799)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
16.000	100.00 10.00	103.715	10.371
17.300	170.00 14.00	180.210	14.841
19.500	250.00 25.00	273.149	27.315

FITTED PARAMETERS

LEVEL SPACING = 1.817 PLUS-OR-MINUS .300 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 503.83 PLUS-OR-MINUS 52.35 MB

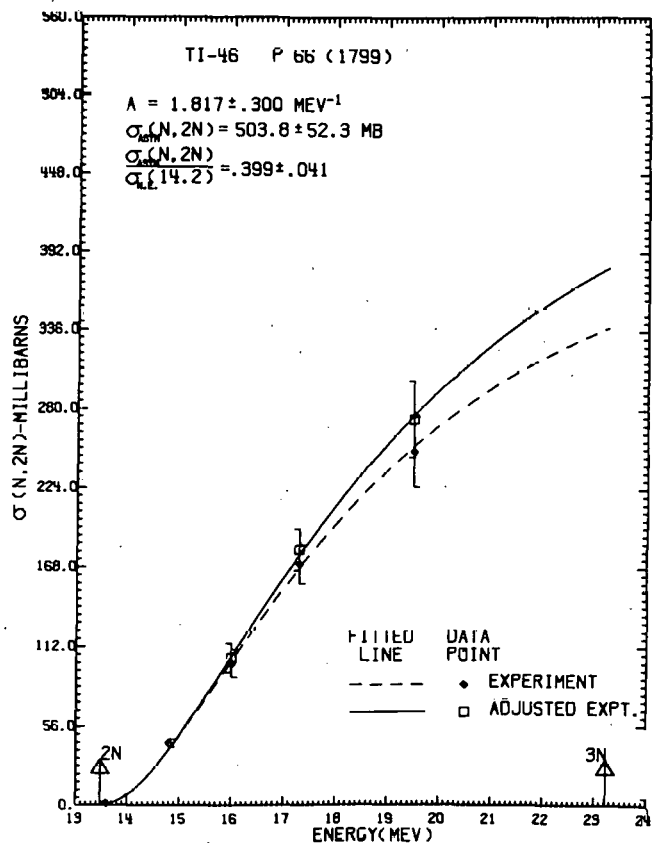
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1262.79 MB
 (N,2N) THRESHOLD = 13.48 MEV
 (N,3N) THRESHOLD = 23.22 MEV

THIS ISOTOPE HAS 24 NEUTRONS, 22 PROTONS, (MASS = 46)
 NEUTRON EXCESS PARAMETER = .04348

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .3990 PLUS-OR-MINUS .0415

N/SPACING = 13.209 A/SPACING = 25.316
 ERROR 2.181 ERROR 4.180

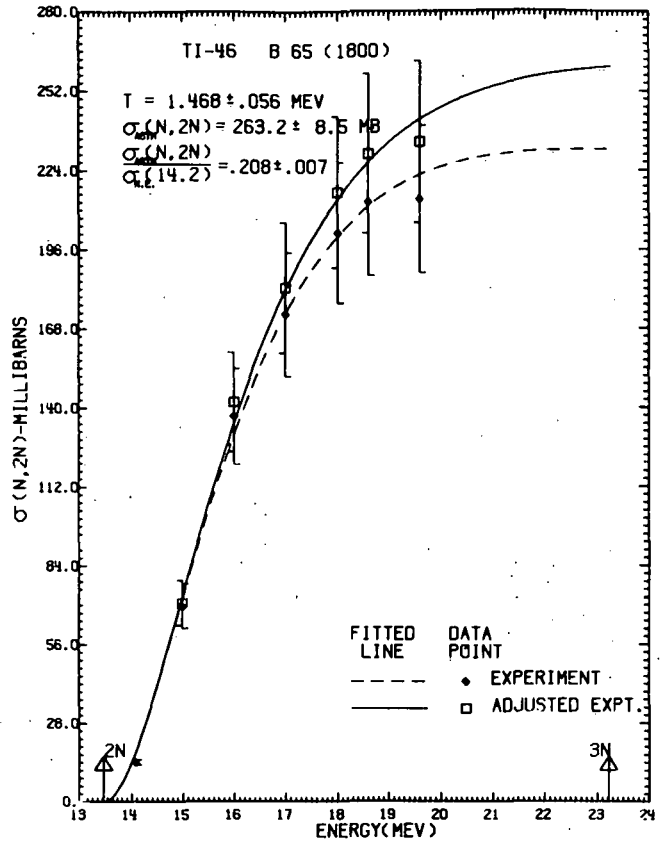


TI-46 ... FROM REF. B 65 (1800)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
15.000	69.50 8.00	70.706	8.139
16.000	137.00 17.00	142.089	17.632
17.000	173.00 22.00	182.921	23.211
18.000	202.00 25.00	216.384	26.780
18.400	213.00 26.00	230.073	28.084
19.600	214.00 26.00	234.097	28.442

FITTED PARAMETERS
 NUCLEAR TUMP, = 1.468 PLUS-OR-MINUS .056 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 263.22 PLUS-OR-MINUS 8.47 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1262.79 MB
 (N,2N) THRESHOLD = 13.48 MEV
 (N,3N) THRESHOLD = 23.22 MEV
 THIS ISOTOPE HAS 24 NEUTRONS, 22 PROTONS, (MASS = 46)
 NEUTRON EXCESS PARAMETER = .04346
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .2084 PLUS-OR-MINUS .0007
 T=SGRT(N) = 7.192 T=SGRT(A) = 9.956
 ERROR .274 ERROR .380

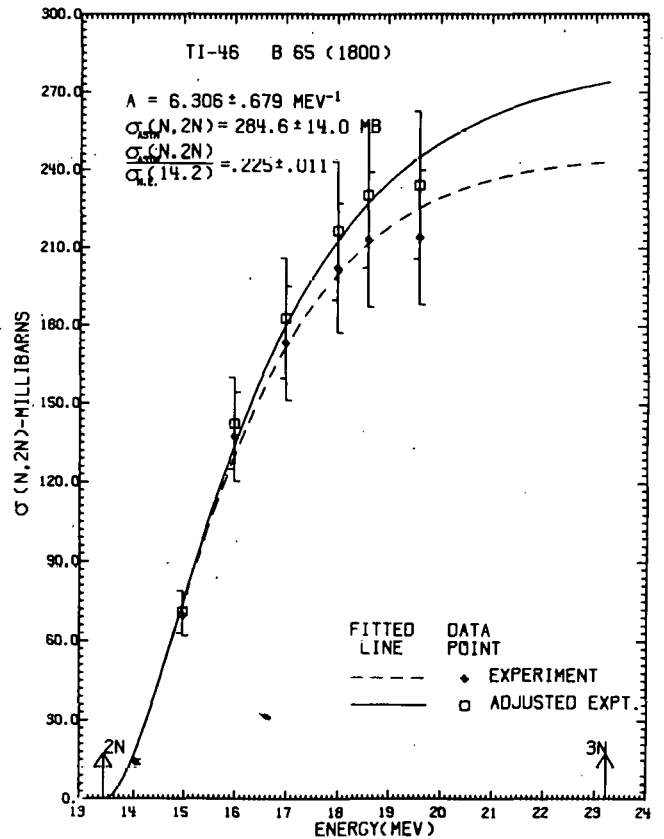


TI-46 ... FROM REF. B 65 (1800)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
15.000	69.50 8.00	70.706	8.139
16.000	137.00 17.00	142.089	17.632
17.000	173.00 22.00	182.921	23.211
18.000	202.00 25.00	216.384	26.780
18.400	213.00 26.00	230.073	28.084
19.600	214.00 26.00	234.097	28.442

FITTED PARAMETERS
 LEVEL SPACING = 6.306 PLUS-OR-MINUS .679 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 284.56 PLUS-OR-MINUS 13.99 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1262.79 MB
 (N,2N) THRESHOLD = 13.48 MEV
 (N,3N) THRESHOLD = 23.22 MEV
 THIS ISOTOPE HAS 24 NEUTRONS, 22 PROTONS, (MASS = 46)
 NEUTRON EXCESS PARAMETER = .04346
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .2253 PLUS-OR-MINUS .0111
 N/SPACING = 3.806 A/SPACING = 7.295
 ERROR .410 ERROR .785



TI-46 ... FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.930	44.50 3.00	45.207	3.048
16.500	145.00 7.00	151.716	7.324
17.950	185.00 9.00	198.031	9.634
19.760	233.90 12.00	256.351	13.152

FITTED PARAMETERS

NUCLEAR TEMP. = 2.133 PLUS-OR-MINUS .292 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 329.15 PLUS-OR-MINUS 47.32 MB

RELATED DATA

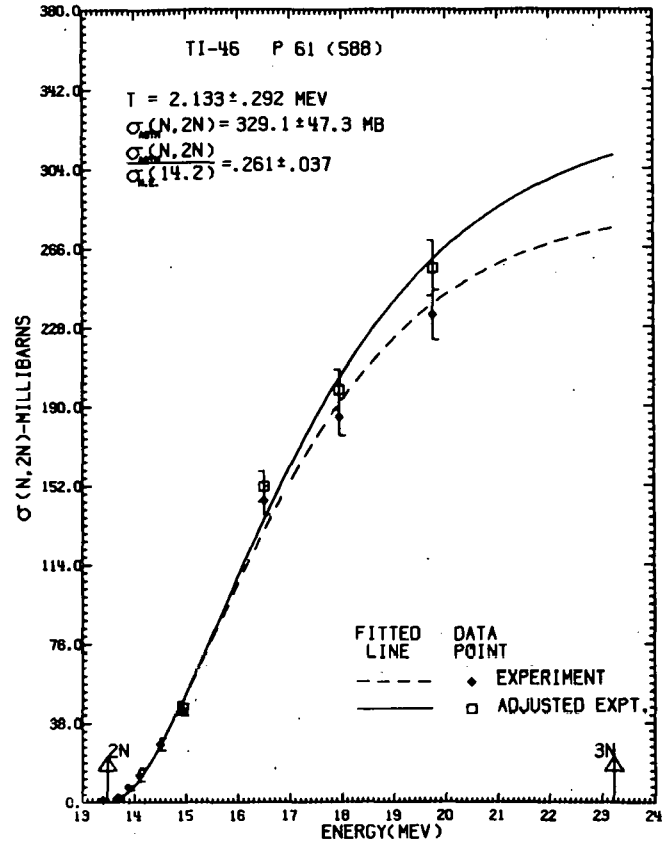
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1262.79 MB
 (N,2N) THRESHOLD = 13.46 MEV
 (N,3N) THRESHOLD = 23.22 MEV

THIS ISOTOPE HAS 24 NEUTRONS, 22 PROTONS, (MASS = 46)

NEUTRON EXCESS PARAMETER = .04346

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .2606 PLUS-OR-MINUS .0375

T*SOFT(N) = 10.450 T*SOFT(A) = 14.467
 ERROR 1.431 ERROR 1.980



TI-46 ... FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.930	44.90 3.00	45.207	3.048
16.500	145.00 7.00	151.716	7.324
17.950	185.00 9.00	198.031	9.634
19.760	233.90 12.00	256.351	13.152

FITTED PARAMETERS

LEVEL SPACING = 2.655 PLUS-OR-MINUS .971 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 394.02 PLUS-OR-MINUS 83.98 MB

RELATED DATA

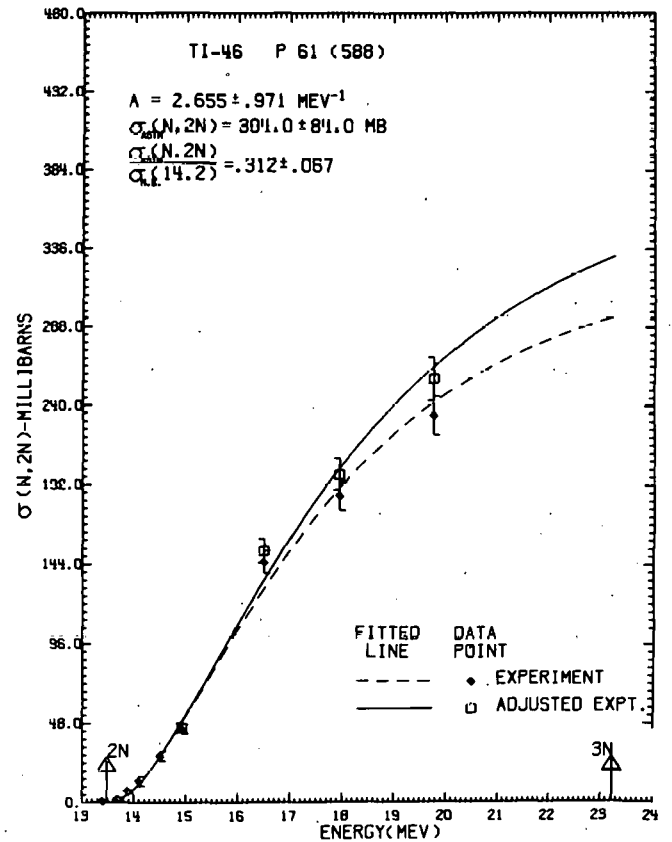
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1262.79 MB
 (N,2N) THRESHOLD = 13.48 MEV
 (N,3N) THRESHOLD = 23.22 MEV

THIS ISOTOPE HAS 24 NEUTRONS, 22 PROTONS, (MASS = 46)

NEUTRON EXCESS PARAMETER = .04348

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .3120 PLUS-OR-MINUS .0665

N/SPACING = 9.040 A/SPACING = 17.326
 ERROR 3.306 ERROR 6.336



CR-50 FROM REF. B 66 (1814)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.900	28.70 2.50	29.116	2.536
15.800	47.00 3.80	48.485	3.920
16.600	59.40 4.30	62.104	4.496
17.400	68.00 5.00	71.965	5.292
18.200	78.40 5.40	83.893	5.778
18.900	84.40 6.70	91.116	7.233
19.600	96.20 6.30	104.705	6.857

FITTED PARAMETERS

NUCLEAR TEMP. = 1.778 PLUS-OR-MINUS .111 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 111.46 PLUS-OR-MINUS 5.06 MB

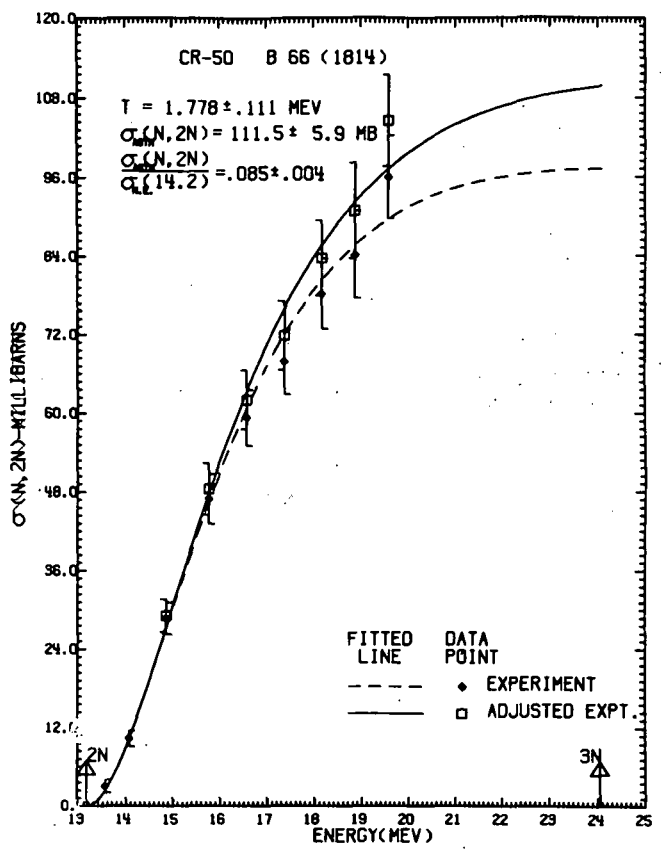
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1311.87 MB
 (N,2N) THRESHOLD = 13.20 MEV
 (N,3N) THRESHOLD = 24.05 MEV

THIS ISOTOPE HAS 26 NEUTRONS, 24 PROTONS, (MASS = 50)
 NEUTRON EXCESS PARAMETER = .04000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0850 PLUS-OR-MINUS .0045

T*SQRT(N) = 9.066 T*SQRT(A) = 12.572
 ERROR .566 ERROR .785



CR-50 FROM REF. B 66 (1814)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.900	28.70 2.50	29.116	2.536
15.800	47.00 3.80	48.485	3.920
16.600	59.40 4.30	62.104	4.496
17.400	68.00 5.00	71.965	5.292
18.200	78.40 5.40	83.893	5.778
18.900	84.40 6.70	91.116	7.233
19.600	96.20 6.30	104.705	6.857

FITTED PARAMETERS

LEVEL SPACING = 4.129 PLUS-OR-MINUS .493 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 124.55 PLUS-OR-MINUS 7.02 MB

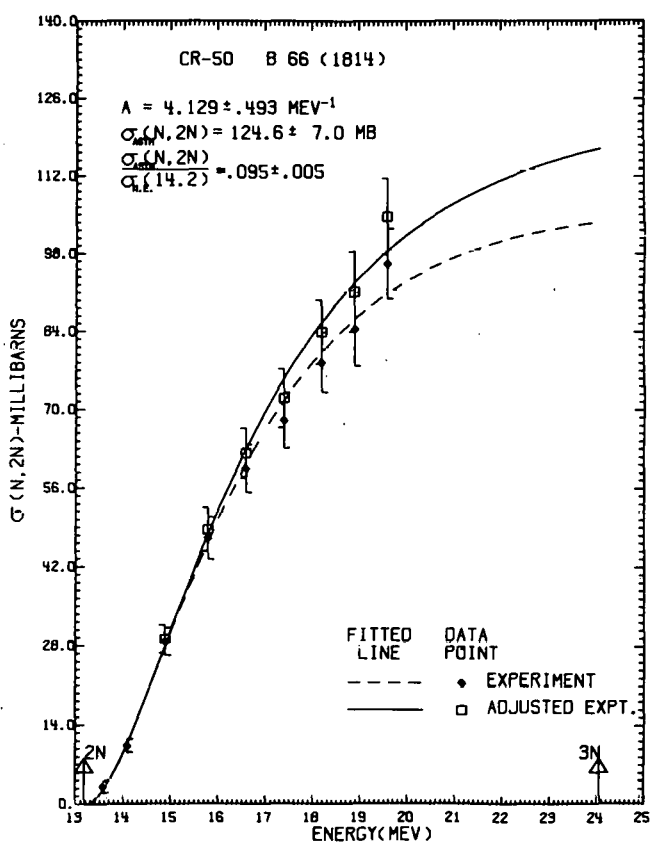
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1311.87 MB
 (N,2N) THRESHOLD = 13.20 MEV
 (N,3N) THRESHOLD = 24.05 MEV

THIS ISOTOPE HAS 26 NEUTRONS, 24 PROTONS, (MASS = 50)
 NEUTRON EXCESS PARAMETER = .04000

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0949 PLUS-OR-MINUS .0053

N/SPACING = 6.297 A/SPACING = 12.109
 ERROR .752 ERROR 1.446

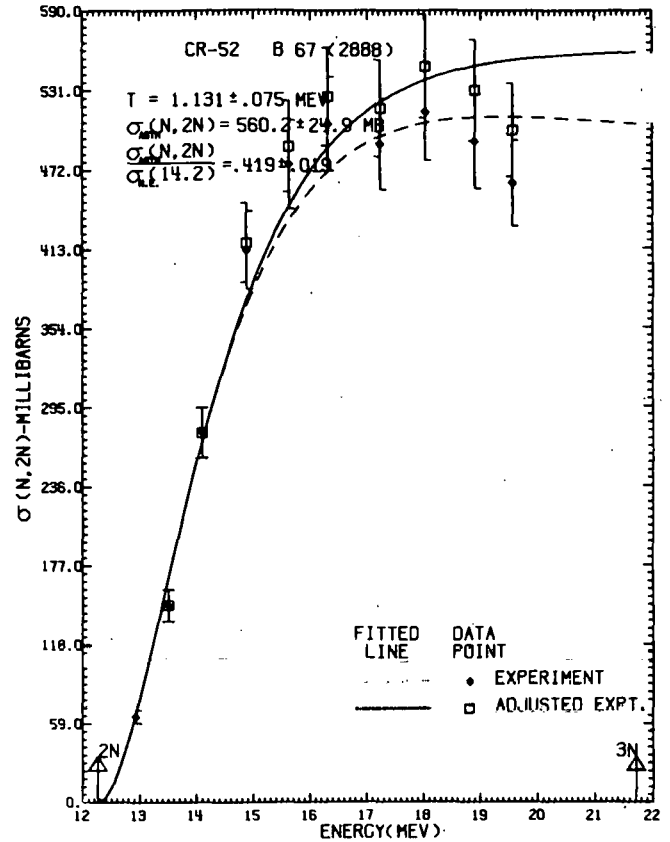


CR-52 FROM REF, B 67 (2888)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.510	147.00	12.00	147.000	12.000
14.100	276.00	19.00	276.000	19.000
14.880	412.00	29.00	417.660	29.398
15.620	476.00	33.00	489.132	33.910
16.310	506.00	35.00	526.011	36.384
17.230	491.00	34.00	517.602	35.842
18.020	515.00	36.00	548.807	38.363
18.890	493.00	35.00	531.057	37.702
19.560	462.00	32.00	501.446	34.732

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.131 PLUS-MINUS .075 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 560.19 PLUS-MINUS 24.88 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1335.54 MB
 (N,2N) THRESHOLD = 12.27 MEV
 (N,3N) THRESHOLD = 21.71 MEV
 THIS ISOTOPE HAS 28 NEUTRONS, 24 PROTONS, (MASS = 52)
 NEUTRON EXCESS PARAMETER = .07692
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4194 PLUS-MINUS .0186
 T-EQHTIN = 5.90E T-CONT(A) = 9.156
 ERROR .397 ERROR .541

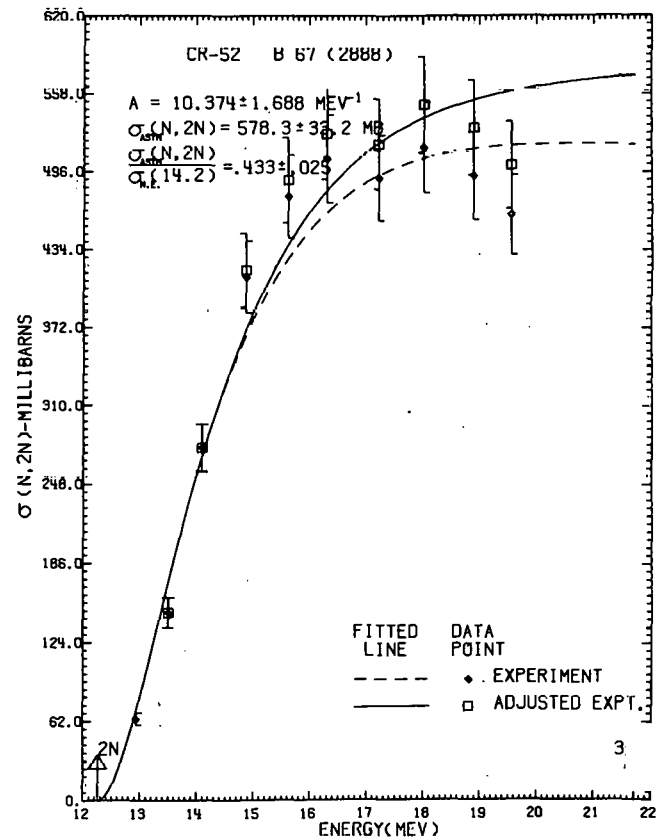


CR-52 FROM REF, B 67 (2888)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.510	147.00	12.00	147.000	12.000
14.100	276.00	19.00	276.000	19.000
14.880	412.00	29.00	417.660	29.398
15.620	476.00	33.00	489.132	33.910
16.310	506.00	35.00	526.011	36.384
17.230	491.00	34.00	517.602	35.842
18.020	515.00	36.00	548.807	38.363
18.890	493.00	35.00	531.057	37.702
19.560	462.00	32.00	501.446	34.732

FITTED PARAMETERS
 LEVEL SPACING = 10.374 PLUS-MINUS 1.688 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 578.34 PLUS-MINUS 33.18 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1335.54 MB
 (N,2N) THRESHOLD = 12.27 MEV
 (N,3N) THRESHOLD = 21.71 MEV
 THIS ISOTOPE HAS 28 NEUTRONS, 24 PROTONS, (MASS = 52)
 NEUTRON EXCESS PARAMETER = .07692
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4330 PLUS-MINUS .0248
 N/SPACING = 2.699 A/SPACING = 5.013
 ERROR .439 ERROR .816



MN-55 ...FROM REF. B69

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.200	600.00 60.00	600.000 60.000	60.000
14.100	800.00 80.00	800.000 80.000	80.000
15.000	835.00 85.00	847.920 86.315	86.315
15.450	845.00 85.00	864.937 87.006	87.006
16.150	800.00 80.00	828.362 82.836	82.836
16.500	815.00 80.00	848.455 83.284	83.284
17.050	840.00 85.00	923.488 89.201	89.201
18.000	870.00 85.00	924.577 90.332	90.332

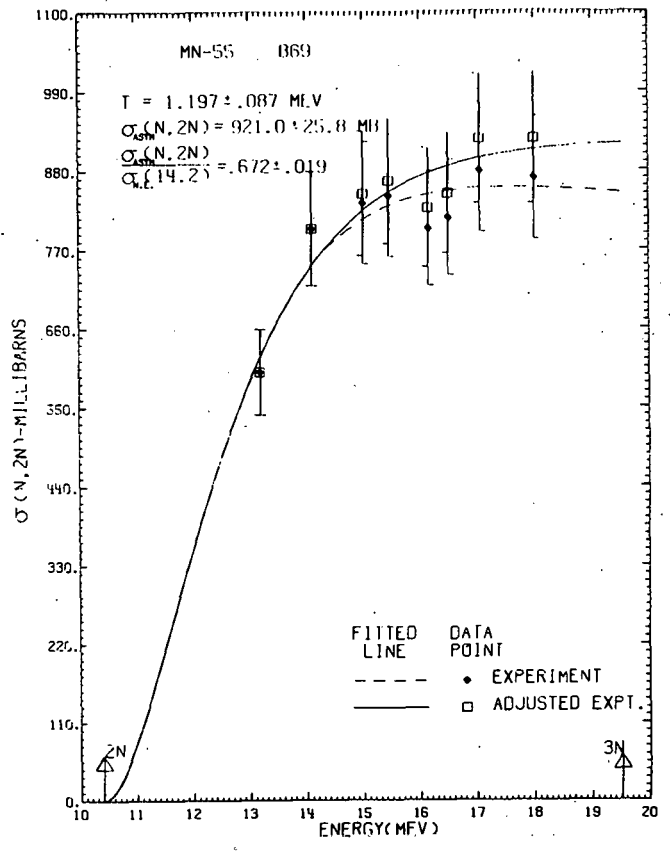
FITTED PARAMETERS

NUCLEAR TEMP. = 1.197 PLUS-OR-MINUS .087 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 920.96 PLUS-OR-MINUS 25.79 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1370.05 MB
 (N,2N) THRESHOLD = 10.41 MEV
 (N,3N) THRESHOLD = 19.52 MEV

THIS ISOTOPE HAS 30 NEUTRONS, 25 PROTONS, (MASS = 55)
 NEUTRON EXCESS PARAMETER = .09091
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6722 PLUS-OR-MINUS .0188
 T*SQRT(N) = 6.556 T*SQRT(A) = 8.877
 ERROR .477 ERROR .645



MN-55 ...FROM REF. B69

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.200	600.00 60.00	600.000 60.000	60.000
14.100	800.00 80.00	800.000 80.000	80.000
15.000	835.00 85.00	847.920 86.315	86.315
15.450	845.00 85.00	864.937 87.006	87.006
16.150	800.00 80.00	828.362 82.836	82.836
16.500	815.00 80.00	848.455 83.284	83.284
17.050	880.00 85.00	923.488 89.201	89.201
18.000	870.00 85.00	924.577 90.332	90.332

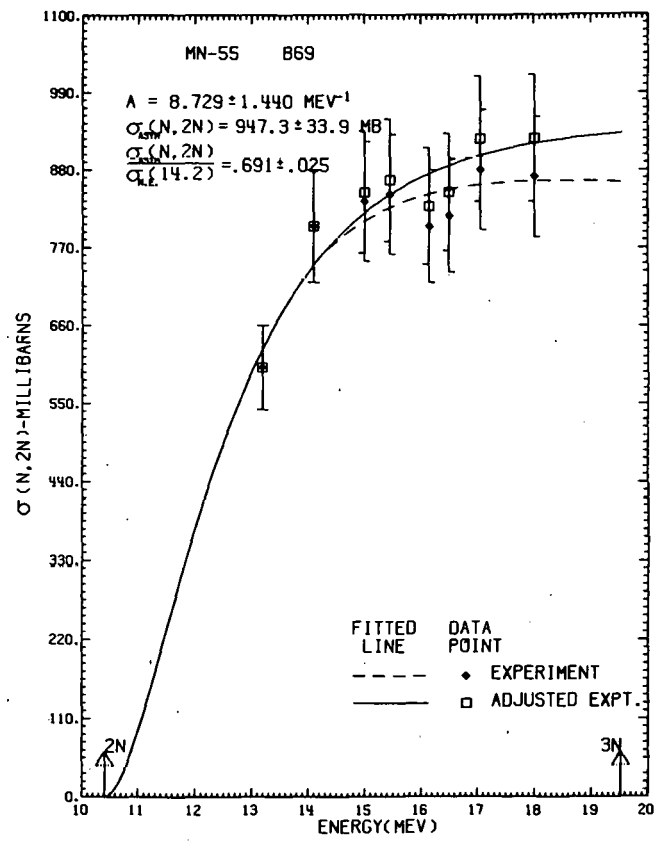
FITTED PARAMETERS

LEVEL SPACING = 8.729 PLUS-OR-MINUS 1.440 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 947.29 PLUS-OR-MINUS 33.86 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1370.05 MB
 (N,2N) THRESHOLD = 10.41 MEV
 (N,3N) THRESHOLD = 19.52 MEV

THIS ISOTOPE HAS 30 NEUTRONS, 25 PROTONS, (MASS = 55)
 NEUTRON EXCESS PARAMETER = .09091
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6914 PLUS-OR-MINUS .0247
 N/SPACING = 3.437 A/SPACING = 6.301
 ERROR .567 ERROR 1.039



MN-55 ... FROM REF. M 67 (1686)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR	MEASURED, ERR	ADJUSTED, ERR
12.700	546.00 51.00	546.000 51.000	546.000 51.000	546.000 51.000
12.940	583.00 54.00	583.000 54.000	583.000 54.000	583.000 54.000
13.280	658.00 61.00	658.000 61.000	658.000 61.000	658.000 61.000
13.500	613.00 72.00	613.000 72.000	613.000 72.000	613.000 72.000
14.960	854.00 79.00	866.581 80.164	866.581 80.164	866.581 80.164
15.820	890.00 82.00	916.679 84.458	916.679 84.458	916.679 84.458
16.520	906.00 84.00	943.474 87.474	943.474 87.474	943.474 87.474
17.350	910.00 85.00	956.934 89.571	956.934 89.571	956.934 89.571
18.440	887.00 82.00	947.708 87.612	947.708 87.612	947.708 87.612
19.390	822.00 76.00	887.645 82.069	887.645 82.069	887.645 82.069

FITTED PARAMETERS

NUCLEAR TEMP. = 1.224 PLUS-OR-MINUS .053 MEV
ASYMPTOTIC (N,2N) CROSS SECTION = 953.25 PLUS-OR-MINUS 22.54 MB

RELATED DATA

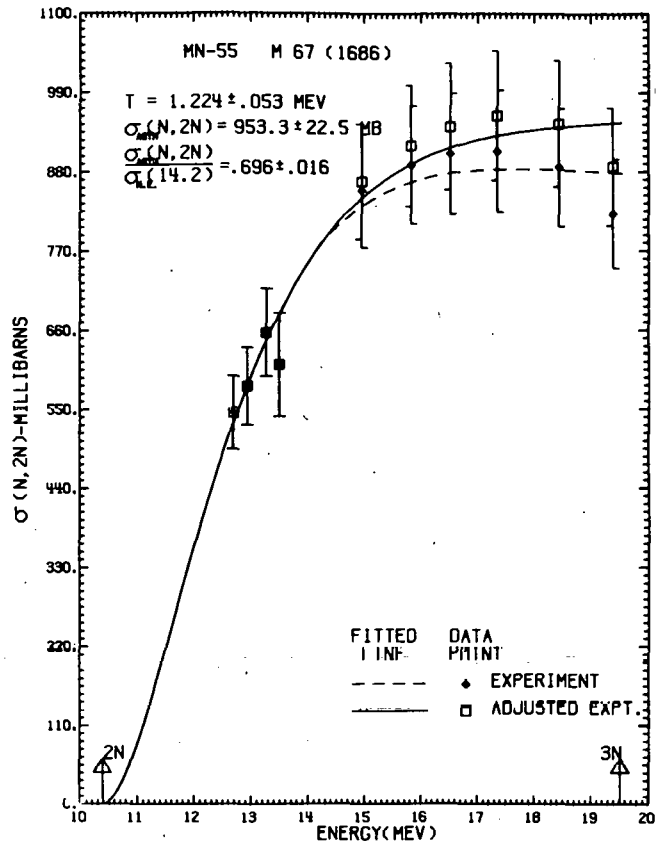
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1370.05 MB
(N,2N) THRESHOLD = 10.41 MEV
(N,3N) THRESHOLD = 19.52 MEV

THIS ISOTOPE HAS 30 NEUTRONS, 25 PROTONS, (MASS = 55)

NEUTRON EXCESS PARAMETER = .09091

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
.6958 PLUS-OR-MINUS .0165

$1/\sqrt{A(N)} = 6.704$ $1/\sqrt{A(N)} = 9.077$
ERROR .290 ERROR .393



MN-55 ... FROM REF. M 67 (1686)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR	MEASURED, ERR	ADJUSTED, ERR
12.700	546.00 51.00	546.000 51.000	546.000 51.000	546.000 51.000
12.940	583.00 54.00	583.000 54.000	583.000 54.000	583.000 54.000
13.280	658.00 61.00	658.000 61.000	658.000 61.000	658.000 61.000
13.500	613.00 72.00	613.000 72.000	613.000 72.000	613.000 72.000
14.960	854.00 79.00	866.581 80.164	866.581 80.164	866.581 80.164
15.820	890.00 82.00	916.679 84.458	916.679 84.458	916.679 84.458
16.520	906.00 84.00	943.474 87.474	943.474 87.474	943.474 87.474
17.350	910.00 85.00	956.934 89.571	956.934 89.571	956.934 89.571
18.440	887.00 82.00	947.708 87.612	947.708 87.612	947.708 87.612
19.390	822.00 76.00	887.645 82.069	887.645 82.069	887.645 82.069

FITTED PARAMETERS

LEVEL SPACING = 8.283 PLUS-OR-MINUS .823 PER MEV
ASYMPTOTIC (N,2N) CROSS SECTION = 977.24 PLUS-OR-MINUS 28.16 MB

RELATED DATA

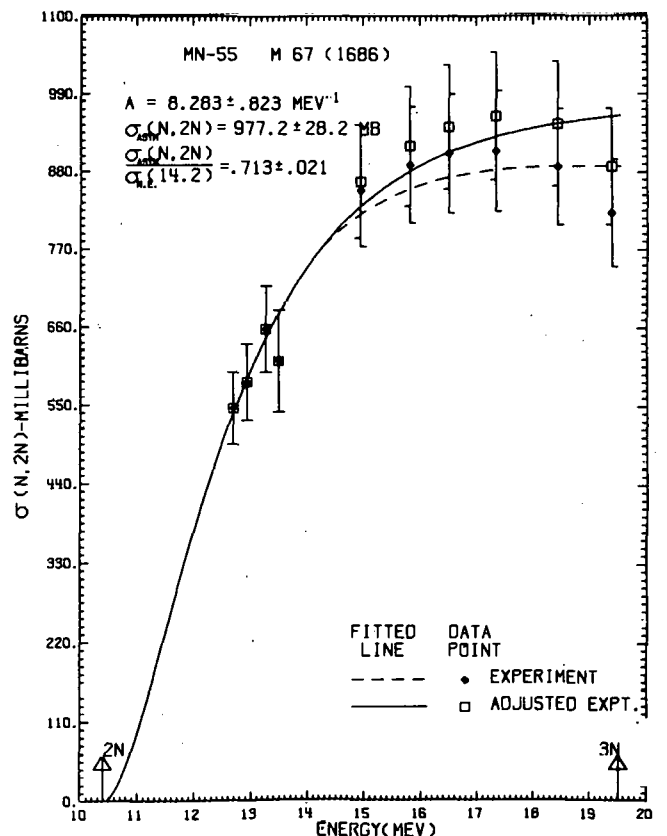
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1370.05 MB
(N,2N) THRESHOLD = 10.41 MEV
(N,3N) THRESHOLD = 19.52 MEV

THIS ISOTOPE HAS 30 NEUTRONS, 25 PROTONS, (MASS = 55)

NEUTRON EXCESS PARAMETER = .09091

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
.7133 PLUS-OR-MINUS .0206

$1/\sqrt{A(N)} = 3.622$ $1/\sqrt{A(N)} = 6.640$
ERROR .360 ERROR .660



MN-55 FROM REF. P 65 (1738)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.630	593.00	36.00	593.000	36.000	
12.810	660.00	40.00	660.000	40.000	
12.980	712.00	43.00	712.000	43.000	
13.240	793.00	48.00	793.000	48.000	
13.460	776.00	47.00	776.000	47.000	
13.790	828.00	50.00	828.000	50.000	
14.050	937.00	56.00	937.000	56.000	
14.420	946.00	57.00	950.156	57.250	
14.710	945.00	57.00	954.471	57.571	
15.090	996.00	60.00	1013.061	61.028	
15.370	1005.00	60.00	1027.291	61.331	
15.720	1051.00	63.00	1080.719	64.781	
15.990	1056.00	63.00	1090.661	65.068	
16.250	1030.00	62.00	1068.186	64.299	
16.420	1060.00	64.00	1102.176	66.546	
16.610	1039.00	62.00	1083.431	64.651	
17.270	1041.00	62.00	1095.784	65.263	
17.750	1096.00	66.00	1163.180	69.918	
18.330	1125.00	68.00	1200.420	72.559	
18.710	1092.00	66.00	1170.417	70.739	
19.130	1153.00	69.00	1241.613	74.303	
19.360	1122.00	67.00	1211.219	72.328	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.303 PLUS-OR-MINUS .028 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1177.09 PLUS-OR-MINUS 13.58 MB

RELATED DATA

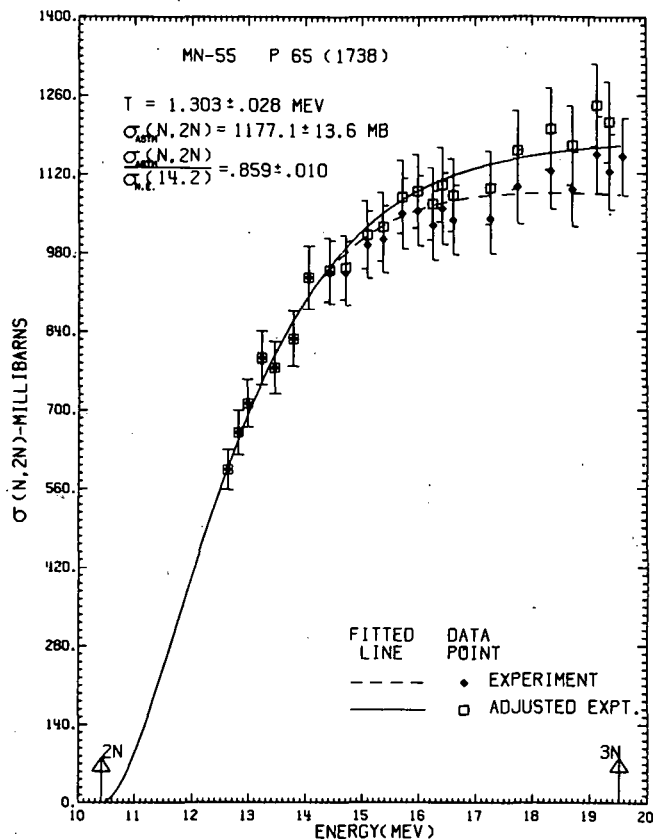
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1370.05 MB
 (N,2N) THRESHOLD = 10.41 MEV
 (N,3N) THRESHOLD = 19.52 MEV

THIS ISOTOPE HAS 30 NEUTRONS, 25 PROTONS, (MASS = 55)

NEUTRON EXCESS PARAMETER = .09091

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8592 PLUS-OR-MINUS .0099

T*SORT(N) = 7.137 T*SORT(A) = 9.663
 ERROR .153 ERROR .208



MN-55 FROM REF. P 65 (1738)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.630	593.00	36.00	593.000	36.000	
12.810	660.00	40.00	660.000	40.000	
12.980	712.00	43.00	712.000	43.000	
13.240	793.00	48.00	793.000	48.000	
13.460	776.00	47.00	776.000	47.000	
13.790	828.00	50.00	828.000	50.000	
14.050	937.00	56.00	937.000	56.000	
14.420	946.00	57.00	950.156	57.250	
14.710	945.00	57.00	954.471	57.571	
15.090	996.00	60.00	1013.061	61.028	
15.370	1005.00	60.00	1027.291	61.331	
15.720	1051.00	63.00	1080.719	64.781	
15.990	1056.00	63.00	1090.661	65.068	
16.250	1030.00	62.00	1068.186	64.299	
16.420	1060.00	64.00	1102.176	66.546	
16.610	1039.00	62.00	1083.431	64.651	
17.270	1041.00	62.00	1095.784	65.263	
17.750	1096.00	66.00	1163.180	69.918	
18.330	1125.00	68.00	1200.420	72.559	
18.710	1092.00	66.00	1170.417	70.739	
19.130	1153.00	69.00	1241.613	74.303	
19.360	1122.00	67.00	1211.219	72.328	

FITTED PARAMETERS

LEVEL SPACING = 7.162 PLUS-OR-MINUS .295 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1221.76 PLUS-OR-MINUS 14.58 MB

RELATED DATA

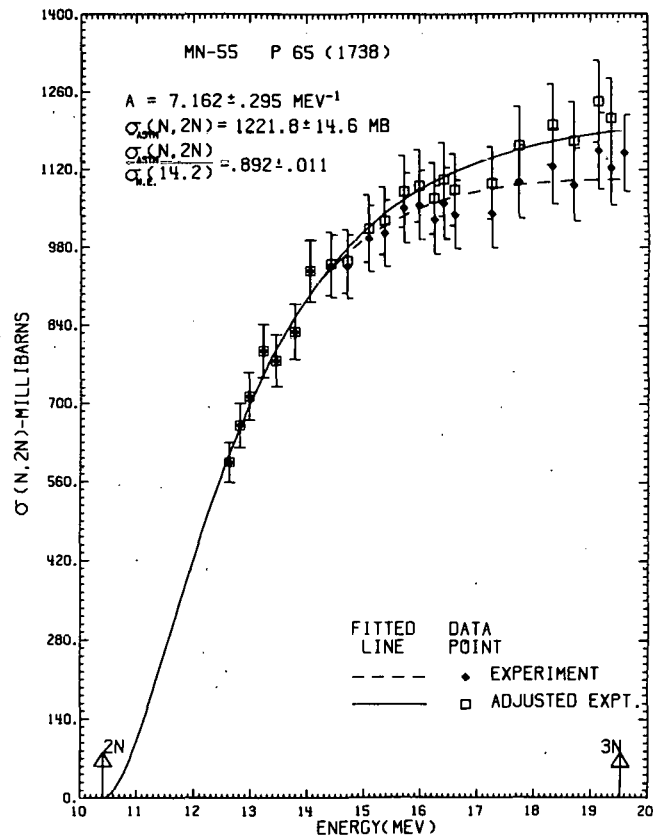
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1370.05 MB
 (N,2N) THRESHOLD = 10.41 MEV
 (N,3N) THRESHOLD = 19.52 MEV

THIS ISOTOPE HAS 30 NEUTRONS, 25 PROTONS, (MASS = 55)

NEUTRON EXCESS PARAMETER = .09091

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8918 PLUS-OR-MINUS .0106

N/SPACING = 4.189 A/SPACING = 7.679
 ERROR .173 ERROR .316



FE-54 ... FROM REF. B 72

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ERR	ADJUSTED	ERR
15.080	23.00	1.50	24.005	1.526	
15.350	29.00	1.70	29.641	1.738	
15.610	29.50	2.00	30.208	2.053	
15.920	37.00	2.10	36.186	2.167	
16.430	45.50	2.40	47.341	2.497	
16.940	56.00	3.00	58.711	3.145	
17.560	58.20	3.10	59.432	3.278	
18.230	58.10	3.00	61.973	3.200	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.268 PLUS-OR-MINUS .089 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 72.67 PLUS-OR-MINUS 4.57 MB

RELATED DATA

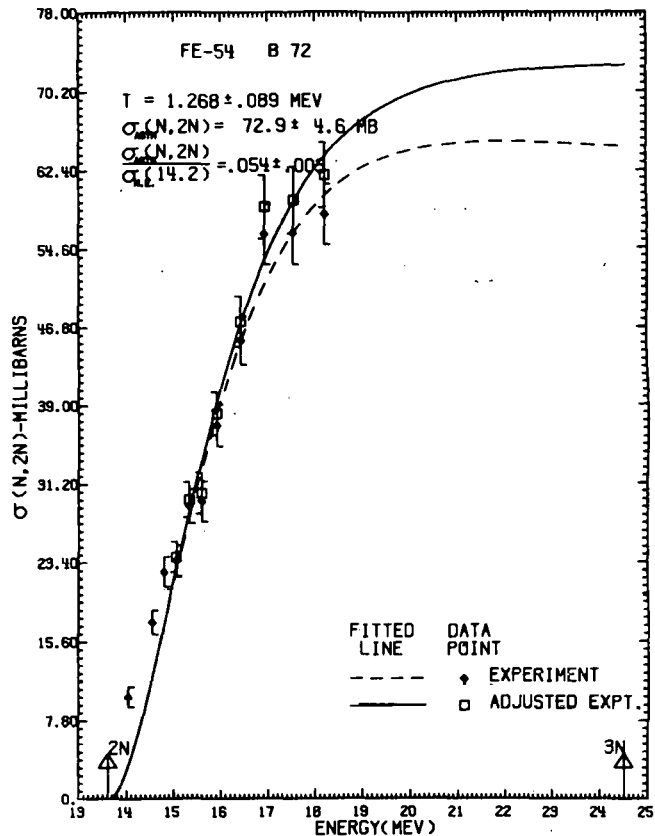
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1358.67 MB
 (N,2N) THRESHOLD = 13.63 MEV
 (N,3N) THRESHOLD = 24.51 MEV

THIS ISOTOPE HAS 28 NEUTRONS, 26 PROTONS, (MASS = 54)

NEUTRON EXCESS PARAMETER = .03704

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0536 PLUS-OR-MINUS .0034

T*SQRT(N) = 6.710 T*SQRT(A) = 9.318
 ERROR .471 ERROR .054



FE-54 ... FROM REF. B 72

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ERR	ADJUSTED	ERR
15.080	23.00	1.50	24.005	1.526	
15.350	29.00	1.70	29.641	1.738	
15.610	29.50	2.00	30.208	2.053	
15.920	37.00	2.10	36.186	2.167	
16.430	45.50	2.40	47.341	2.497	
16.940	56.00	3.00	58.711	3.145	
17.560	58.20	3.10	59.432	3.278	
18.230	58.10	3.00	61.973	3.200	

FITTED PARAMETERS

LEVEL SPACING = 8.539 PLUS-OR-MINUS 1.342 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 78.24 PLUS-OR-MINUS 5.88 MB

RELATED DATA

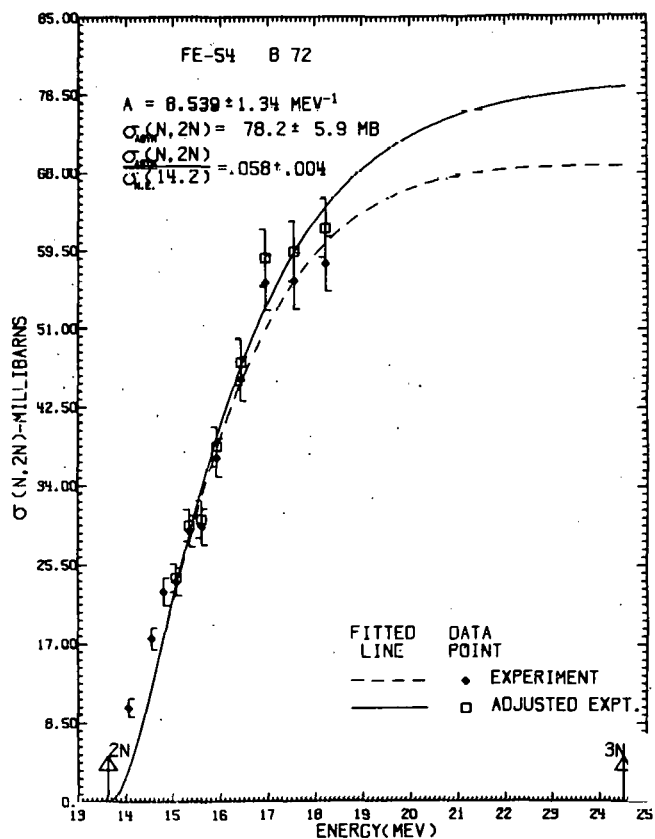
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1358.67 MB
 (N,2N) THRESHOLD = 13.63 MEV
 (N,3N) THRESHOLD = 24.51 MEV

THIS ISOTOPE HAS 28 NEUTRONS, 26 PROTONS, (MASS = 54)

NEUTRON EXCESS PARAMETER = .03704

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0576 PLUS-OR-MINUS .0043

N/SPACING = 3.279 A/SPACING = 6.324
 ERROR .515 ERROR .994



FE-54 ..FROM REF. A 68

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR	MEASURED, ERR	ADJUSTED, ERR
15.100	36.00	15.00	36.631	15.263
15.500	57.00	10.00	58.412	10.248
15.850	55.00	10.00	56.698	10.309
16.000	58.00	8.00	59.938	8.267
16.050	73.00	7.00	75.500	7.240
16.550	92.00	9.00	95.899	9.381
16.950	95.00	10.00	99.614	10.486
17.400	128.00	13.00	135.068	13.718

FITTED PARAMETERS

NUCLEAR TEMP. = 2.588 PLUS-OR-MINUS .801 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 295.38 PLUS-OR-MINUS 122.72 MB

RELATED DATA

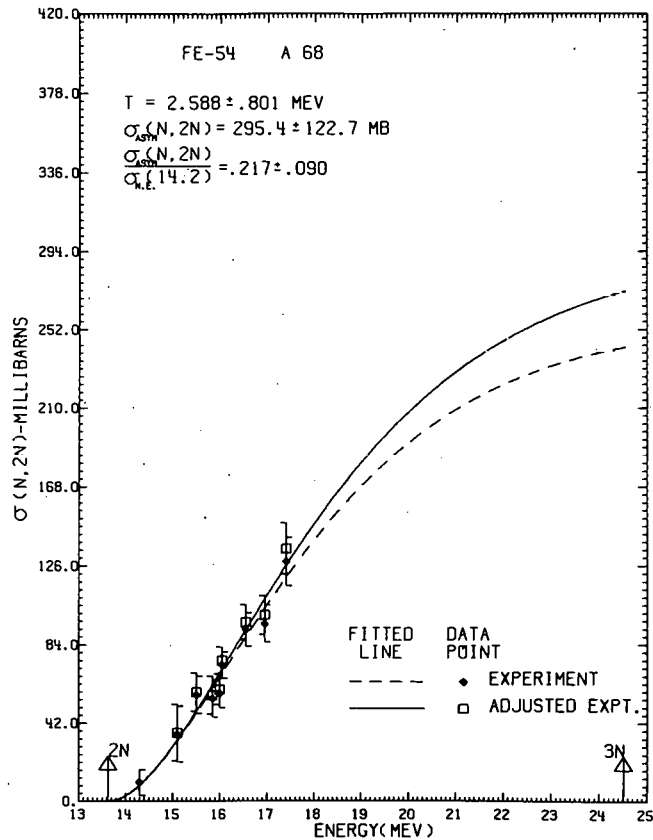
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1398.67 MB
 (N,2N) THRESHOLD = 13.63 MEV
 (N,3N) THRESHOLD = 24.51 MEV

THIS ISOTOPE HAS 26 NEUTRONS, 26 PROTONS, (MASS = 54)

NEUTRON EXCESS PARAMETER = .03704

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .2174 PLUS-OR-MINUS .0903

T*SQRT(N) = 13.694 T*SQRT(A) = 19.018
 ERROR 4.238 ERROR 5.886



FE-54 ..FROM REF. A 68

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR	MEASURED, ERR	ADJUSTED, ERR
15.100	36.00	15.00	36.631	15.263
15.500	57.00	10.00	58.412	10.248
15.850	55.00	10.00	56.698	10.309
16.000	58.00	8.00	59.938	8.267
16.050	73.00	7.00	75.500	7.240
16.550	92.00	9.00	95.899	9.381
16.950	95.00	10.00	99.614	10.486
17.400	128.00	13.00	135.068	13.718

FITTED PARAMETERS

LEVEL SPACING = 1.548 PLUS-OR-MINUS 1.242 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 408.10 PLUS-OR-MINUS 239.90 MB

RELATED DATA

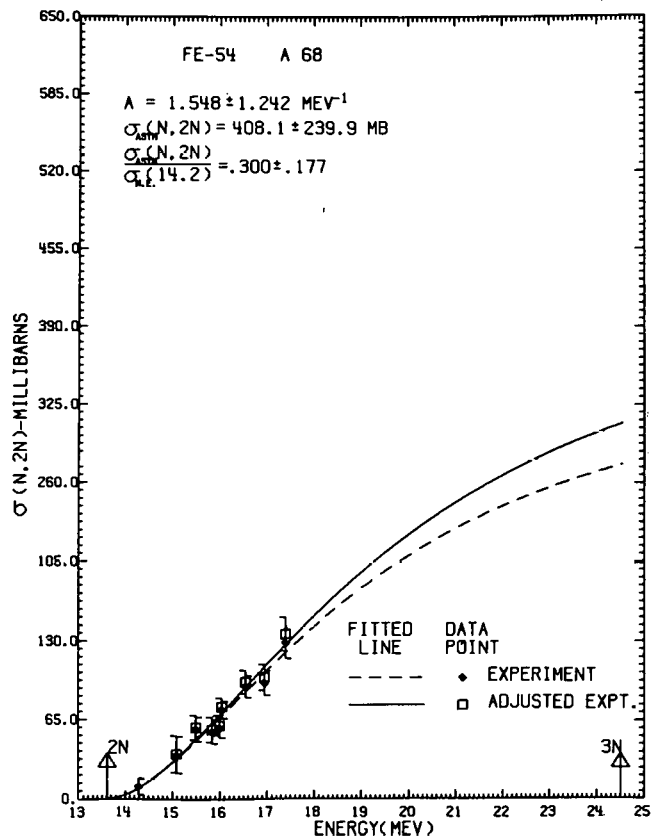
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1358.67 MB
 (N,2N) THRESHOLD = 13.63 MEV
 (N,3N) THRESHOLD = 24.51 MEV

THIS ISOTOPE HAS 28 NEUTRONS, 26 PROTONS, (MASS = 54)

NEUTRON EXCESS PARAMETER = .03704

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .3004 PLUS-OR-MINUS .1766

N/SPACING = 18.088 A/SPACING = 34.884
 ERROR 14.512 ERROR 27.988



FE-54 FROM REF, T58 (326)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ERR	ADJUSTED	ERR
16.890	120.00	36.00		125.719	37.716
17.890	170.00	51.00		160.556	54.167

FITTED PARAMETERS

NUCLEAR TEMP. = 15.88 PLUS-MINUS .000 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1035.38 PLUS-MINUS .00 MB

RELATED DATA

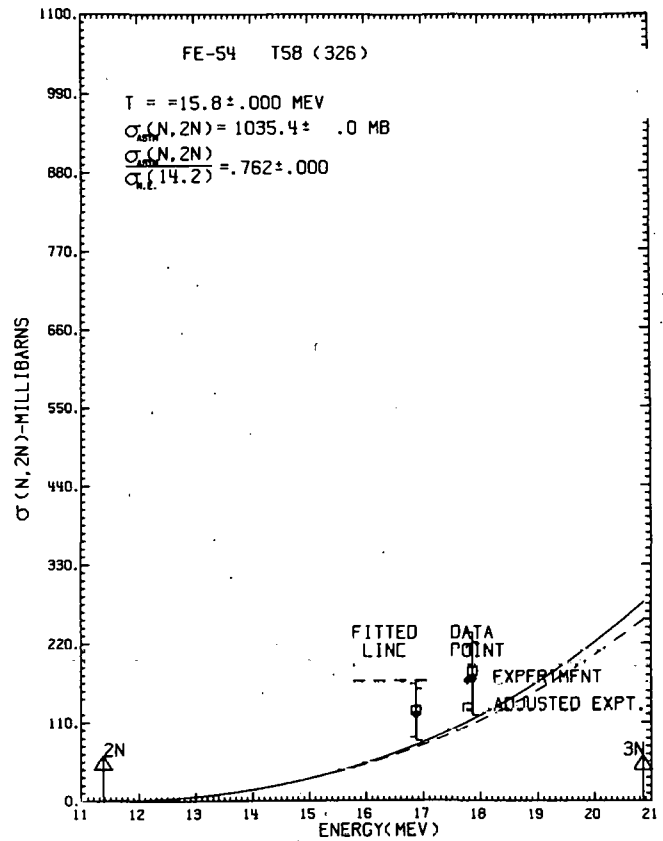
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1358.67 MB
 (N,2N) THRESHOLD = 11.40 MEV
 (N,3N) THRESHOLD = 20.86 MEV

THIS ISOTOPE HAS 28 NEUTRONS, 26 PROTONS, (MASS = 54)

NEUTRON EXCESS PARAMETER = .03704

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7621 PLUS-MINUS .0000

T*SQRT(N) = -84.034 T*SQRT(A) = -116.701
 ERROR .000 ERROR .000



NO "A" FIT POSSIBLE

CO-59 ... FROM REF. D 68 (2340)

RGY (MEV)	N,2N CROSS SECTION (MB)		SECTION (MB)	
	MEASURED	ERR	ADJUSTED	ERR
12.570	366.90	9.60	366.900	9.600
13.330	518.10	26.00	518.100	26.000
13.970	600.50	28.00	600.500	28.000
14.120	640.10	31.30	640.100	31.300
14.900	683.30	63.70	687.187	64.062
14.800	669.60	34.20	677.009	34.583
15.040	643.50	41.00	653.441	41.633
15.250	626.60	36.00	638.558	36.687
15.400	590.10	47.70	602.863	48.732
16.220	706.60	23.30	731.185	24.111
16.570	688.00	20.10	715.553	20.905
17.050	724.10	12.90	758.078	13.505
17.630	703.50	24.10	742.013	25.419
18.200	709.90	24.40	753.873	25.911

FITTED PARAMETERS

NUCLEAR TEMP. = 1.175 PLUS-OR-MINUS .037 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 765.30 PLUS-OR-MINUS 11.69 MB

RELATED DATA

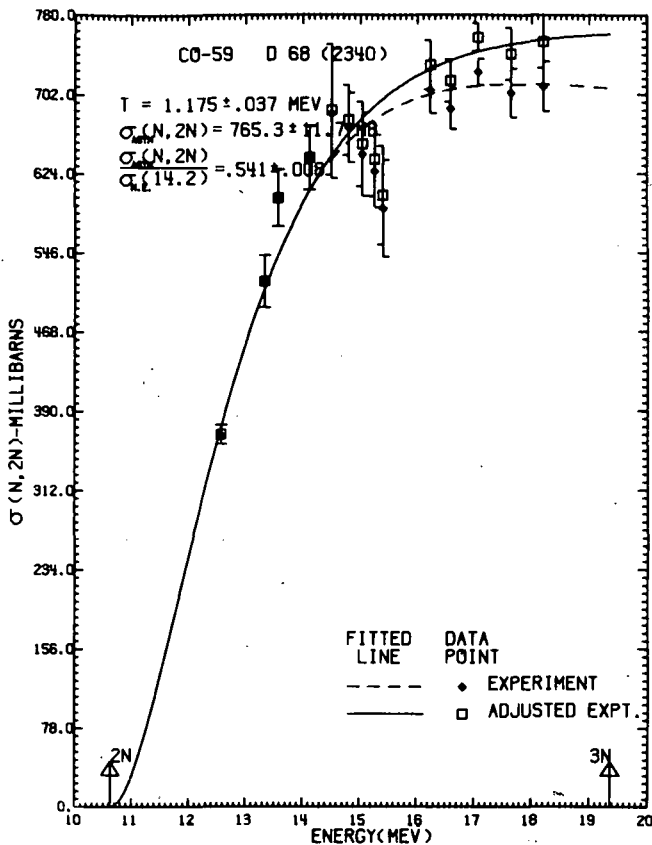
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1414.36 MB
 (N,2N) THRESHOLD = 10.64 MEV
 (N,3N) THRESHOLD = 19.36 MEV

THIS ISOTOPE HAS 32 NEUTRONS, 27 PROTONS, (MASS = 59)

NEUTRON EXCESS PARAMETER = .08475

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5411 PLUS-OR-MINUS .0063

T*SQRT(N) = 6.647 T*SQRT(A) = 9.025
 ERROR .209 ERROR .284



CO-59 ... FROM REF. D 68 (2340)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		SECTION (MB)	
	MEASURED	ERR	ADJUSTED	ERR
12.570	366.90	9.60	366.900	9.600
13.330	518.10	26.00	518.100	26.000
13.970	600.50	28.00	600.500	28.000
14.120	640.10	31.30	640.100	31.300
14.900	683.30	63.70	687.187	64.062
14.800	669.60	34.20	677.009	34.583
15.040	643.50	41.00	653.441	41.633
15.250	626.60	36.00	638.558	36.687
15.400	590.10	47.70	602.863	48.732
16.220	706.60	23.30	731.185	24.111
16.570	688.00	20.10	715.553	20.905
17.050	724.10	12.90	758.078	13.505
17.630	703.50	24.10	742.013	25.419
18.200	709.90	24.40	753.873	25.911

FITTED PARAMETERS

LEVEL SPACING = 8.697 PLUS-OR-MINUS .617 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 791.27 PLUS-OR-MINUS 19.04 MB

RELATED DATA

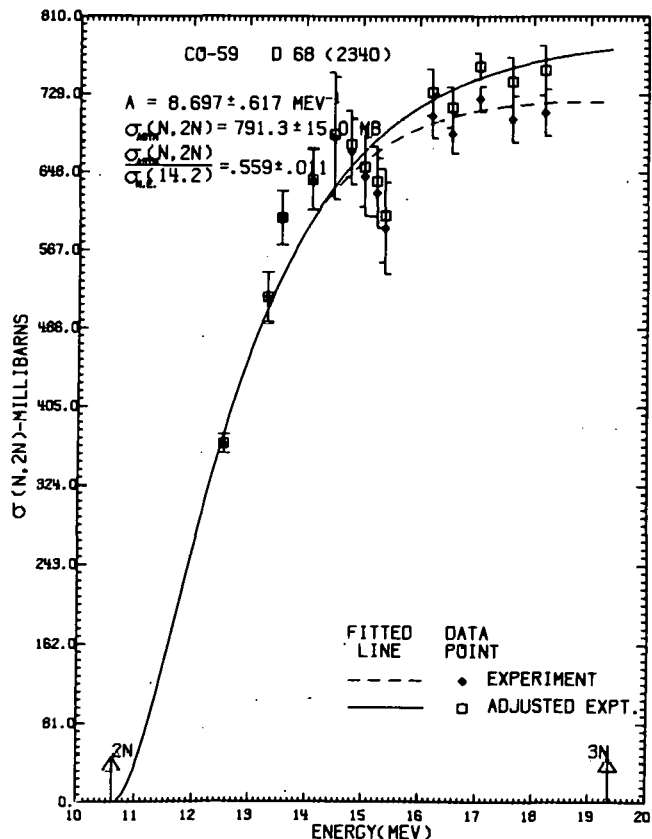
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1414.36 MB
 (N,2N) THRESHOLD = 10.64 MEV
 (N,3N) THRESHOLD = 19.36 MEV

THIS ISOTOPE HAS 32 NEUTRONS, 27 PROTONS, (MASS = 59)

NEUTRON EXCESS PARAMETER = .08475

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5594 PLUS-OR-MINUS .0106

PACING = 3.679 A/SPACING = 6.784
 ERROR .261 ERROR .461



CO-59 ... FROM REF. 0 67 (1871)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR	MEASURED, ERR	ADJUSTED, ERR
13.390	810.00 25.00	810.000 25.000	810.000 25.000	810.000 25.000
13.640	914.00 27.00	914.000 27.000	914.000 27.000	914.000 27.000
13.940	920.00 28.00	920.000 28.000	920.000 28.000	920.000 28.000
14.270	1010.00 7.00	1011.358 7.009	1011.358 7.009	1011.358 7.009
14.440	996.00 18.00	1000.548 18.082	1000.548 18.082	1000.548 18.082
14.730	1030.00 17.00	1040.217 17.169	1040.217 17.169	1040.217 17.169
14.960	1105.00 30.00	1120.514 30.421	1120.514 30.421	1120.514 30.421

FITTED PARAMETERS

NUCLEAR TEMP. = 1.183 PLUS-OR-MINUS .122 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1237.35 PLUS-OR-MINUS 68.91 MB

RELATED DATA

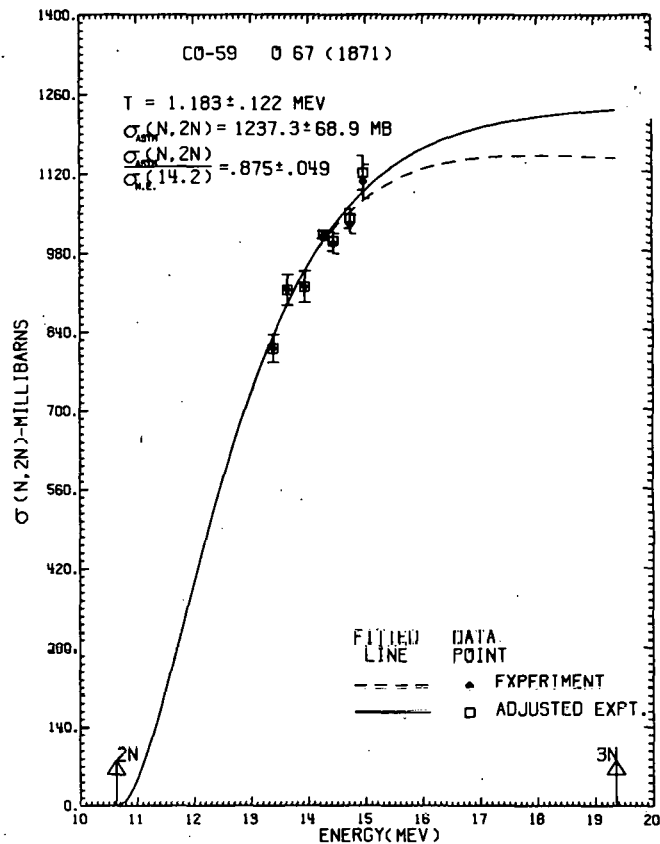
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1414.38 MB
 (N,2N) THRESHOLD = 10.64 MEV
 (N,3N) THRESHOLD = 19.36 MEV

THIS ISOTOPE HAS 32 NEUTRONS, 27 PROTONS, (MASS = 59)

NEUTRON EXCESS PARAMETER = .08475

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8748 PLUS-OR-MINUS .0467

T*SQRT(N) = 6.692 T*SQRT(A) = 9.087
 ERROR .890 ERROR .937



CO-59 ... FROM REF. 0 67 (1871)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR	MEASURED, ERR	ADJUSTED, ERR
13.390	810.00 25.00	810.000 25.000	810.000 25.000	810.000 25.000
13.640	914.00 27.00	914.000 27.000	914.000 27.000	914.000 27.000
13.940	920.00 28.00	920.000 28.000	920.000 28.000	920.000 28.000
14.270	1010.00 7.00	1011.358 7.009	1011.358 7.009	1011.358 7.009
14.440	996.00 18.00	1000.548 18.082	1000.548 18.082	1000.548 18.082
14.730	1030.00 17.00	1040.217 17.169	1040.217 17.169	1040.217 17.169
14.960	1105.00 30.00	1120.514 30.421	1120.514 30.421	1120.514 30.421

FITTED PARAMETERS

LEVEL SPACING = 8.385 PLUS-OR-MINUS 1.978 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1308.92 PLUS-OR-MINUS 96.42 MB

RELATED DATA

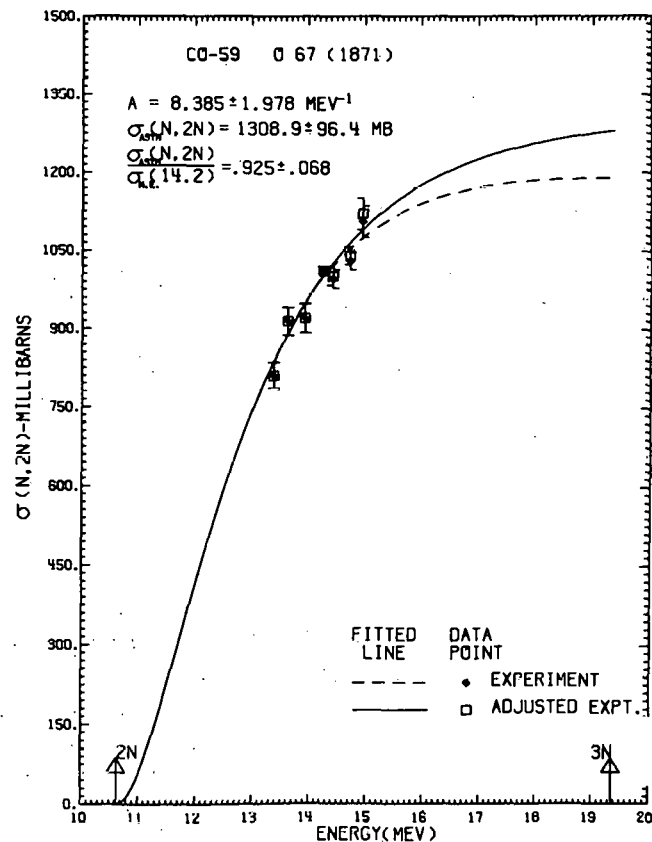
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1414.38 MB
 (N,2N) THRESHOLD = 10.64 MEV
 (N,3N) THRESHOLD = 19.36 MEV

THIS ISOTOPE HAS 32 NEUTRONS, 27 PROTONS, (MASS = 59)

NEUTRON EXCESS PARAMETER = .08475

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .9254 PLUS-OR-MINUS .0682

N/SPACING = 3.016 A/SPACING = 7.036
 ERROR .900 ERROR 1.660



CO-59 ...FROM REF. B 66 (2894)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB) ADJUSTED	ERR
12,550	429.00	34.00	429.000	34.000
14,100	642.00	32.00	642.000	32.000
15,200	695.00	56.00	707.667	57.021
16,700	700.00	56.00	729.364	58.349
18,200	761.00	61.00	808.138	64.778
19,200	864.00	69.00	927.490	74.070

FITTED PARAMETERS

NUCLEAR TEMP. = 1.124 PLUS-OR-MINUS .110 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 806.69 PLUS-OR-MINUS 39.84 MB

RELATED DATA

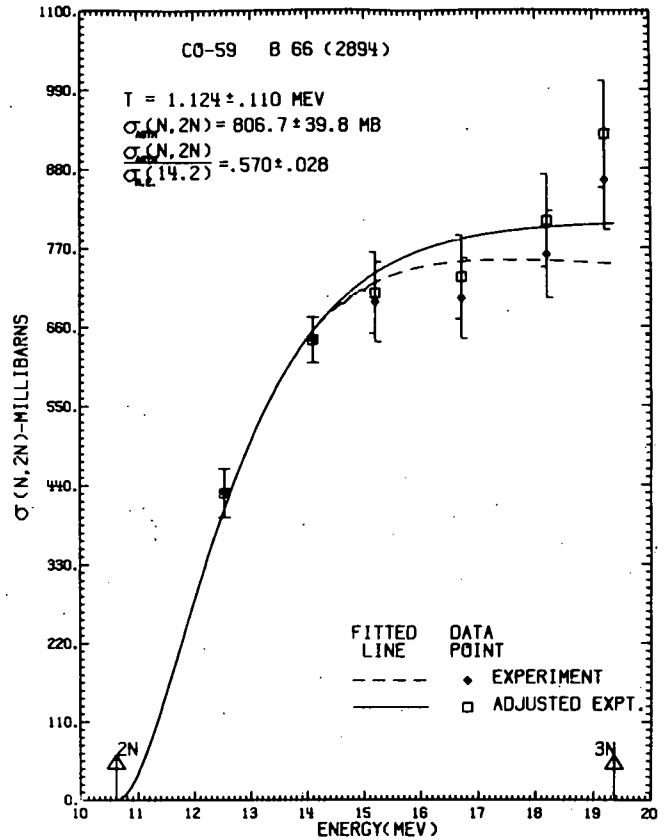
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1414.38 MB
 (N,2N) THRESHOLD = 10.64 MEV
 (N,3N) THRESHOLD = 19.36 MEV

THIS ISOTOPE HAS 32 NEUTRONS, 27 PROTONS, (MASS = 59)

NEUTRON EXCESS PARAMETER = .08475

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5703 PLUS-OR-MINUS .0282

T*SQRT(N) = 6.358 T*SQRT(A) = 8.634
 ERROR .622 ERROR .845



CO-59 ...FROM REF. B 66 (2894)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB) ADJUSTED	ERR
12,550	429.00	34.00	429.000	34.000
14,100	642.00	32.00	642.000	32.000
15,200	695.00	56.00	707.667	57.021
16,700	700.00	56.00	729.364	58.349
18,200	761.00	61.00	808.138	64.778
19,200	864.00	69.00	927.490	74.070

FITTED PARAMETERS

LEVEL SPACING = 9.609 PLUS-OR-MINUS 1.738 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 832.03 PLUS-OR-MINUS 41.12 MB

RELATED DATA

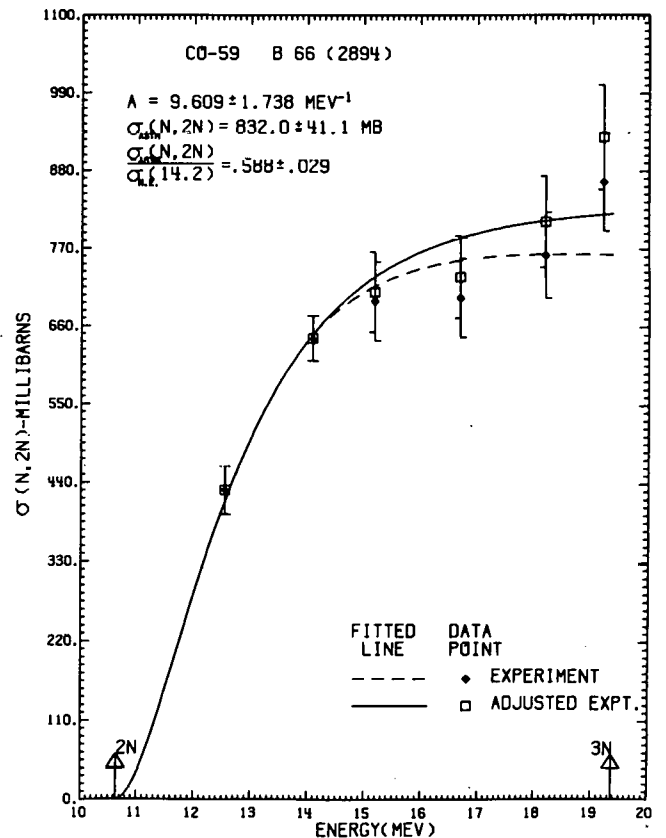
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1414.38 MB
 (N,2N) THRESHOLD = 10.64 MEV
 (N,3N) THRESHOLD = 19.36 MEV

THIS ISOTOPE HAS 32 NEUTRONS, 27 PROTONS, (MASS = 59)

NEUTRON EXCESS PARAMETER = .08475

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5883 PLUS-OR-MINUS .0291

N/SPACING = 3.330 A/SPACING = 6.140
 ERROR .602 ERROR 1.111



CO-59 ... FROM REF. P 66 (1909)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR	MEASURED, ERR	ADJUSTED, ERR
13.200	577.00 26.00	577.000 26.000	577.000 26.000	577.000 26.000
13.500	641.00 28.00	641.000 28.000	641.000 28.000	641.000 28.000
14.200	682.00 31.00	682.000 31.000	682.000 31.000	682.000 31.000
14.500	746.00 64.00	750.243 64.364	750.243 64.364	750.243 64.364
14.900	755.00 34.00	764.796 34.441	764.796 34.441	764.796 34.441
15.200	750.00 41.00	763.669 41.747	763.669 41.747	763.669 41.747
15.500	679.00 36.00	694.821 36.839	694.821 36.839	694.821 36.839
15.700	680.00 47.00	698.080 48.250	698.080 48.250	698.080 48.250

FITTED PARAMETERS

NUCLEAR TEMP. = .896 PLUS-OR-MINUS .087 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 760.29 PLUS-OR-MINUS 27.26 MB

RELATED DATA

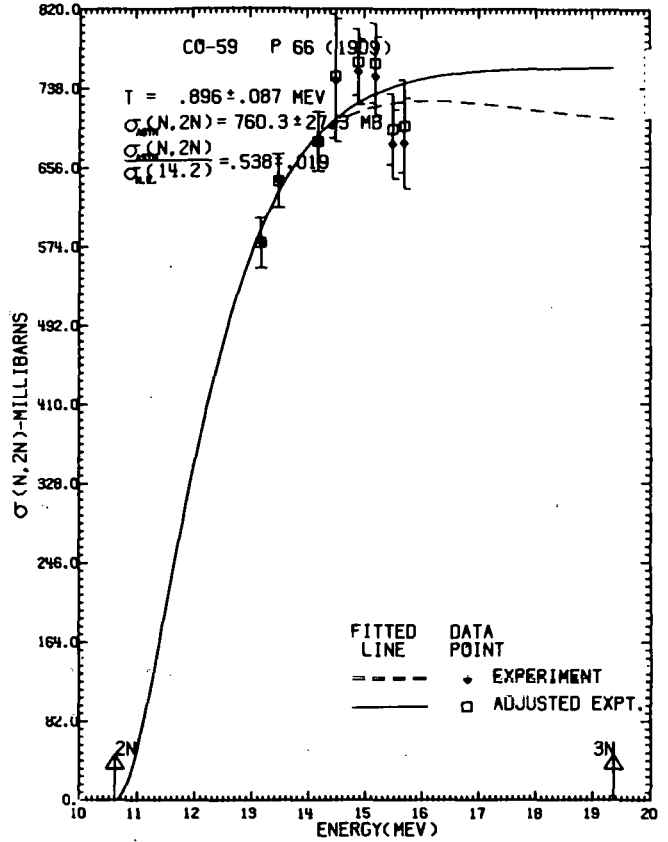
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1414.38 MB
 (N,2N) THRESHOLD = 10.64 MEV
 (N,3N) THRESHOLD = 19.36 MEV

THIS ISOTOPE HAS 32 NEUTRONS, 27 PROTONS, (MASS = 59)

NEUTRON EXCESS PARAMETER = .06475

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5375 PLUS-OR-MINUS .0193

185JRI(N) = 3.069 T=EXIT(A) = 6.882
 ERROR .492 ERROR .448



CO-59 ... FROM REF. P 66 (1909)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR	MEASURED, ERR	ADJUSTED, ERR
13.200	577.00 26.00	577.000 26.000	577.000 26.000	577.000 26.000
13.500	641.00 28.00	641.000 28.000	641.000 28.000	641.000 28.000
14.200	682.00 31.00	682.000 31.000	682.000 31.000	682.000 31.000
14.500	746.00 64.00	750.243 64.364	750.243 64.364	750.243 64.364
14.900	755.00 34.00	764.796 34.441	764.796 34.441	764.796 34.441
15.200	750.00 41.00	763.669 41.747	763.669 41.747	763.669 41.747
15.500	679.00 36.00	694.821 36.839	694.821 36.839	694.821 36.839
15.700	680.00 47.00	698.080 48.250	698.080 48.250	698.080 48.250

FITTED PARAMETERS

LEVEL SPACING = 15.641 PLUS-OR-MINUS 3.354 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 774.31 PLUS-OR-MINUS 33.64 MB

RELATED DATA

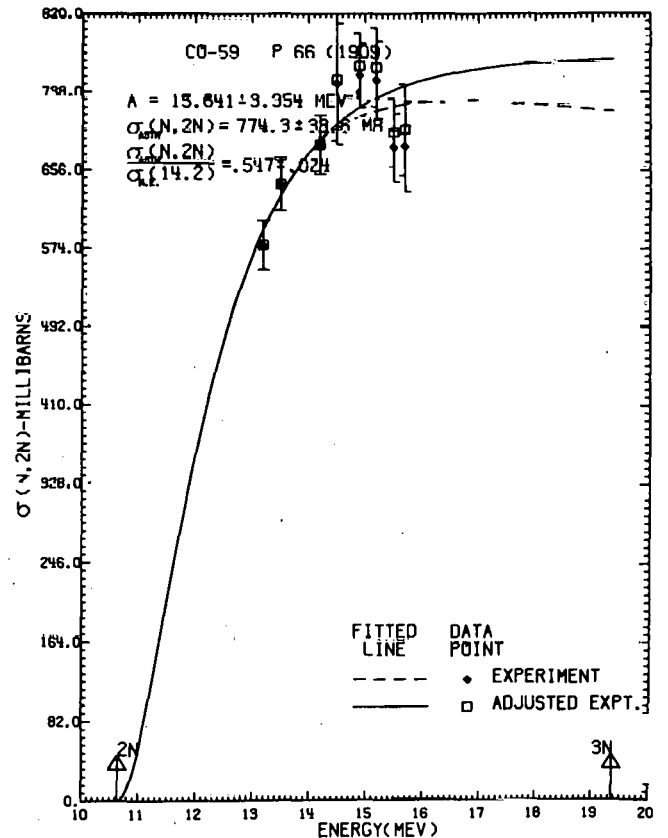
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1414.38 MB
 (N,2N) THRESHOLD = 10.64 MEV
 (N,3N) THRESHOLD = 19.36 MEV

THIS ISOTOPE HAS 32 NEUTRONS, 27 PROTONS, (MASS = 59)

NEUTRON EXCESS PARAMETER = .06475

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5475 PLUS-OR-MINUS .0238

N/SPACING = 2.046 A/SPACING = 3.772
 ERROR .439 ERROR .809

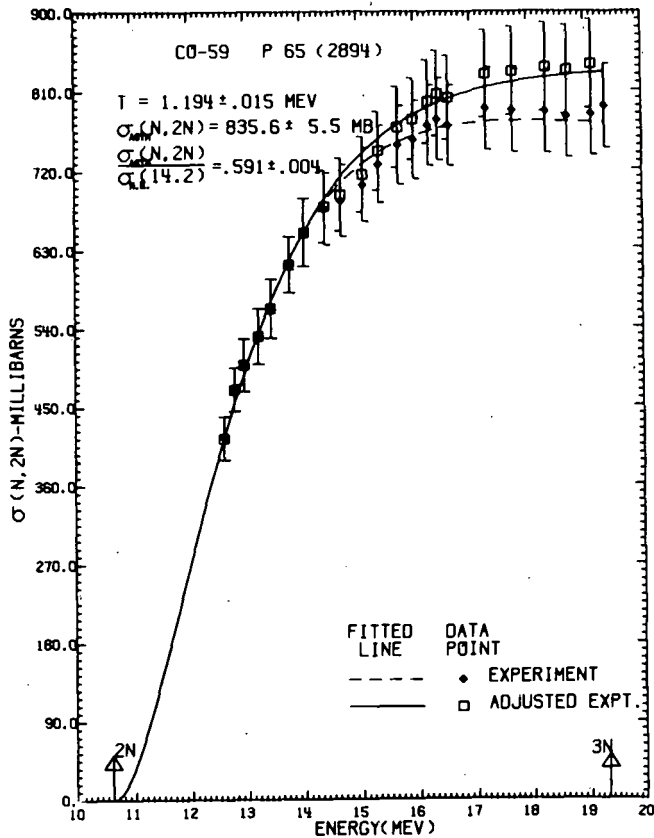


CO-59 FROM REF. P 65 (2894)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.630	414.00	25.00	414.000	25.000
12.810	470.00	25.00	470.000	25.000
12.980	498.00	30.00	498.000	30.000
13.240	531.00	32.00	531.000	32.000
13.460	563.00	34.00	563.000	34.000
13.790	613.00	32.00	613.000	32.000
14.050	650.00	39.00	650.000	39.000
14.420	677.00	41.00	679.837	41.172
14.710	686.00	41.00	692.555	41.392
15.090	704.00	42.00	715.490	42.686
15.370	727.00	44.00	742.356	44.929
15.720	749.00	45.00	769.157	46.211
15.990	755.00	45.00	778.574	46.405
16.250	771.00	46.00	798.179	47.622
16.420	778.00	47.00	807.425	48.778
16.610	771.00	46.00	802.330	47.869
17.270	790.00	47.00	829.462	49.348
17.750	766.00	47.00	832.364	49.646
18.330	787.00	47.00	836.989	49.985
18.710	781.00	47.00	834.104	50.196
19.130	783.00	47.00	839.939	50.418

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.194 PLUS-OR-MINUS .015 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 835.61 PLUS-OR-MINUS 5.55 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1414.38 MB
 (N,2N) THRESHOLD = 10.64 MEV
 (N,3N) THRESHOLD = 19.36 MEV
 THIS ISOTOPE HAS 32 NEUTRONS, 27 PROTONS, (MASS = 59)
 NEUTRON EXCESS PARAMETER = .08475
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .5908 PLUS-OR-MINUS .0039
 T=SOFT(N) = 6.754 T=SOFT(N) = 9.171
 ERROR .085 ERROR .115

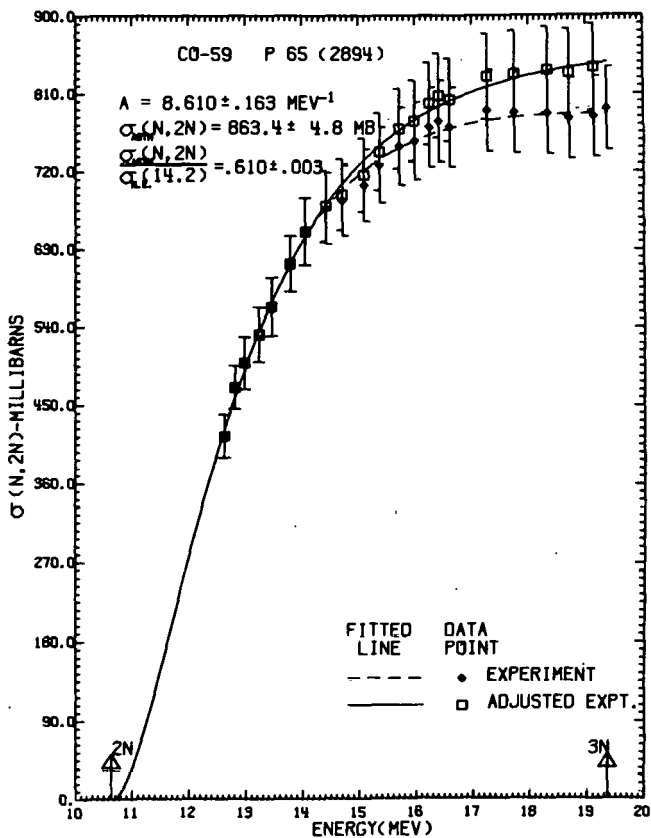


CO-59 FROM REF. P 65 (2894)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.630	414.00	25.00	414.000	25.000
12.810	470.00	25.00	470.000	25.000
12.980	498.00	30.00	498.000	30.000
13.240	531.00	32.00	531.000	32.000
13.460	563.00	34.00	563.000	34.000
13.790	613.00	32.00	613.000	32.000
14.050	650.00	39.00	650.000	39.000
14.420	677.00	41.00	679.837	41.172
14.710	686.00	41.00	692.555	41.392
15.090	704.00	42.00	715.490	42.686
15.370	727.00	44.00	742.356	44.929
15.720	749.00	45.00	769.157	46.211
15.990	755.00	45.00	778.574	46.405
16.250	771.00	46.00	798.179	47.622
16.420	778.00	47.00	807.425	48.778
16.610	771.00	46.00	802.330	47.869
17.270	790.00	47.00	829.462	49.348
17.750	766.00	47.00	832.364	49.646
18.330	787.00	47.00	836.989	49.985
18.710	781.00	47.00	834.104	50.196
19.130	783.00	47.00	839.939	50.418

FITTED PARAMETERS
 LEVEL SPACING = 8.610 PLUS-OR-MINUS .163 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 863.36 PLUS-OR-MINUS 4.82 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1414.38 MB
 (N,2N) THRESHOLD = 10.64 MEV
 (N,3N) THRESHOLD = 19.36 MEV
 THIS ISOTOPE HAS 32 NEUTRONS, 27 PROTONS, (MASS = 59)
 NEUTRON EXCESS PARAMETER = .08475
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .6104 PLUS-OR-MINUS .0034
 LEVEL SPACING = 3.717 A/SPACING = 6.852
 ERROR .070 ERROR .130



NI-58 ... FROM REF. C 66 (1910)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR		
14,200	30.00	7.00	30.000	7.000
14,900	43.00	10.00	43.565	10.131
15,200	47.00	12.00	47.867	12.221
15,400	52.00	13.00	53.138	13.285
15,500	71.00	16.00	72.674	16.377

FITTED PARAMETERS

NUCLEAR TEMP. = 2.158 PLUS-OR-MINUS 1.181 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 141.69 PLUS-OR-MINUS 99.78 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1403.47 MB
 (N,2N) THRESHOLD = 12.41 MEV
 (N,3N) THRESHOLD = 22.86 MEV

THIS ISOTOPE HAS 30 NEUTRONS, 28 PROTONS, (MASS = 58)

NEUTRON EXCESS PARAMETER = .03448

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .1010 PLUS-OR-MINUS .0711

T*SORT(N) = 11.820 T*SORT(A) = 16.435
 ERROR 6.469 ERROR 8.994

NI-58 ... FROM REF. C 66 (1910)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR		
14,200	30.00	7.00	30.000	7.000
14,900	43.00	10.00	43.565	10.131
15,200	47.00	12.00	47.867	12.221
15,400	52.00	13.00	53.138	13.285
15,500	71.00	16.00	72.674	16.377

FITTED PARAMETERS

LEVEL SPACING = 2.083 PLUS-OR-MINUS 2.893 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 189.96 PLUS-OR-MINUS 186.25 MB

RELATED DATA

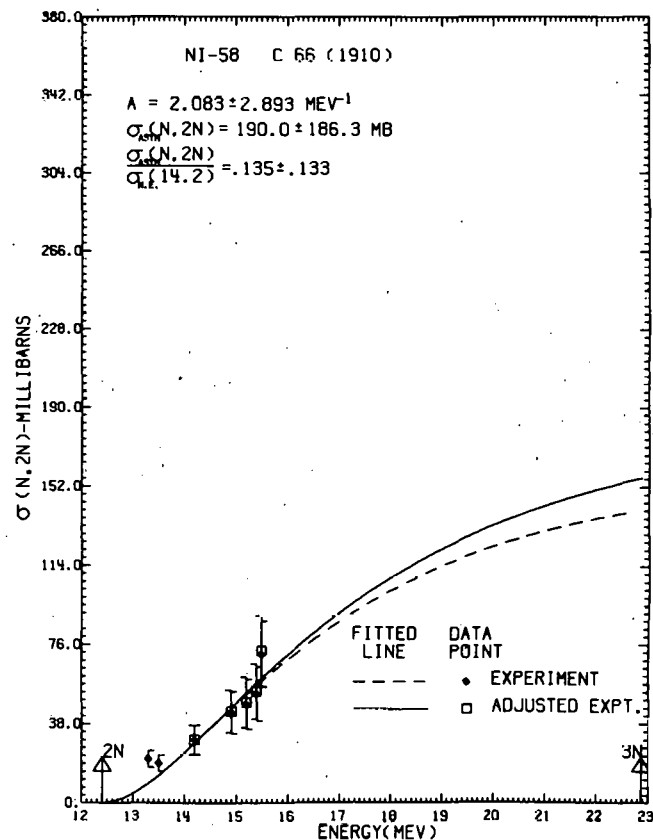
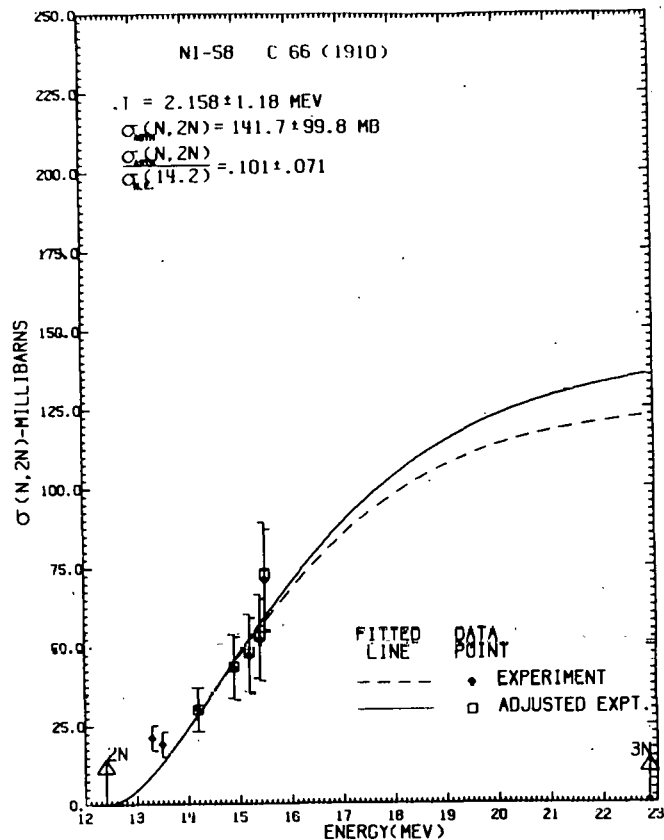
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1403.47 MB
 (N,2N) THRESHOLD = 12.41 MEV
 (N,3N) THRESHOLD = 22.86 MEV

THIS ISOTOPE HAS 30 NEUTRONS, 28 PROTONS, (MASS = 58)

NEUTRON EXCESS PARAMETER = .03448

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .1354 PLUS-OR-MINUS .1327

N/SPACING = 14.402 A/SPACING = 27.844
 ERROR 20.003 ERROR 38.672



NI-58 ... FROM REF. P 65 (892)

ENERGY (MEV)	MEASURED, ERR		N,2N CROSS SECTION (MB)	
			ADJUSTED, ERR	
3.880	19.60	1.40	19.600	1.400
14.050	22.00	1.50	22.000	1.500
14.420	29.40	2.10	29.525	2.109
14.610	33.40	2.30	33.661	2.318
14.990	38.00	2.70	38.560	2.740
15.160	39.50	2.80	40.215	2.851
15.550	43.00	3.00	44.050	3.073
15.710	44.50	3.10	45.705	3.184
16.030	46.10	3.20	47.587	3.303
16.240	47.10	3.30	48.774	3.417
16.590	50.40	3.50	52.459	3.643
16.930	49.90	3.50	52.186	3.660
17.270	51.20	3.60	53.791	3.782
17.590	55.10	3.90	58.127	4.114
17.900	55.00	3.90	58.244	4.130
18.190	56.40	4.00	59.933	4.251
18.470	58.40	4.10	62.259	4.371
18.710	60.40	4.20	64.563	4.489
18.940	60.50	4.20	64.830	4.501
19.290	63.80	4.50	68.616	4.840
19.580	66.50	4.70	71.728	5.069

FITTED PARAMETERS

NUCLEAR TEMP. = 1.367 PLUS-OR-MINUS .037 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 66.27 PLUS-OR-MINUS 1.30 MB

RELATED DATA

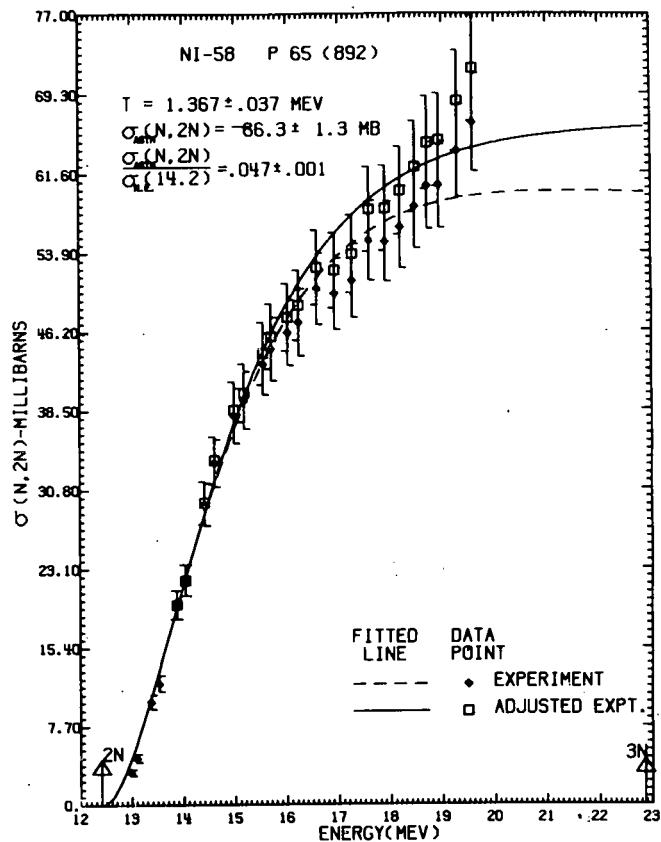
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1403.47 MB
 (N,2N) THRESHOLD = 12.41 MEV
 (N,3N) THRESHOLD = 22.86 MEV

THIS ISOTOPE HAS 30 NEUTRONS, 28 PROTONS, (MASS = 58)

NEUTRON EXCESS PARAMETER = .03448

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0472 PLUS-OR-MINUS .0009

T=SQRT(N) = 7.487 T=SQRT(A) = 10.411
 ERROR .203 ERROR .282



NI-58 ... FROM REF. P 65 (892)

ENERGY (MEV)	MEASURED, ERR		N,2N CROSS SECTION (MB)	
			ADJUSTED, ERR	
13.880	19.60	1.40	19.600	1.400
14.050	22.00	1.50	22.000	1.500
14.420	29.40	2.10	29.525	2.109
14.610	33.40	2.30	33.661	2.318
14.990	38.00	2.70	38.560	2.740
15.160	39.50	2.80	40.215	2.851
15.550	43.00	3.00	44.050	3.073
15.710	44.50	3.10	45.705	3.184
16.030	46.10	3.20	47.587	3.303
16.240	47.10	3.30	48.774	3.417
16.590	50.40	3.50	52.459	3.643
16.930	49.90	3.50	52.186	3.660
17.270	51.20	3.60	53.791	3.782
17.590	55.10	3.90	58.127	4.114
17.900	55.00	3.90	58.244	4.130
18.190	56.40	4.00	59.933	4.251
18.470	58.40	4.10	62.259	4.371
18.710	60.40	4.20	64.563	4.489
18.940	60.50	4.20	64.830	4.501
19.290	63.80	4.50	68.616	4.840
19.580	66.50	4.70	71.728	5.069

FITTED PARAMETERS

LEVEL SPACING = 6.990 PLUS-OR-MINUS .370 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 70.43 PLUS-OR-MINUS 1.46 MB

RELATED DATA

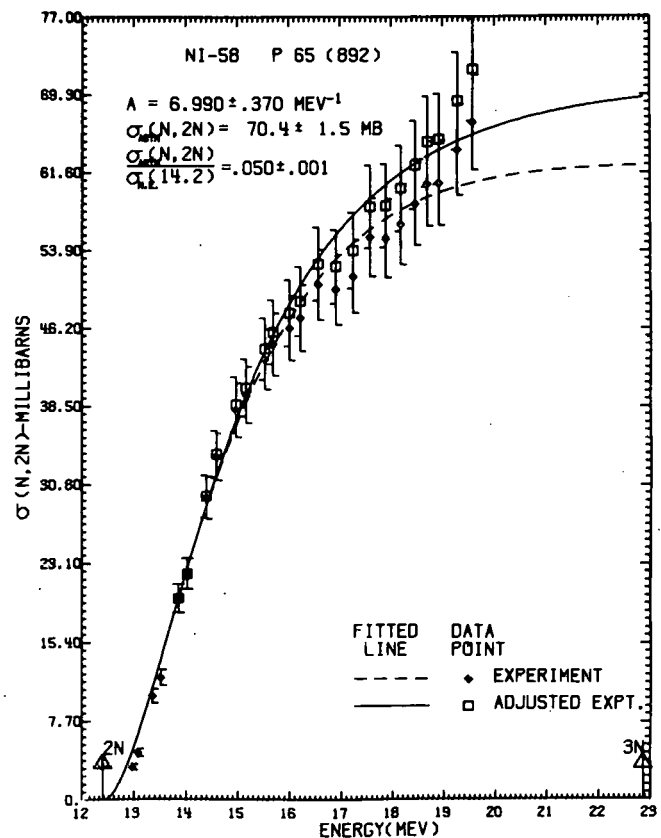
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1403.47 MB
 (N,2N) THRESHOLD = 12.41 MEV
 (N,3N) THRESHOLD = 22.86 MEV

THIS ISOTOPE HAS 30 NEUTRONS, 28 PROTONS, (MASS = 58)

NEUTRON EXCESS PARAMETER = .03448

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0502 PLUS-OR-MINUS .0010

N/SPACING = 4.292 A/SPACING = 8.298
 ERROR .227 ERROR .439



NI-58 ... FROM REF. J 63 (374)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	MEASURED, ERR	ADJUSTED, ERR
14.900	19.00	3.00	19.249	3.039
16.500	24.00	3.00	24.948	3.119
18.150	34.00	4.00	36.113	4.249
19.600	39.00	4.00	42.074	4.315
20.600	45.00	4.00	48.997	4.355
21.000	38.00	4.00	41.515	4.370

FITTED PARAMETERS

NUCLEAR TEMP. = 2.136 PLUS-MINUS .341 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 49.16 PLUS-MINUS 4.99 MB

RELATED DATA

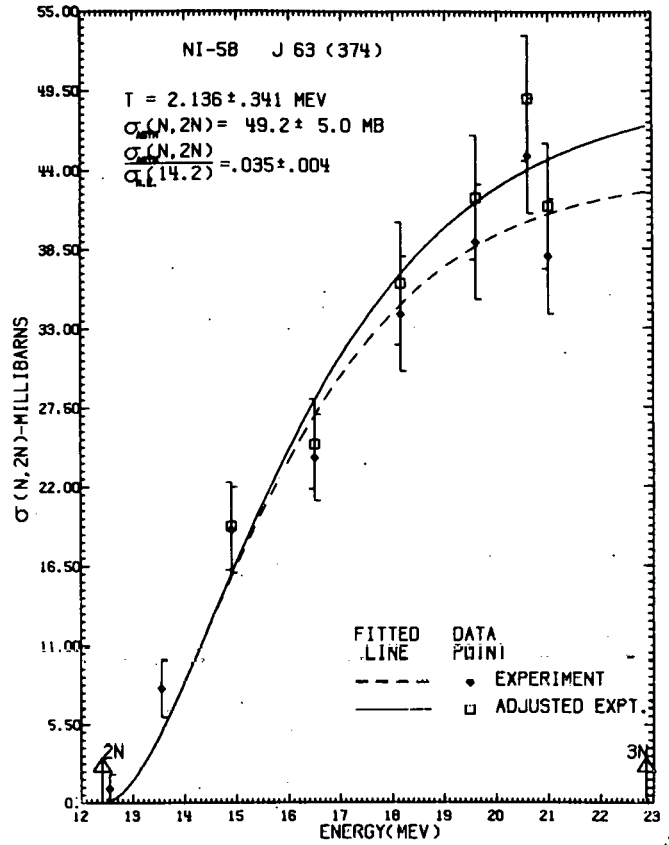
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1403.47 MB
 (N,2N) THRESHOLD = 12.41 MEV
 (N,3N) THRESHOLD = 22.86 MEV

THIS ISOTOPE HAS 30 NEUTRONS, 28 PROTONS, (MASS = 58)

NEUTRON EXCESS PARAMETER = .03448

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0350 PLUS-MINUS .0036

T*SQRT(N) = 11.699 T*SQRT(A) = 16.267
 ERROR 1.868 ERROR 2.597



NI-58 ... FROM REF. J 63 (374)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	MEASURED, ERR	ADJUSTED, ERR
14.900	19.00	3.00	19.249	3.039
16.500	24.00	3.00	24.948	3.119
18.150	34.00	4.00	36.113	4.249
19.600	39.00	4.00	42.074	4.315
20.600	45.00	4.00	48.997	4.355
21.000	38.00	4.00	41.515	4.370

FITTED PARAMETERS

LEVEL SPACING = 2.940 PLUS-MINUS 1.051 PFR MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 54.22 PLUS-MINUS 7.30 MB

RELATED DATA

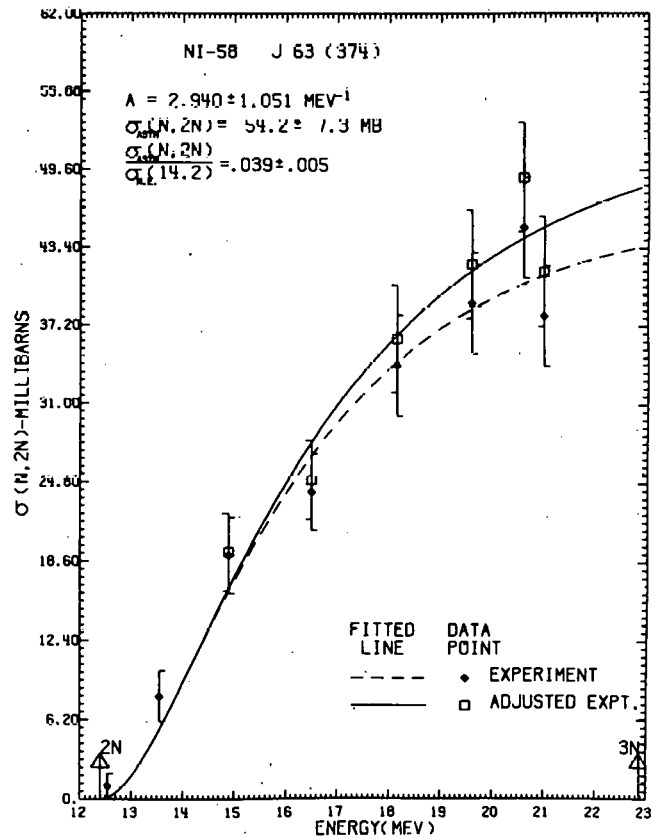
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1403.47 MB
 (N,2N) THRESHOLD = 12.41 MEV
 (N,3N) THRESHOLD = 22.86 MEV

THIS ISOTOPE HAS 30 NEUTRONS, 28 PROTONS, (MASS = 58)

NEUTRON EXCESS PARAMETER = .03448

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0386 PLUS-MINUS .0052

N/SPACING = 10.204 A/SPACING = 19.728
 ERROR 3.648 ERROR 7.052



NI-58 ... FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED, ERR		N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
13,880	21,40	1,10	21,400	1,100		
14,090	23,50	1,20	23,500	1,200		
14,310	31,10	1,60	31,166	1,603		
14,500	34,30	1,70	34,497	1,710		
14,810	39,30	2,00	39,752	2,023		
16,500	53,30	4,30	55,406	4,470		
17,950	67,60	3,40	71,631	3,603		
19,760	77,40	3,90	83,631	4,214		

FITTED PARAMETERS

NUCLEAR TEMP. = 1.524 PLUS-OR-MINUS .072 MEV
ASYMPTOTIC (N,2N) CROSS SECTION = 83,60 PLUS-OR-MINUS 4,19 MB

RELATED DATA

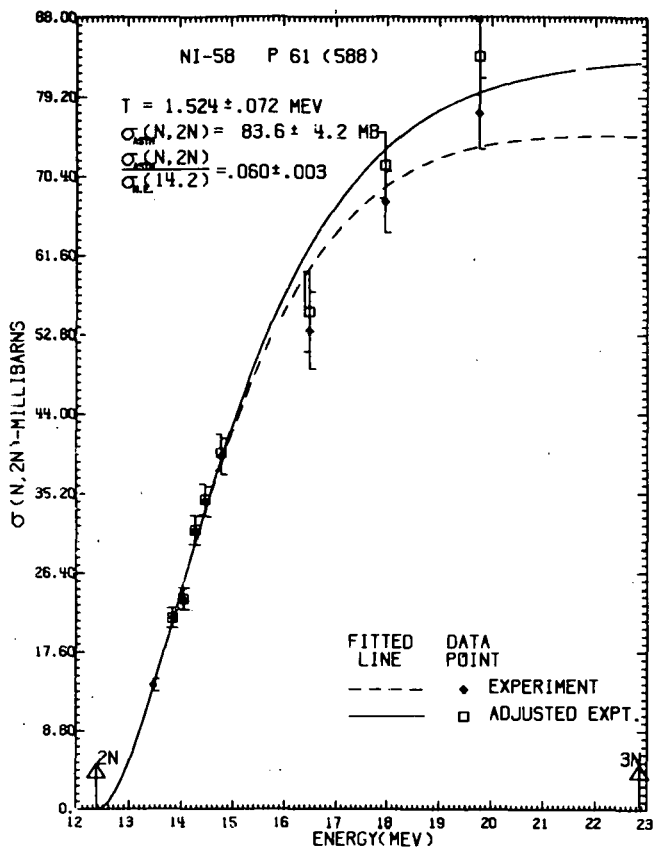
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1403.47 MB
(N,2N) THRESHOLD = 12.41 MEV
(N,3N) THRESHOLD = 22.86 MEV

THIS ISOTOPE HAS 30 NEUTRONS, 28 PROTONS, (MASS = 58)

NEUTRON EXCESS PARAMETER = .03448

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
.0596 PLUS-OR-MINUS .0030

T*SQRT(N) = 8,347 T*SQRT(A) = 11,606
ERROR .394 ERROR .548



NI-58 ... FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED, ERR		N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
13,880	21,40	1,10	21,400	1,100		
14,090	23,50	1,20	23,500	1,200		
14,310	31,10	1,60	31,166	1,603		
14,500	34,30	1,70	34,497	1,710		
14,810	39,30	2,00	39,752	2,023		
16,500	53,30	4,30	55,406	4,470		
17,950	67,60	3,40	71,631	3,603		
19,760	77,40	3,90	83,631	4,214		

FITTED PARAMETERS

LEVEL SPACING = 5.460 PLUS-OR-MINUS .552 PER MEV
ASYMPTOTIC (N,2N) CROSS SECTION = 90.24 PLUS-OR-MINUS 5.05 MB

RELATED DATA

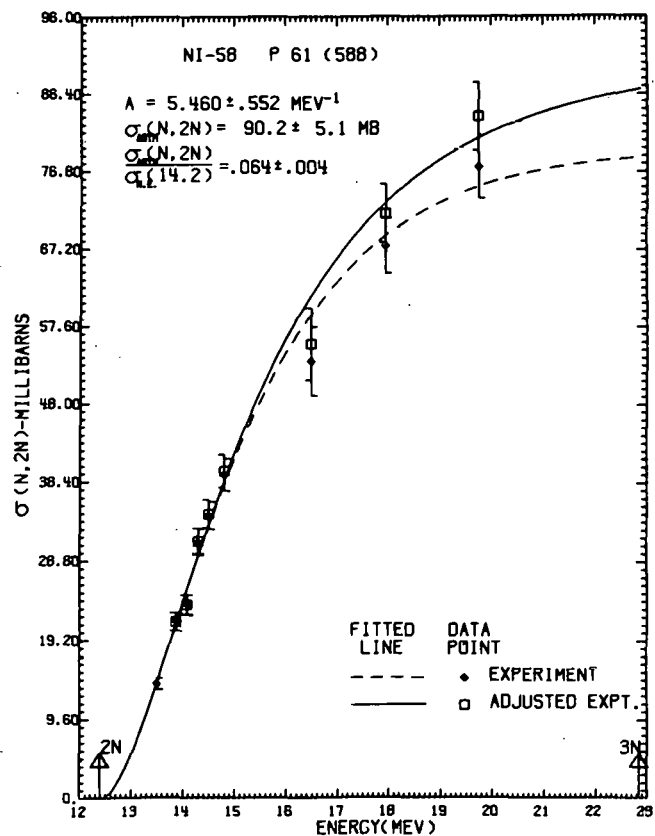
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1403.47 MB
(N,2N) THRESHOLD = 12.41 MEV
(N,3N) THRESHOLD = 22.86 MEV

THIS ISOTOPE HAS 30 NEUTRONS, 28 PROTONS, (MASS = 58)

NEUTRON EXCESS PARAMETER = .03448

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
.0643 PLUS-OR-MINUS .0036

N/SPACING = 5,495 A/SPACING = 10,623
ERROR .555 ERROR 1.074



CU-63 ...FROM REF. B 69

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.200	400.00	35.00	400.000	35.000
14.100	560.00	40.00	560.000	40.000
15.450	705.00	50.00	720.102	51.071
16.000	740.00	50.00	762.120	51.495
16.500	765.00	50.00	793.406	51.857
17.050	795.00	60.00	830.471	62.677
17.450	865.00	60.00	908.047	62.986
18.000	890.00	60.00	940.246	63.387

FITTED PARAMETERS

NUCLEAR TEMP. = 1.565 PLUS-OR-MINUS .080 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 950.62 PLUS-OR-MINUS 29.29 MB

RELATED DATA

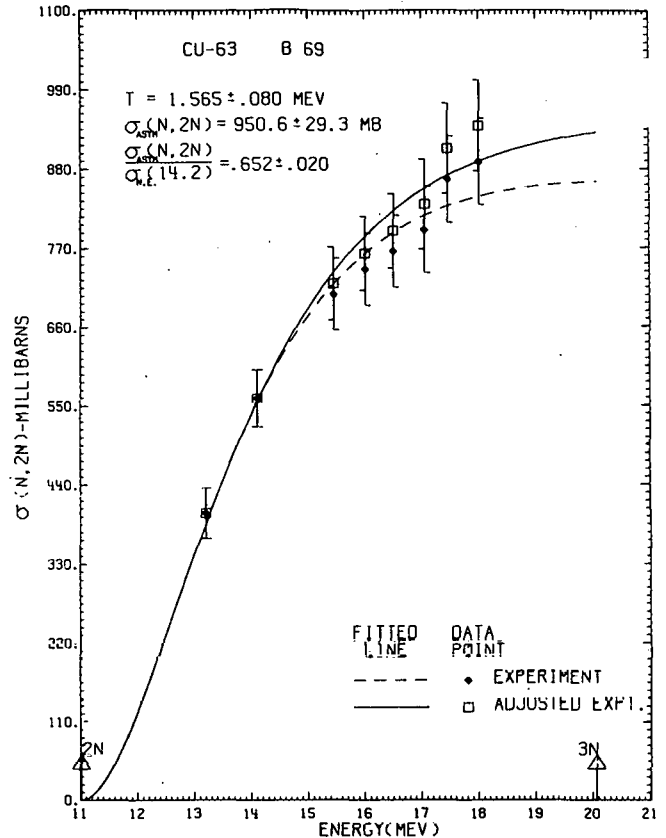
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)

NEUTRON EXCESS PARAMETER = .07937

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6524 PLUS-OR-MINUS .0201

T=30RT(N) = 9.120 T=30AT(A) = 12.422
 ERROR .460 ERROR .635



CU-63 ...FROM REF. B 69

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.200	400.00	35.00	400.000	35.000
14.100	560.00	40.00	560.000	40.000
15.450	705.00	50.00	720.102	51.071
16.000	740.00	50.00	762.120	51.495
16.500	765.00	50.00	793.406	51.857
17.050	795.00	60.00	830.471	62.677
17.450	865.00	60.00	908.047	62.986
18.000	890.00	60.00	940.246	63.387

FITTED PARAMETERS

LEVEL SPACING = 4.847 PLUS-OR-MINUS .466 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1028.25 PLUS-OR-MINUS 34.63 MB

RELATED DATA

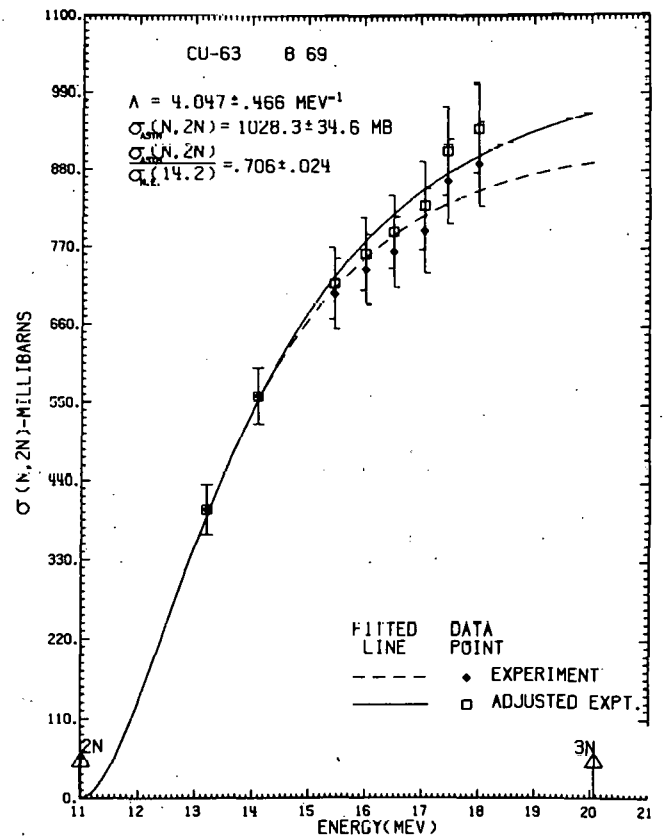
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)

NEUTRON EXCESS PARAMETER = .07937

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7057 PLUS-OR-MINUS .0238

N/SPACING = 7.015 A/SPACING = 12.998
 ERROR .674 ERROR 1.250



CU-63 ... FROM REF. R 63 (2063)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR	ADJUSTED	ERR
12.610	170.00	15.30	170.000	15.300
13.000	248.00	22.30	248.000	22.300
13.470	310.00	27.90	310.000	27.900
13.470	317.00	28.50	317.000	28.500
14.050	422.00	38.00	422.000	38.000
15.240	525.00	47.25	534.471	48.102
15.880	531.00	47.80	545.916	49.143
15.880	600.00	54.00	616.854	55.517
16.560	631.00	56.70	654.961	58.853
17.240	602.00	54.20	630.350	56.752
17.860	639.00	57.50	674.014	60.651
18.410	658.00	59.20	698.248	62.821
18.880	683.00	61.50	728.278	65.577
19.230	645.00	58.00	690.102	62.056
19.480	658.00	59.20	705.658	63.488
19.480	689.00	62.00	738.904	66.491
19.570	653.00	58.80	700.872	63.111

FITTED PARAMETERS

NUCLEAR TEMP. = 1.703 PLUS-OR-MINUS .038 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 746.96 PLUS-OR-MINUS 12.32 MB

RELATED DATA

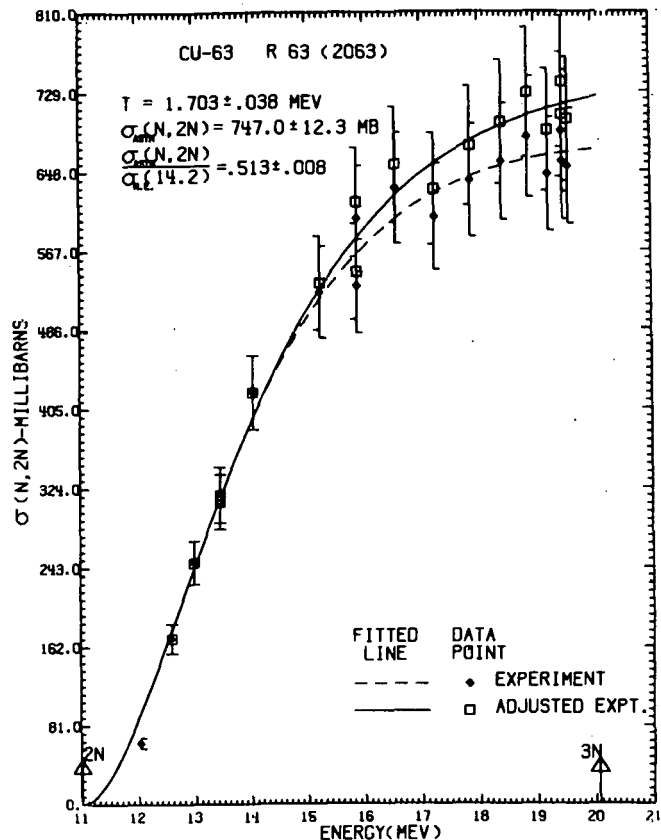
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)

NEUTRON EXCESS PARAMETER = .07937

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5127 PLUS-OR-MINUS .0085

T=SQRT(N) = 9.930 T=SQRT(A) = 13.517
 ERROR .222 ERROR .302



CU-63 ... FROM REF. R 63 (2063)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR	ADJUSTED	ERR
12.610	170.00	15.30	170.000	15.300
13.000	248.00	22.30	248.000	22.300
13.470	310.00	27.90	310.000	27.900
13.470	317.00	28.50	317.000	28.500
14.050	422.00	38.00	422.000	38.000
15.240	525.00	47.25	534.471	48.102
15.880	531.00	47.80	545.916	49.143
15.880	600.00	54.00	616.854	55.517
16.560	631.00	56.70	654.961	58.853
17.240	602.00	54.20	630.350	56.752
17.860	639.00	57.50	674.014	60.651
18.410	658.00	59.20	698.248	62.821
18.880	683.00	61.50	728.278	65.577
19.230	645.00	58.00	690.102	62.056
19.480	658.00	59.20	705.658	63.488
19.480	689.00	62.00	738.904	66.491
19.570	653.00	58.80	700.872	63.111

FITTED PARAMETERS

LEVEL SPACING = 4.032 PLUS-OR-MINUS .238 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 810.04 PLUS-OR-MINUS 19.85 MB

RELATED DATA

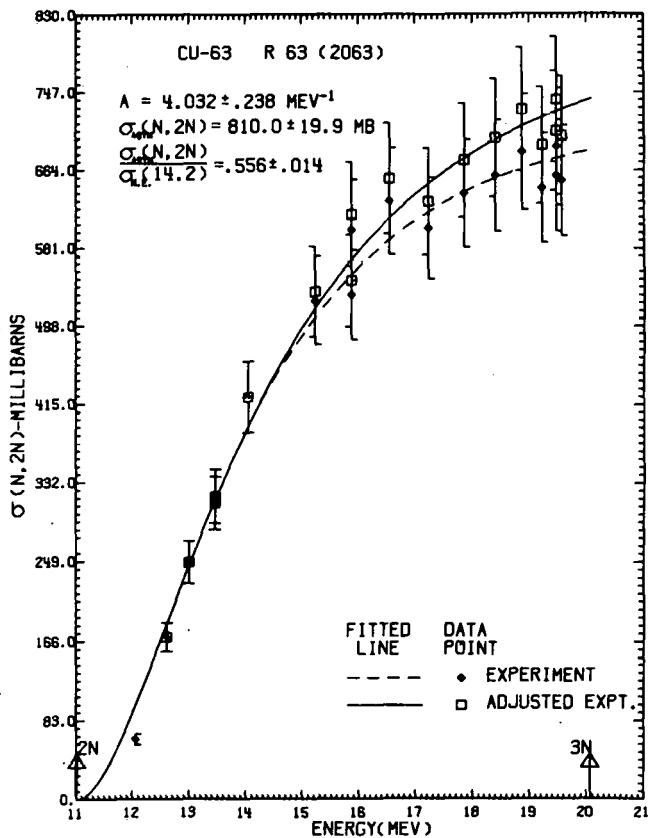
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)

NEUTRON EXCESS PARAMETER = .07937

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5560 PLUS-OR-MINUS .0136

LEVEL SPACING = 8.433 A/SPACING = 15.625
 ERROR .498 ERROR .922



CU-63 FROM REF. G 62 (872)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.800	424.00 21.20	424.000 21.200	
14.110	455.00 22.75	455.000 22.750	
14.370	488.00 24.40	489.514 24.476	
14.590	519.00 25.95	522.646 26.132	
14.770	550.00 27.50	555.588 27.779	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.741 PLUS-OR-MINUS .127 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 864.61 PLUS-OR-MINUS 60.29 MB

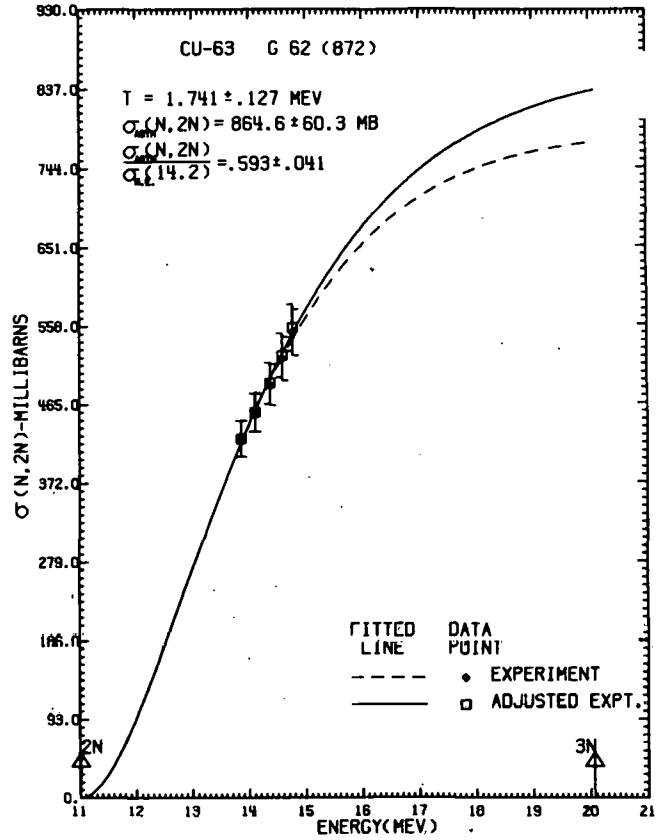
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)
 NEUTRON EXCESS PARAMETER = .07937

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5934 PLUS-OR-MINUS .0414

T*SQRT(N) = 10.152 T*SQRT(A) = 13.819
 ERROR .741 ERROR 1.008



CU-63 FROM REF. G 62 (872)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.800	424.00 21.20	424.000 21.200	
14.110	455.00 22.75	455.000 22.750	
14.370	488.00 24.40	489.514 24.476	
14.590	519.00 25.95	522.646 26.132	
14.770	550.00 27.50	555.588 27.779	

FITTED PARAMETERS

LEVEL SPACING = 3.432 PLUS-OR-MINUS .581 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1016.92 PLUS-OR-MINUS 92.98 MB

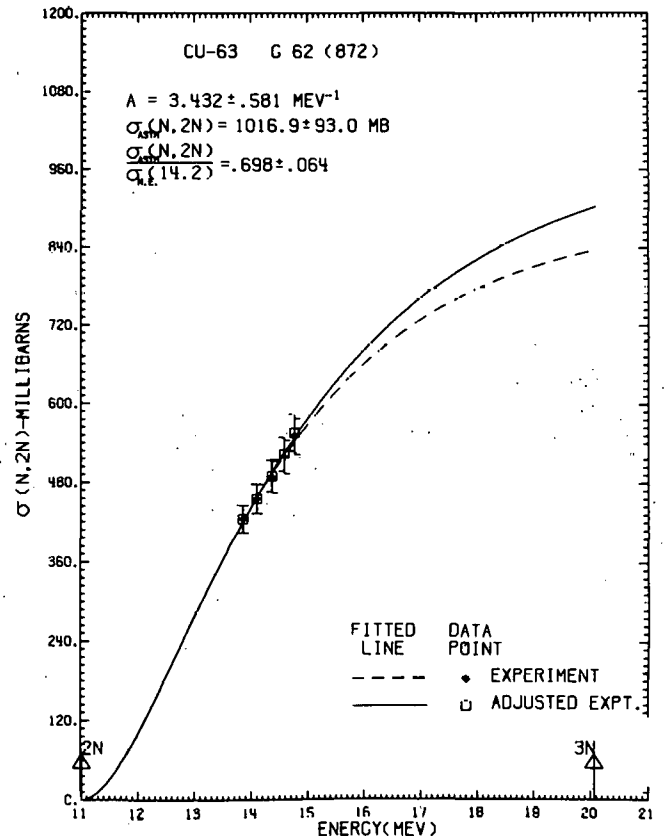
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)
 NEUTRON EXCESS PARAMETER = .07937

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6980 PLUS-OR-MINUS .0638

N/SPACING = 9.90/ A/SPACING = 18.357
 ERROR 1.677 ERROR 3.108



CU-63 FROM REF. L 65 (1847)

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
227.00	14.00	227.000 14.000
264.00	17.00	264.000 17.000
315.00	21.00	315.000 21.000
340.00	22.00	340.000 22.000
450.00	30.00	450.000 30.000
479.00	32.00	479.000 32.000
554.00	38.00	554.000 38.000
575.00	39.00	575.423 39.029
598.00	41.00	600.394 41.164
619.00	42.00	625.609 42.448
660.00	44.00	669.176 44.612
715.00	48.00	727.196 48.819
738.00	49.00	754.976 50.127
762.00	50.00	781.427 51.275
808.00	53.00	832.514 54.608
811.00	51.00	838.924 52.756
819.00	51.00	849.641 52.908
834.00	49.00	867.856 50.989
850.00	57.00	886.572 59.452
849.00	56.00	889.310 58.659
853.00	56.00	896.938 58.885
858.00	56.00	915.976 59.095
868.00	56.00	932.687 60.344
881.00	57.00	972.644 62.648
916.00	59.00	991.024 62.804
931.00	59.00	1001.844 62.949
939.00	59.00	1007.372 62.091
941.00	58.00	1036.913 61.184
966.00	57.00	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.790 PLUS-OR-MINUS .020 MEV
ASYMPTOTIC (N,2N) CROSS SECTION = 1053.84 PLUS-OR-MINUS 9.67 MB

RELATED DATA

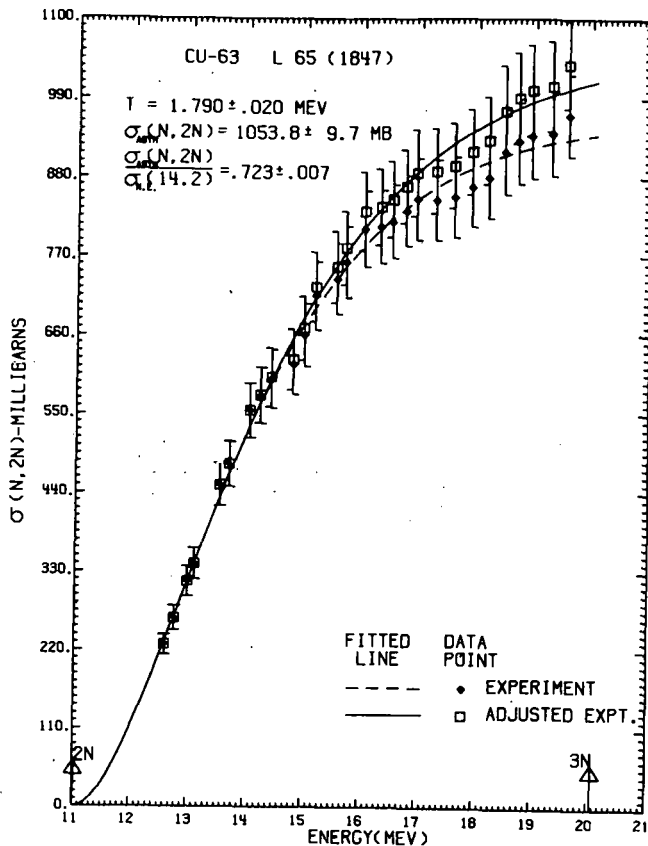
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
(N,2N) THRESHOLD = 11.02 MEV
(N,3N) THRESHOLD = 20.06 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)

NEUTRON EXCESS PARAMETER = .07937

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
.7233 PLUS-OR-MINUS .0066

T*SQRT(N) = 10.437 T*SQRT(A) = 14.208
ERROR .117 ERROR .159



CU-63 FROM REF. L 65 (1847)

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
12.600	227.00	227.000 14.000
12.760	264.00	264.000 17.000
12.980	315.00	315.000 21.000
13.100	340.00	340.000 22.000
13.540	450.00	450.000 30.000
13.700	479.00	479.000 32.000
14.050	554.00	554.000 38.000
14.240	575.00	575.423 39.029
14.420	598.00	600.394 41.164
14.800	619.00	625.609 42.448
14.990	660.00	669.176 44.612
15.180	715.00	727.196 48.819
15.550	738.00	754.976 50.127
15.710	762.00	781.427 51.275
16.030	808.00	832.514 54.608
16.310	811.00	838.924 52.756
16.520	819.00	849.641 52.908
16.750	834.00	867.856 50.989
16.930	850.00	886.572 59.452
17.270	849.00	889.310 58.659
17.590	853.00	896.938 58.885
17.900	868.00	915.976 59.095
18.190	881.00	932.687 60.344
18.470	916.00	972.644 62.648
18.710	931.00	991.024 62.804
18.940	939.00	1001.844 62.949
19.290	941.00	1007.372 62.091
19.580	966.00	1036.913 61.184

FITTED PARAMETERS

LEVEL SPACING = 3.538 PLUS-OR-MINUS .111 PER MEV
ASYMPTOTIC (N,2N) CROSS SECTION = 1170.96 PLUS-OR-MINUS 16.69 MB

RELATED DATA

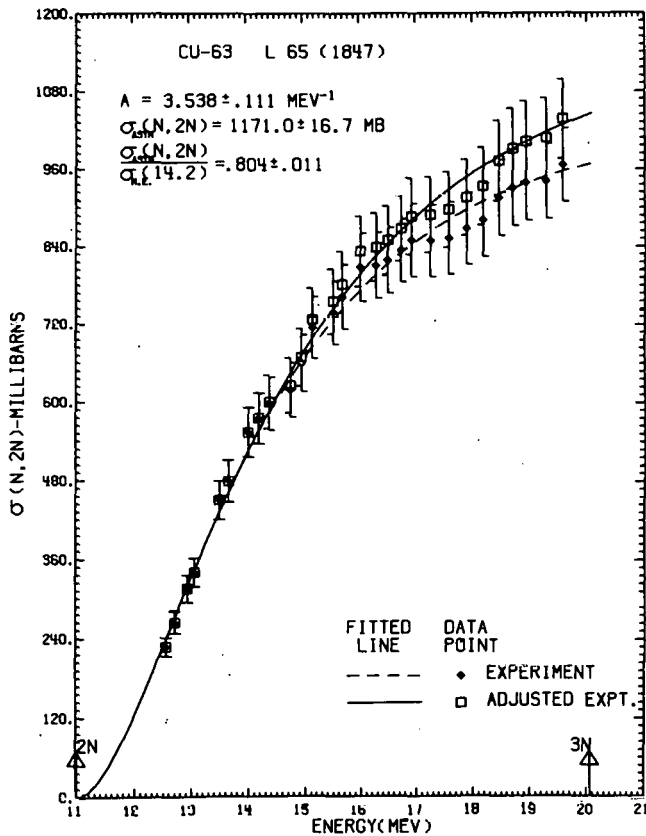
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
(N,2N) THRESHOLD = 11.02 MEV
(N,3N) THRESHOLD = 20.06 MEV

ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)

EXCESS PARAMETER = .07937

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
.8037 PLUS-OR-MINUS .0115

N/SPACING = 9.610 A/SPACING = 17.807
ERROR .301 ERROR .559



CU-63 ...FROM REF, K 62 (770)

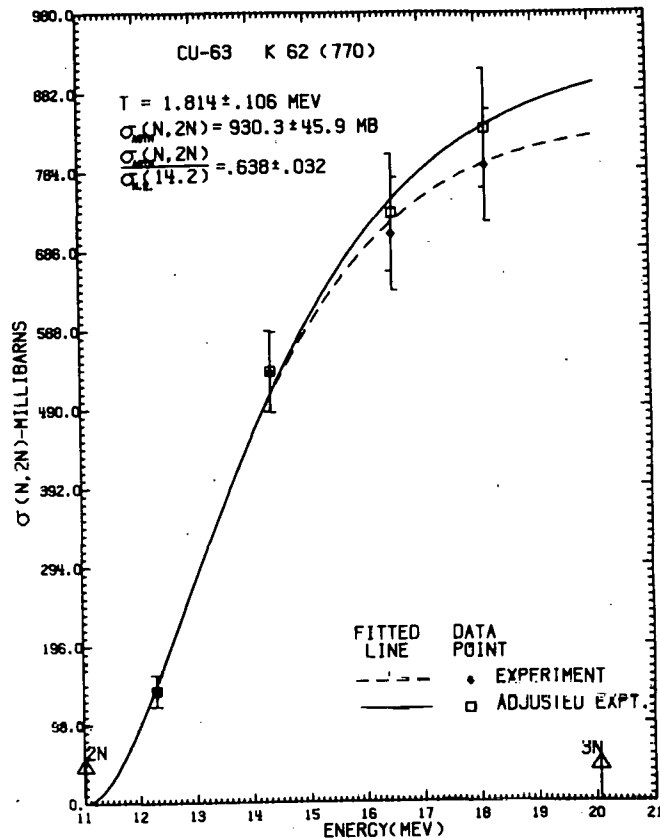
ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR		
12.300	140.00	20.00	140.000	20.000
14.350	535.00	50.00	536.466	50.137
16.500	705.00	70.00	731.178	72.599
18.150	790.00	70.00	835.983	74.074

FITTED PARAMETERS

NUCLEAR TEMP. = 1.814 PLUS-OR-MINUS .106 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 930.25 PLUS-OR-MINUS 45.91 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV
 THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)
 NEUTRON EXCESS PARAMETER = .07937
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6385 PLUS-OR-MINUS .0315
 T*SQRT(N) = 10.577 T*SQRT(A) = 14.398
 ERROR .618 ERROR .841



CU-63 ...FROM REF, K 62 (770)

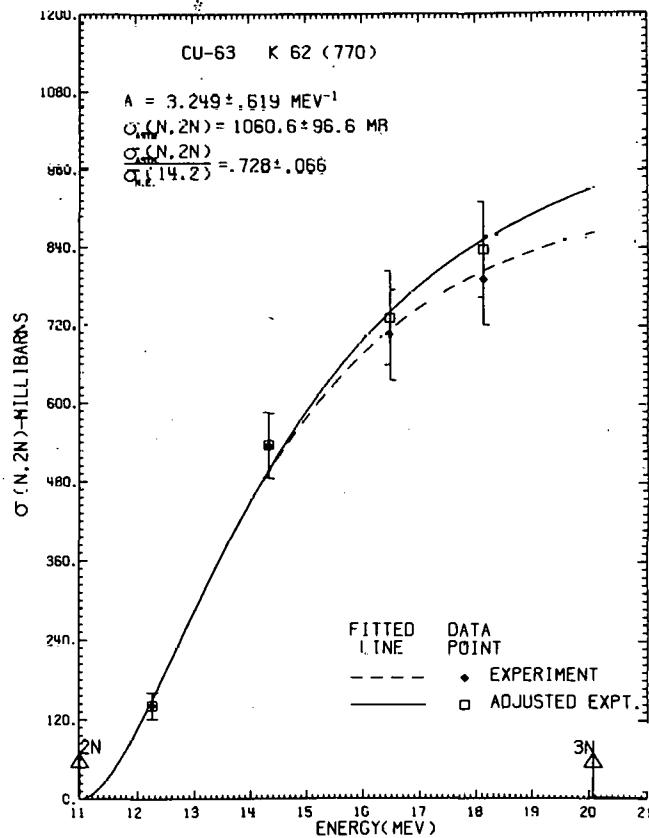
ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR		
12.300	140.00	20.00	140.000	20.000
14.350	535.00	50.00	536.466	50.137
16.500	705.00	70.00	731.178	72.599
18.150	790.00	70.00	835.983	74.074

FITTED PARAMETERS

LEVEL SPACING = 3.249 PLUS-OR-MINUS .619 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1060.57 PLUS-OR-MINUS 96.62 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV
 THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)
 NEUTRON EXCESS PARAMETER = .07937
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7279 PLUS-OR-MINUS .0663
 N/SPACING = 10.465 A/SPACING = 19.391
 ERROR 1.994 ERROR 3.694



CU-63 ...FROM REF, F 60 (602)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.810	233.00	21.00	233.000 21.000
13.770	378.00	34.00	378.000 34.000
14.740	507.00	45.00	511.889 45.434
15.700	649.00	58.00	666.244 59.541
16.960	758.00	68.00	790.917 70.953
17.980	836.00	75.00	883.001 79.217

FITTED PARAMETERS

NUCLEAR TEMP. = 2.036 PLUS-OR-MINUS .121 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 993.75 PLUS-OR-MINUS 57.41 MB

RELATED DATA

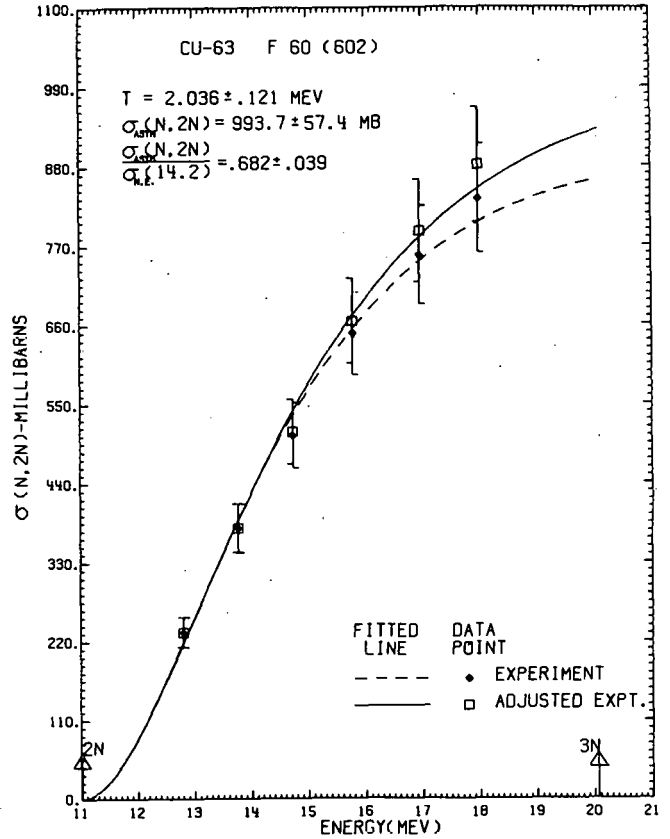
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)

NEUTRON EXCESS PARAMETER = .07937

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6821 PLUS-OR-MINUS .0394

T=SORT(N) = 11.872 T=SORT(A) = 16.160
 ERROR .706 ERROR .960



CU-63 ...FROM REF, F 60 (602)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.810	233.00	21.00	233.000 21.000
13.770	378.00	34.00	378.000 34.000
14.740	507.00	45.00	511.889 45.434
15.700	649.00	58.00	666.244 59.541
16.960	758.00	68.00	790.917 70.953
17.980	836.00	75.00	883.001 79.217

FITTED PARAMETERS

LEVEL SPACING = 2.526 PLUS-OR-MINUS .271 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1174.96 PLUS-OR-MINUS 68.85 MB

RELATED DATA

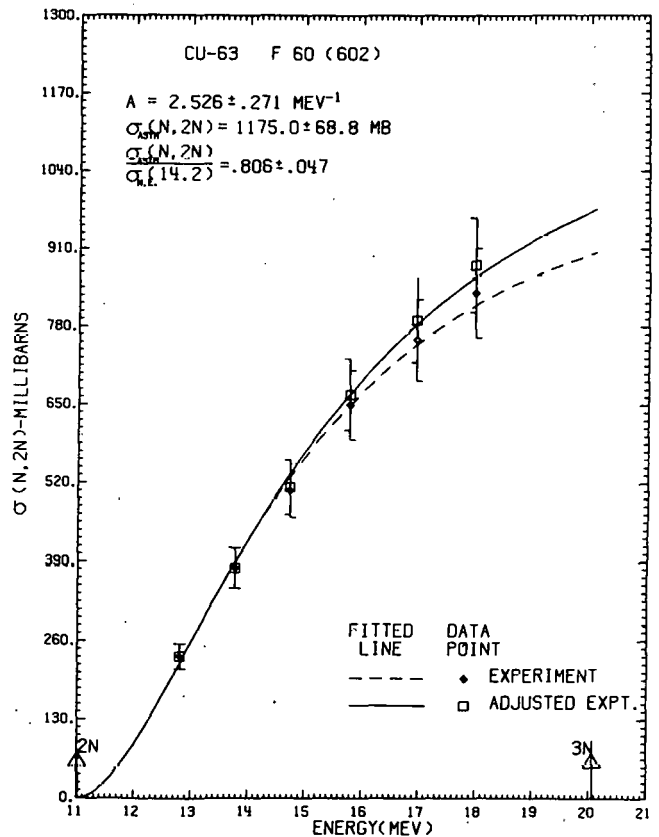
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)

NEUTRON EXCESS PARAMETER = .07937

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8064 PLUS-OR-MINUS .0473

N/SPACING = 13.460 A/SPACING = 24.941
 ERROR 1.444 ERROR 2.676

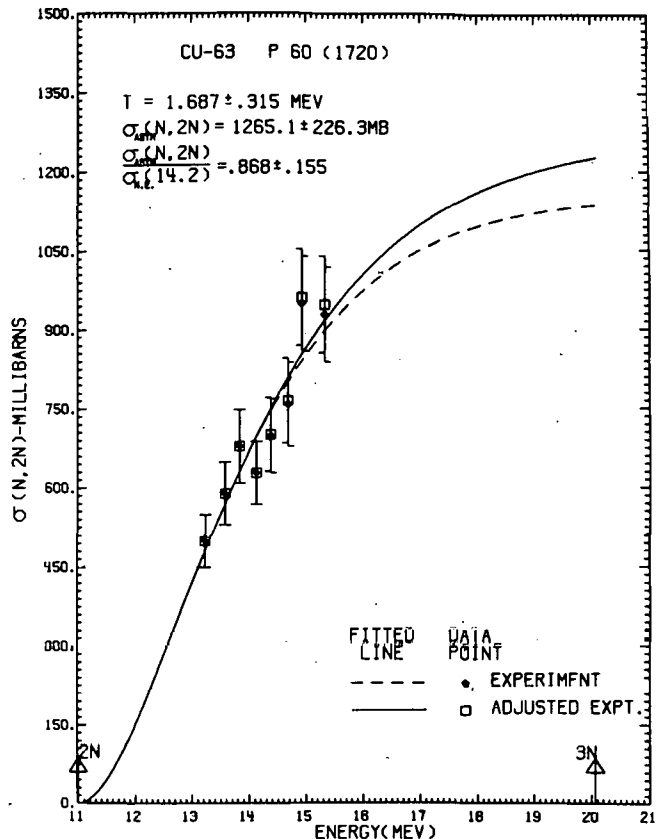


CU-63 ...FROM REF, P 60 (1720)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED	ERR	ADJUSTED	ERR
13.250	500.00	50.00	500.000	50.000
13.600	590.00	60.00	590.000	60.000
13.850	680.00	70.00	680.000	70.000
14.150	630.00	60.00	630.000	60.000
14.400	700.00	70.00	702.550	70.255
14.700	760.00	80.00	766.801	80.716
14.950	950.00	90.00	962.568	91.191
15.350	930.00	90.00	948.434	91.784

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.687 PLUS-OR-MINUS .315 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1265.15 PLUS-OR-MINUS 226.26 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV
 THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)
 NEUTRON EXCESS PARAMETER = .07937
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8683 PLUS-OR-MINUS .1553
 I/SUM(I) = 9.837 I/SUM(I) = 13.390
 ERROR 1.037 ERROR 2.500

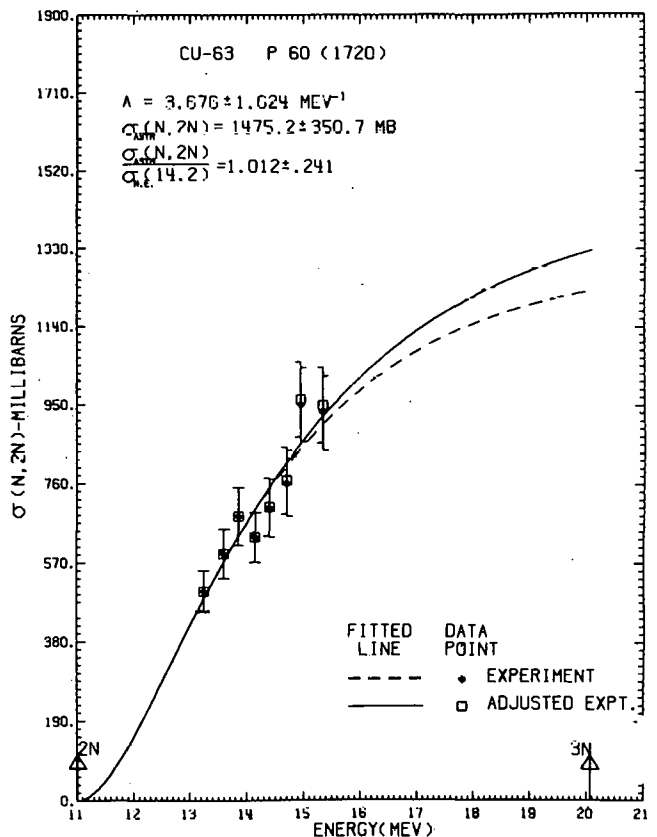


CU-63 ...FROM REF, P 60 (1720)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED	ERR	ADJUSTED	ERR
13.250	500.00	50.00	500.000	50.000
13.600	590.00	60.00	590.000	60.000
13.850	680.00	70.00	680.000	70.000
14.150	630.00	60.00	630.000	60.000
14.400	700.00	70.00	702.550	70.255
14.700	760.00	80.00	766.801	80.716
14.950	950.00	90.00	962.568	91.191
15.350	930.00	90.00	948.434	91.784

FITTED PARAMETERS
 LEVEL SPACING = 3.676 PLUS-OR-MINUS 1.624 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1475.17 PLUS-OR-MINUS 350.66 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV
 THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)
 NEUTRON EXCESS PARAMETER = .07937
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.0125 PLUS-OR-MINUS .2407
 N/SPACING = 9.249 A/SPACING = 17.138
 ERROR 4.086 ERROR 7.571



CU-63 ...FROM REF. A 59 (601)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.250	215.00	45.00	215.000	45.000	
14.300	650.00	65.00	651.191	65.119	
16.450	880.00	90.00	912.056	93.278	
18.200	960.00	100.00	1016.432	105.878	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.530 PLUS-OR-MINUS .066 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1054.35 PLUS-OR-MINUS 30.98 MB

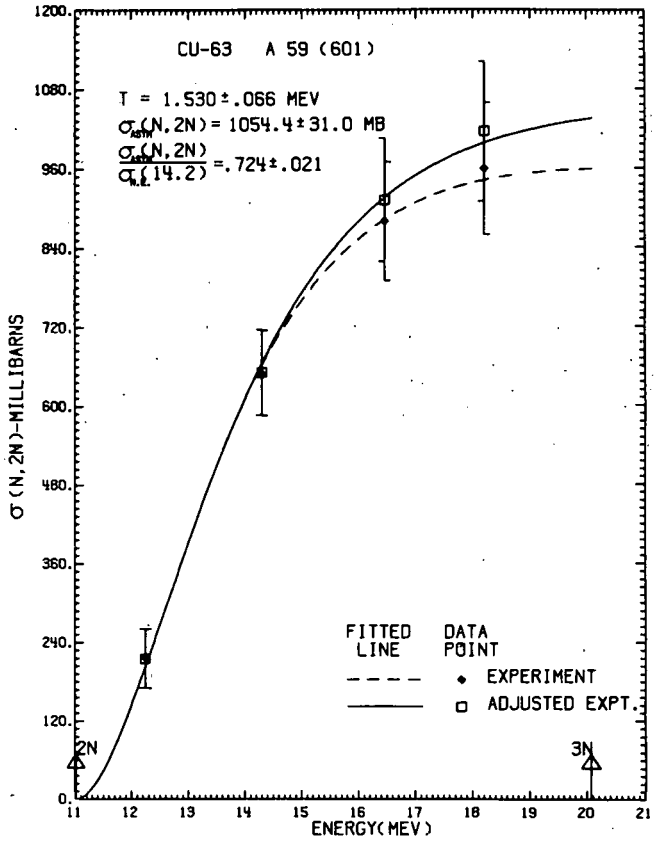
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)
 NEUTRON EXCESS PARAMETER = .07937

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7236 PLUS-OR-MINUS .0213

T*SQRT(N) = 8.921 T*SQRT(A) = 12.144
 ERROR .385 ERROR .524



CU-63 ...FROM REF. A 59 (601)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.250	215.00	45.00	215.000	45.000	
14.300	650.00	65.00	651.191	65.119	
16.450	880.00	90.00	912.056	93.278	
18.200	960.00	100.00	1016.432	105.878	

FITTED PARAMETERS

LEVEL SPACING = 4.970 PLUS-OR-MINUS .151 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1140.36 PLUS-OR-MINUS 13.31 MB

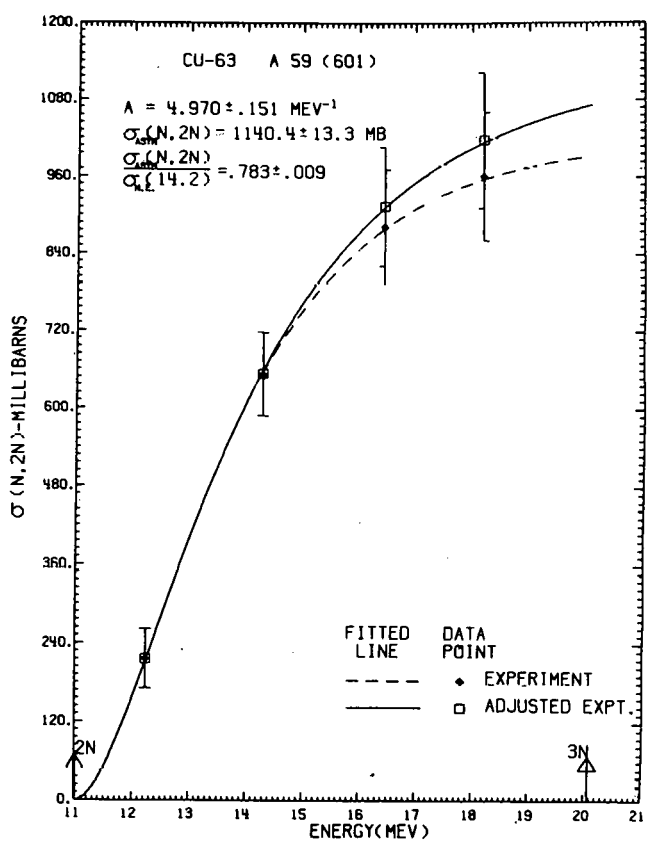
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)
 NEUTRON EXCESS PARAMETER = .07937

RATIO OF ASYMPTOTIC (N,2N) TO 14.2-MEV NON-ELASTIC
 .7827 PLUS-OR-MINUS .0091

N/SPACING = 6.841 A/SPACING = 12.676
 ERROR .208 ERROR .385



CU-63 ...FROM REF. C 56 (36)

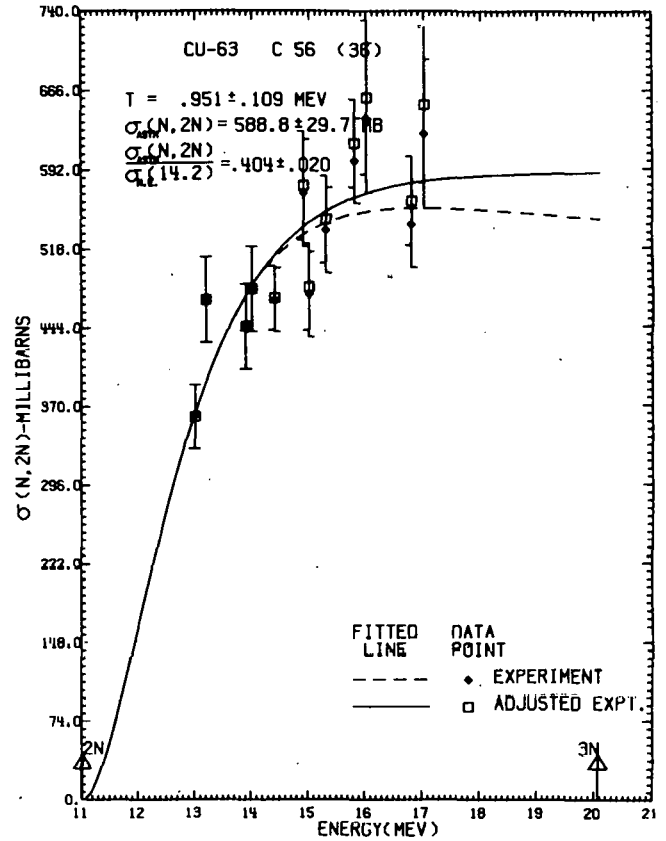
ENERGY (MEV)	MEASURED	N, 2N CROSS SECTION (MB)	ADJUSTED	ERR
13.000	360.00	30.00	360.000	30.000
13.200	470.00	40.00	470.000	40.000
13.900	445.00	40.00	445.000	40.000
14.000	480.00	40.00	480.000	40.000
14.400	470.00	30.00	471.712	30.109
14.900	570.00	50.00	577.059	50.619
15.000	475.00	40.00	481.684	40.563
15.300	535.00	40.00	545.173	40.761
15.800	600.00	40.00	616.125	41.075
16.000	640.00	70.00	659.131	72.092
16.800	540.00	40.00	562.289	41.651
17.000	625.00	70.00	652.473	73.077

FITTED PARAMETERS

NUCLEAR TEMP. = .951 PLUS-OR-MINUS .109 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 588.76 PLUS-OR-MINUS 29.75 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV
 THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)
 NEUTRON EXCESS PARAMETER = .07937
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4041 PLUS-OR-MINUS .0204
 T=30MIN(A) = 5.545 T=50RT(A) = 7.548
 ERROR .636 ERROR .865



CU-63 ...FROM REF. C 56 (36)

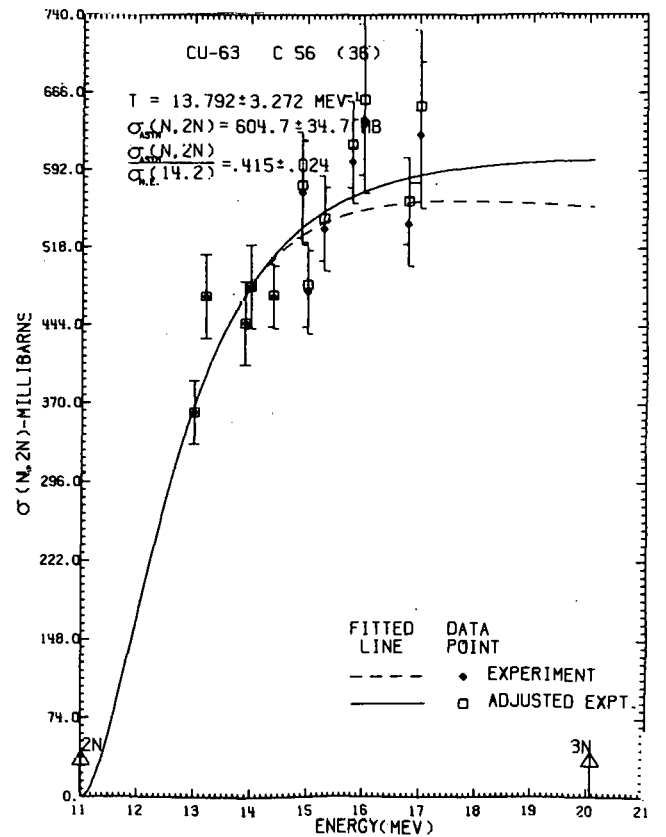
ENERGY (MEV)	MEASURED	N, 2N CROSS SECTION (MB)	ADJUSTED	ERR
13.000	360.00	30.00	360.000	30.000
13.200	470.00	40.00	470.000	40.000
13.900	445.00	40.00	445.000	40.000
14.000	480.00	40.00	480.000	40.000
14.400	470.00	30.00	471.712	30.109
14.900	570.00	50.00	577.059	50.619
15.000	475.00	40.00	481.684	40.563
15.300	535.00	40.00	545.173	40.761
15.800	600.00	40.00	616.125	41.075
16.000	640.00	70.00	659.131	72.092
16.800	540.00	40.00	562.289	41.651
17.000	625.00	70.00	652.473	73.077

FITTED PARAMETERS

LEVEL SPACING = 13.792 PLUS-OR-MINUS 3.272 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 604.68 PLUS-OR-MINUS 34.72 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV
 THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)
 NEUTRON EXCESS PARAMETER = .07937
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4150 PLUS-OR-MINUS .0238
 N/SPACING = 2.465 A/SPACING = 4.568
 ERROR .585 ERROR 1.084



2

CU-63 ... FROM REF. B 52 (83)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.500	650.00	70.00	653.531 70.380
16.900	810.00	80.00	844.526 83.410
19.400	950.00	90.00	1018.054 96.447

FITTED PARAMETERS

NUCLEAR TEMP. = 1.643 PLUS-OR-MINUS .240 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1020.30 PLUS-OR-MINUS 78.52 MB

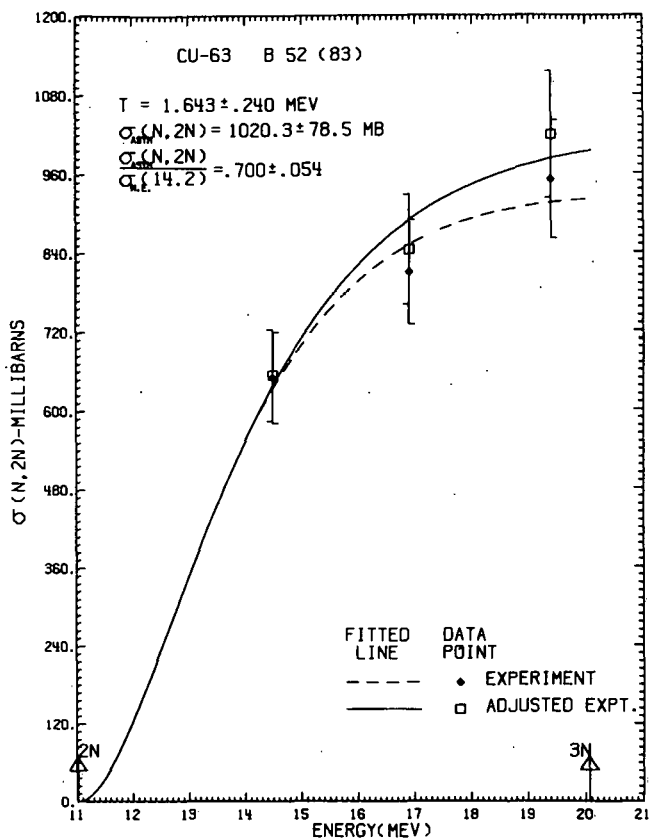
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)
 NEUTRON EXCESS PARAMETER = .07937

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7003 PLUS-OR-MINUS .0539

T*SORT(N) = 9.580 T*SORT(A) = 13.041
 ERROR 1.399 ERROR 1.905



CU-63 ... FROM REF. B 52 (83)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.500	650.00	70.00	653.531 70.380
16.900	810.00	80.00	844.526 83.410
19.400	950.00	90.00	1018.054 96.447

FITTED PARAMETERS

LEVEL SPACING = 4.002 PLUS-OR-MINUS 1.303 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1075.80 PLUS-OR-MINUS 87.54 MB

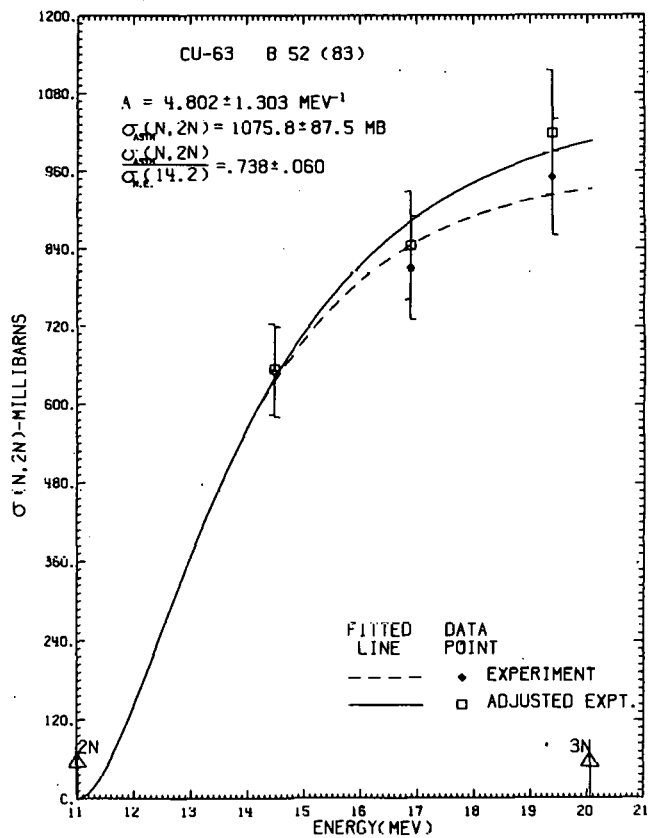
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1457.00 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 20.06 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 29 PROTONS, (MASS = 63)
 NEUTRON EXCESS PARAMETER = .07937

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7384 PLUS-OR-MINUS .0601

N/SPACING = 7.080 A/SPACING = 13.120
 ERROR 1.921 ERROR 3.560



CU-65 ...FROM REF. B 69

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.050	770.00 50.00	770.000 50.000	
13.200	910.00 60.00	810.000 60.000	
14.100	910.00 65.00	910.000 65.000	
15.450	960.00 70.00	980.090 71.465	
16.000	965.00 70.00	993.167 72.043	
16.500	980.00 65.00	1015.517 67.356	
17.050	985.00 65.00	1027.875 67.829	
17.450	1010.00 75.00	1059.018 78.640	
18.000	1055.00 75.00	1113.059 79.127	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.161 PLUS-OR-MINUS .044 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1058.18 PLUS-OR-MINUS 14.69 MB

RELATED DATA

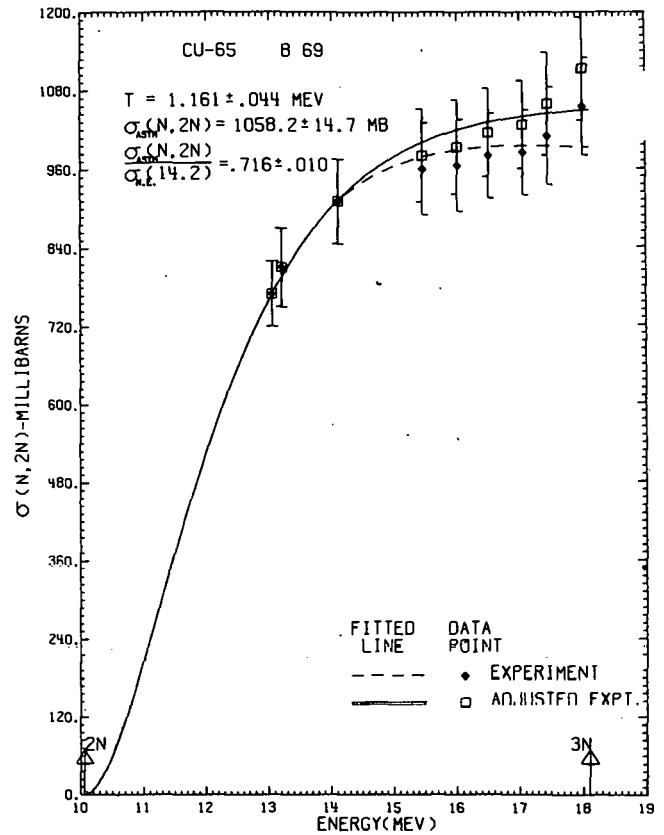
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV

THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)

NEUTRON EXCESS PARAMETER = .1076V

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7161 PLUS-OR-MINUS .0099

T*COEFF(1) = 6.966 ERROR .264 T*COEFF(2) = 0.349 ERROR .1355



CU-65 ...FROM REF. B 69

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.050	770.00 50.00	770.000 50.000	
13.200	910.00 60.00	810.000 60.000	
14.100	910.00 65.00	910.000 65.000	
15.450	960.00 70.00	980.090 71.465	
16.000	965.00 70.00	993.167 72.043	
16.500	980.00 65.00	1015.517 67.356	
17.050	985.00 65.00	1027.875 67.829	
17.450	1010.00 75.00	1059.018 78.640	
18.000	1055.00 75.00	1113.059 79.127	

FITTED PARAMETERS

LEVEL SPACING = 9.186 PLUS-OR-MINUS .661 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1081.99 PLUS-OR-MINUS 15.76 MB

RELATED DATA

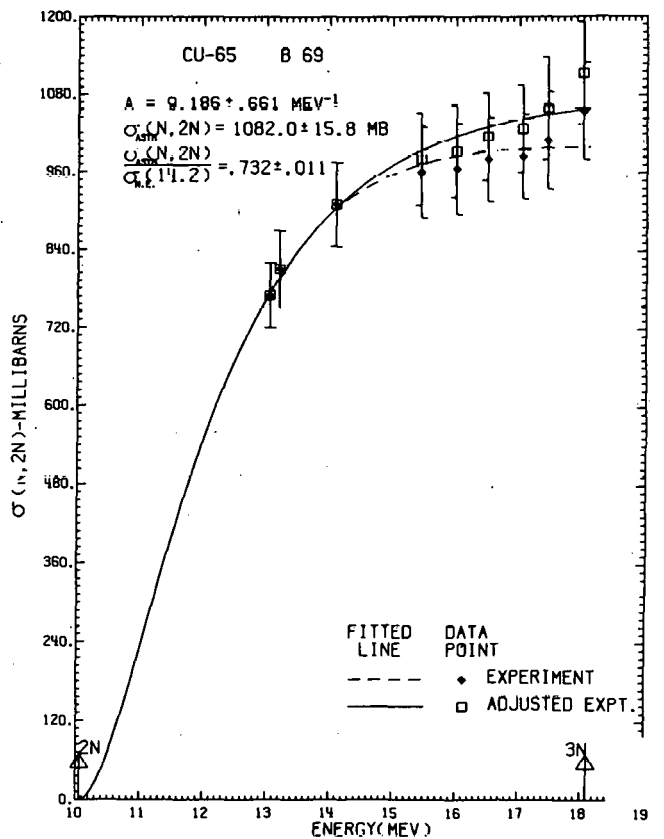
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV

THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)

NEUTRON EXCESS PARAMETER = .1076V

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7322 PLUS-OR-MINUS .0107

N/SPACING = 3.919 ERROR .282 A/SPACING = 7.076 ERROR .509



CU-65 ...FROM REF. C 69

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.400	939.00 150.00	942.345	150.534
15.700	951.00 150.00	974.537	153.712
16.700	950.00 150.00	986.999	155.842

FITTED PARAMETERS

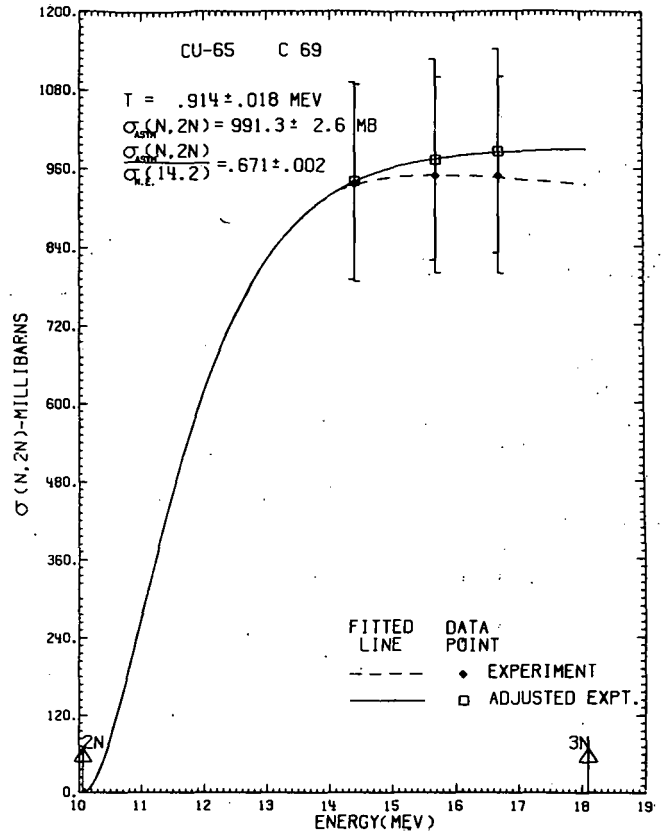
NUCLEAR TEMP. = .914 PLUS-OR-MINUS .018 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 991.32 PLUS-OR-MINUS 2.58 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV

THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)
 NEUTRON EXCESS PARAMETER = .10769
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .6708 PLUS-OR-MINUS .0017

T*SQRT(N) = 5.484 ERROR .108 T*SQRT(A) = 7.369 ERROR .145



CU-65 ...FROM REF. C 69

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.400	939.00 150.00	942.345	150.534
15.700	951.00 150.00	974.537	153.712
16.700	950.00 150.00	986.999	155.842

FITTED PARAMETERS

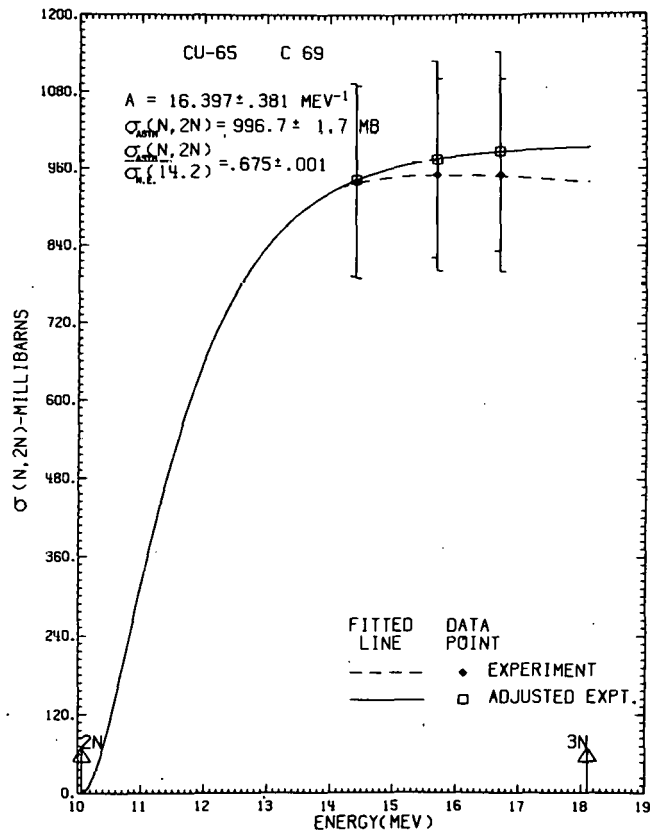
LEVEL SPACING = 16.397 PLUS-OR-MINUS .381 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 996.74 PLUS-OR-MINUS 1.68 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV

THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)
 NEUTRON EXCESS PARAMETER = .10769
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .6745 PLUS-OR-MINUS .0011

N/SPACING = 2.196 ERROR .051 A/SPACING = 3.964 ERROR .092

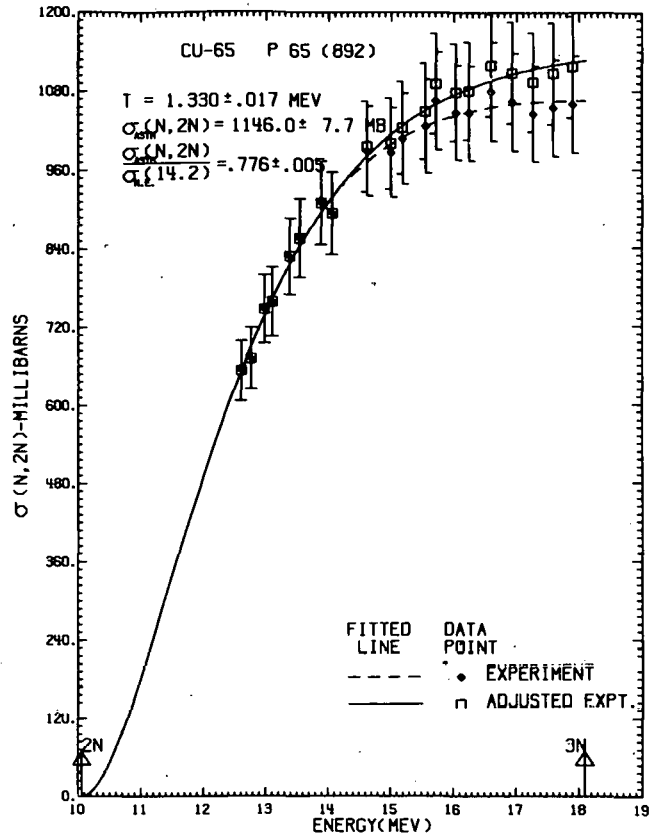


CU-65 ...FROM REF, P 65 (892)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.600	653.00 46.00	653.0000	46.0000
12.760	672.00 47.00	672.0000	47.0000
12.980	747.00 52.00	747.0000	52.0000
13.100	758.00 53.00	758.0000	53.0000
13.380	827.00 58.00	827.0000	58.0000
13.540	855.00 60.00	855.0000	60.0000
13.880	909.00 64.00	909.0000	64.0000
14.050	893.00 63.00	893.0000	63.0000
14.610	988.00 69.00	995.126	69.498
14.990	986.00 69.00	999.397	69.938
15.180	1007.00 70.00	1023.785	71.167
15.550	1026.00 72.00	1049.054	73.618
15.710	1065.00 75.00	1091.518	76.867
16.030	1047.00 73.00	1078.016	75.163
16.240	1046.00 73.00	1080.127	75.382
16.590	1079.00 76.00	1119.427	76.847
16.930	1063.00 75.00	1107.623	78.148
17.270	1045.00 73.00	1093.394	76.381
17.590	1054.00 74.00	1106.941	77.717
17.900	1060.00 74.00	1117.116	77.987

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.330 PLUS-OR-MINUS .017 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1146.05 PLUS-OR-MINUS 7.67 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV
 THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)
 NEUTRON EXCESS PARAMETER = .10769
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7755 PLUS-OR-MINUS .0052
 T-SORT(N) = 7.980 T-SORT(A) = 10.723
 ERROR .102 ERROR .137

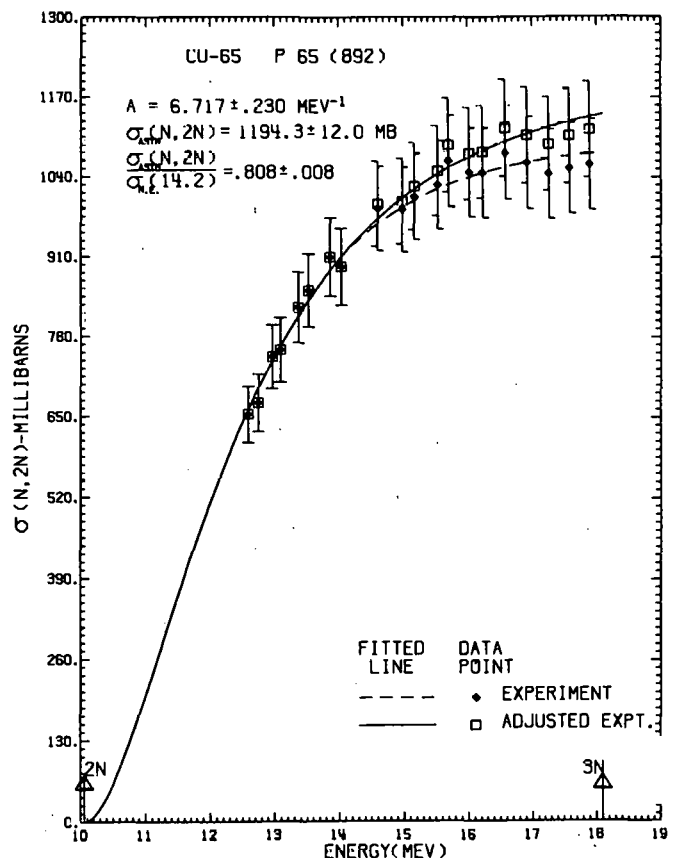


CU-65 ...FROM REF, P 65 (892)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.600	653.00 46.00	653.0000	46.0000
12.760	672.00 47.00	672.0000	47.0000
12.980	747.00 52.00	747.0000	52.0000
13.100	758.00 53.00	758.0000	53.0000
13.380	827.00 58.00	827.0000	58.0000
13.540	855.00 60.00	855.0000	60.0000
13.880	909.00 64.00	909.0000	64.0000
14.050	893.00 63.00	893.0000	63.0000
14.610	988.00 69.00	995.126	69.498
14.990	986.00 69.00	999.397	69.938
15.180	1007.00 70.00	1023.785	71.167
15.550	1026.00 72.00	1049.054	73.618
15.710	1065.00 75.00	1091.518	76.867
16.030	1047.00 73.00	1078.016	75.163
16.240	1046.00 73.00	1080.127	75.382
16.590	1079.00 76.00	1119.427	76.847
16.930	1063.00 75.00	1107.623	78.148
17.270	1045.00 73.00	1093.394	76.381
17.590	1054.00 74.00	1106.941	77.717
17.900	1060.00 74.00	1117.116	77.987

FITTED PARAMETERS
 LEVEL SPACING = 6.717 PLUS-OR-MINUS .230 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1194.28 PLUS-OR-MINUS 11.95 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV
 THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)
 NEUTRON EXCESS PARAMETER = .10769
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8082 PLUS-OR-MINUS .0081
 N/SPACING = 5.360 A/SPACING = 9.677
 ERROR .184 ERROR .331

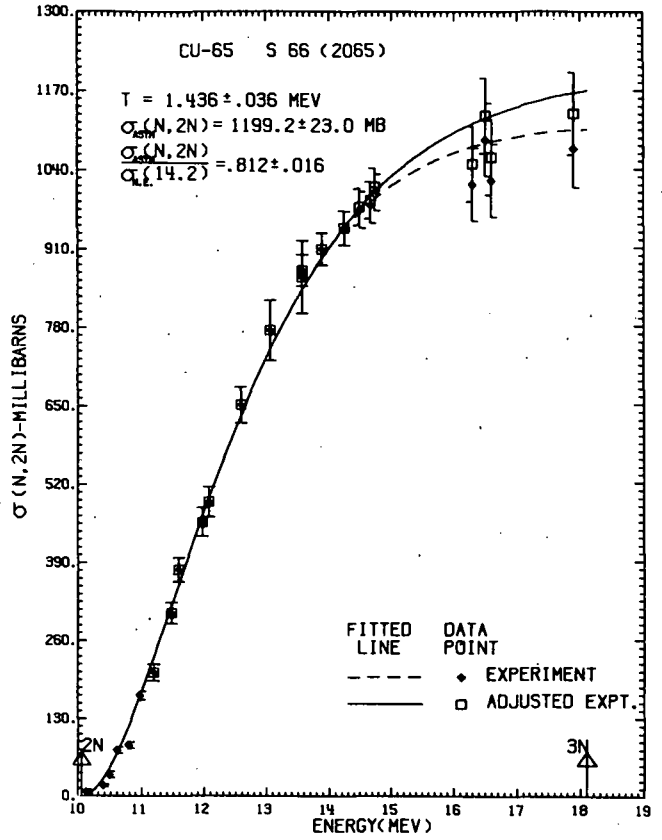


CU-65 FROM REF. S 66 (2065)

ENERGY (EV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
11.220	206.00 14.00	206.000 14.000
11.500	305.00 18.00	305.000 18.000
11.610	377.00 20.00	377.000 20.000
12.000	456.00 24.00	456.000 24.000
12.100	490.00 25.00	490.000 25.000
12.600	651.00 30.00	651.000 30.000
13.080	775.00 50.00	775.000 50.000
13.580	863.00 60.00	863.000 60.000
13.580	874.00 26.00	874.000 26.000
13.890	909.00 27.00	909.000 27.000
14.250	943.00 28.00	943.847 28.025
14.500	973.00 30.00	978.168 30.159
14.680	981.00 30.00	989.249 30.252
14.740	1002.00 30.00	1011.445 30.283
16.300	1015.00 60.00	1048.973 62.008
16.500	1089.00 60.00	1128.467 62.174
16.600	1022.00 60.00	1060.430 62.256
17.900	1074.00 65.00	1131.870 68.502

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.436 PLUS-OR-MINUS .036 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1199.19 PLUS-OR-MINUS 23.04 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV
 THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)
 NEUTRON EXCESS PARAMETER = .10769
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8115 PLUS-OR-MINUS .0156
 T*SQRT(N) = 8.616 T*SQRT(A) = 11.577
 ERROR .216 ERROR .290

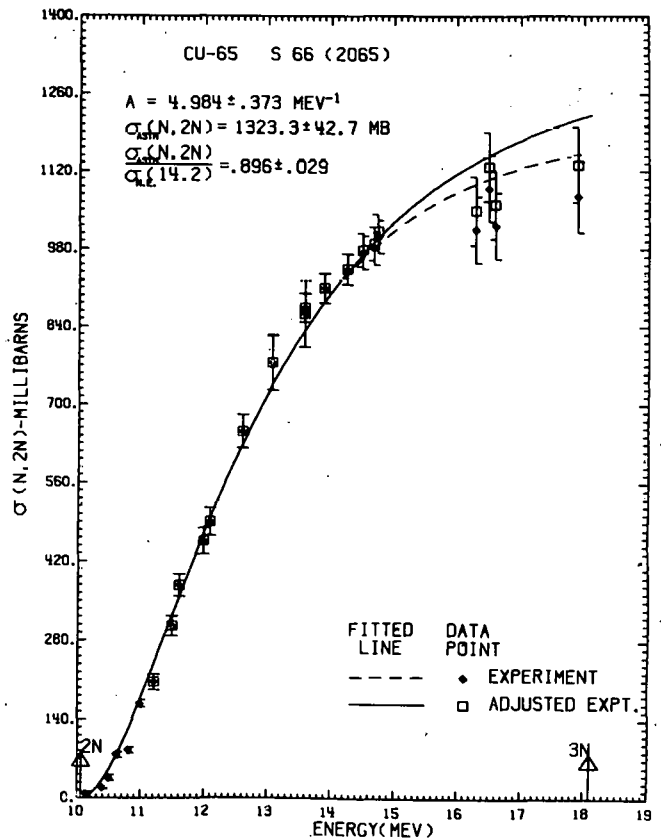


CU-65 FROM REF. S 66 (2065)

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
11.220	206.00 14.00	206.000 14.000
11.500	305.00 18.00	305.000 18.000
11.610	377.00 20.00	377.000 20.000
12.000	456.00 24.00	456.000 24.000
12.100	490.00 25.00	490.000 25.000
12.600	651.00 30.00	651.000 30.000
13.080	775.00 50.00	775.000 50.000
13.580	863.00 60.00	863.000 60.000
13.580	874.00 26.00	874.000 26.000
13.890	909.00 27.00	909.000 27.000
14.250	943.00 28.00	943.847 28.025
14.500	973.00 30.00	978.168 30.159
14.680	981.00 30.00	989.249 30.252
14.740	1002.00 30.00	1011.445 30.283
16.300	1015.00 60.00	1048.973 62.008
16.500	1089.00 60.00	1128.467 62.174
16.600	1022.00 60.00	1060.430 62.256
17.900	1074.00 65.00	1131.870 68.502

FITTED PARAMETERS
 LEVEL SPACING = 4.984 PLUS-OR-MINUS .373 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1323.32 PLUS-OR-MINUS 42.67 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV
 THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)
 NEUTRON EXCESS PARAMETER = .10769
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8955 PLUS-OR-MINUS .0289
 CING = 7.223 A/SPECING = 13.042
 ERROR .541 ERROR .976

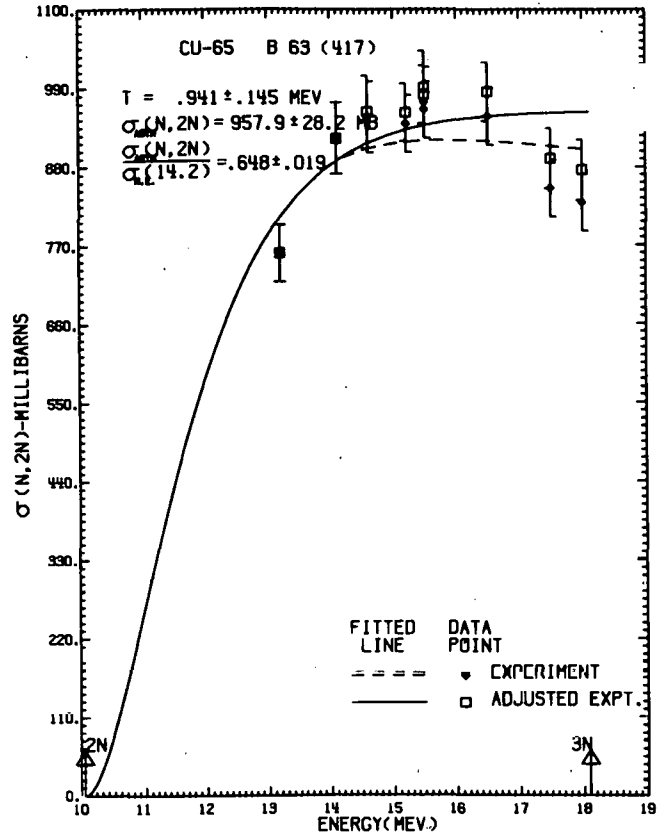


CU-65 ... FROM REF. B 63 (417)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.200	760.00	40.00	760.000	40.000
14.100	920.00	50.00	920.000	50.000
14.600	950.00	50.00	956.688	50.352
15.200	940.00	40.00	955.969	40.680
15.500	960.00	40.00	980.832	40.868
15.500	970.00	50.00	991.049	51.085
16.500	950.00	40.00	984.429	41.450
17.500	850.00	40.00	891.770	41.966
18.000	830.00	40.00	875.677	42.201

FITTED PARAMETERS
 NUCLEAR TEMP. = .941 PLUS-OR-MINUS .145 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 957.93 PLUS-OR-MINUS 28.25 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV
 THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)
 NEUTRON EXCESS PARAMETER = .10769
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6482 PLUS-OR-MINUS .0191
 T-SORT(N) = 5.646 ERROR .870 T-SORT(1) = 7.587 ERROR 1.169

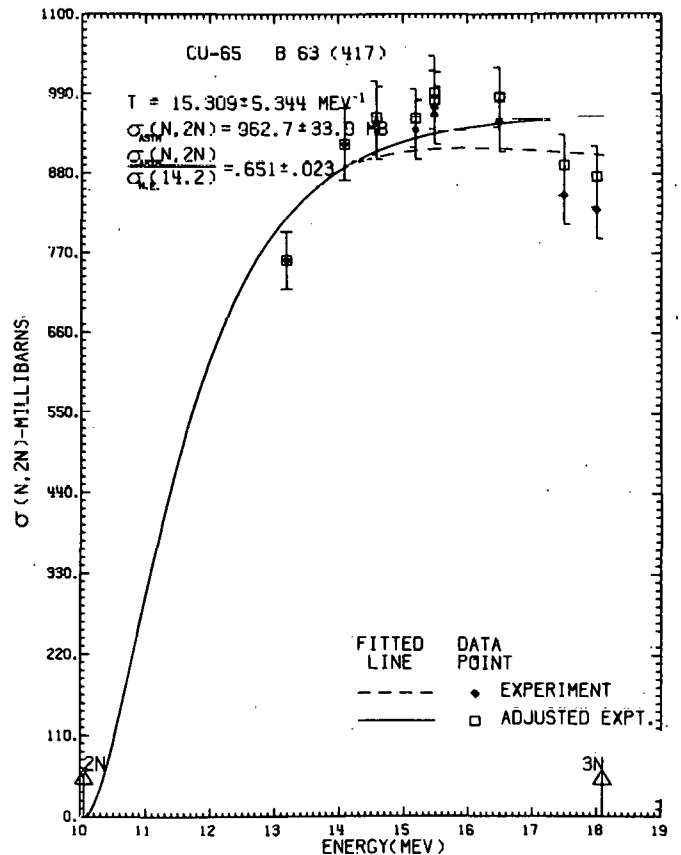


CU-65 ... FROM REF. B 63 (417)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.200	760.00	40.00	760.000	40.000
14.100	920.00	50.00	920.000	50.000
14.600	950.00	50.00	956.688	50.352
15.200	940.00	40.00	955.969	40.680
15.500	960.00	40.00	980.832	40.868
15.500	970.00	50.00	991.049	51.085
16.500	950.00	40.00	984.429	41.450
17.500	850.00	40.00	891.770	41.966
18.000	830.00	40.00	875.677	42.201

FITTED PARAMETERS
 LEVEL SPACING = 15.309 PLUS-OR-MINUS 5.344 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 962.65 PLUS-OR-MINUS 33.89 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV
 THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)
 NEUTRON EXCESS PARAMETER = .10769
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6514 PLUS-OR-MINUS .0229
 N/SPACING = 2.352 ERROR .821 A/SPACING = 4.246 ERROR 1.482

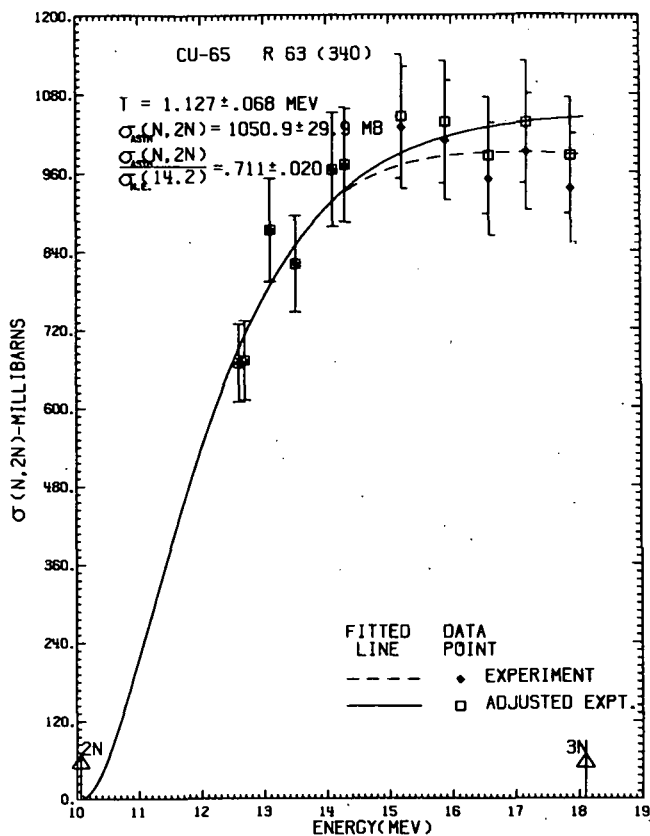


CU-65 ... FROM REF, R 63 (340)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.600	669.00	60.00	669.000 60.000
12.700	673.00	61.00	673.000 61.000
13.100	873.00	79.00	873.000 79.000
13.500	821.00	74.00	821.000 74.000
14.100	965.00	87.00	965.000 87.000
14.300	971.00	87.00	972.740 87.156
15.200	1028.00	93.00	1045.464 94.580
15.900	1009.00	91.00	1036.976 93.523
16.600	950.00	86.00	985.722 89.234
17.200	991.00	89.00	1036.024 93.044
17.900	935.00	84.00	985.380 88.526

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.127 PLUS-OR-MINUS .068 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1050.66 PLUS-OR-MINUS 29.94 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV
 THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)
 NEUTRON EXCESS PARAMETER = .10769
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7111 PLUS-OR-MINUS .0203
 T=SQRT(N) = 6.762 T=SQRT(A) = 9.086
 ERROR .408 ERROR .548

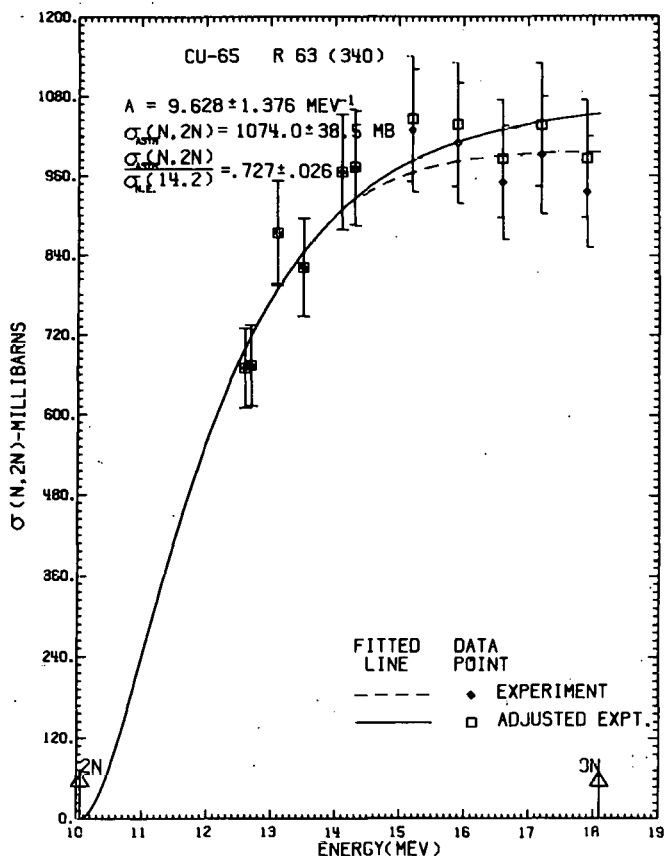


CU-65 ... FROM REF, R 63 (340)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.600	669.00	60.00	669.000 60.000
12.700	673.00	61.00	673.000 61.000
13.100	873.00	79.00	873.000 79.000
13.500	821.00	74.00	821.000 74.000
14.100	965.00	87.00	965.000 87.000
14.300	971.00	87.00	972.740 87.156
15.200	1028.00	93.00	1045.464 94.580
15.900	1009.00	91.00	1036.976 93.523
16.600	950.00	86.00	985.722 89.234
17.200	991.00	89.00	1036.024 93.044
17.900	935.00	84.00	985.380 88.526

FITTED PARAMETERS
 LEVEL SPACING = 9.628 PLUS-OR-MINUS 1.376 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1073.95 PLUS-OR-MINUS 38.52 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV
 THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)
 NEUTRON EXCESS PARAMETER = .10769
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7268 PLUS-OR-MINUS .0261
 N/SPACING = 3.739 A/SPACING = 6.751
 ERROR .534 ERROR .963



CU-65 ... FROM REF, P 61 (588)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.060	504.00	25.00	504.000	25.000
13.330	778.00	31.00	778.000	31.000
13.400	771.00	31.00	771.000	31.000
13.520	814.00	33.00	814.000	33.000
13.690	830.00	33.00	830.000	33.000
13.880	879.00	35.00	879.000	35.000
14.010	879.00	35.00	879.000	35.000
14.090	906.00	36.00	906.000	36.000
14.310	892.00	36.00	893.757	36.071
14.500	937.00	37.00	941.977	37.197
14.680	953.00	38.00	961.013	38.320
14.810	968.00	39.00	978.264	39.414
14.930	975.00	39.00	987.285	39.491
16.500	997.00	50.00	1033.133	51.812
17.950	930.00	47.00	980.647	49.560

FITTED PARAMETERS

NUCLEAR TEMP. = 1.249 PLUS-0M-MINUS .040 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1066.59 PLUS-0R-MINUS 18.35 MB

RELATED DATA

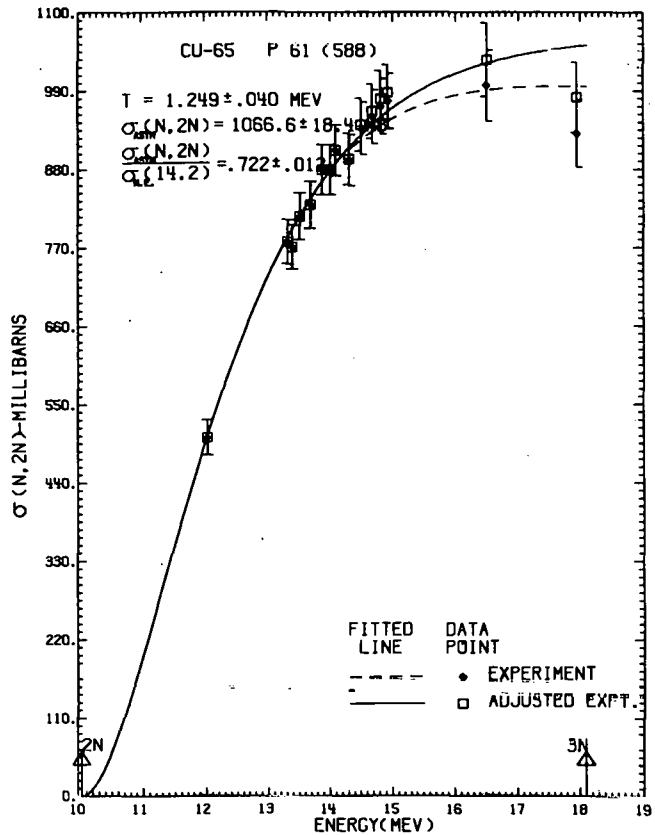
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV

THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)

NEUTRON EXCESS PARAMETER = .10769

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7210 PLUS-0R-MINUS .0124

T-SORT(N) = 7.494 T-SORT(A) = 10.070
 ERROR .240 ERROR .322



CU-65 ... FROM REF, P 61 (588)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.060	504.00	25.00	504.000	25.000
13.330	778.00	31.00	778.000	31.000
13.400	771.00	31.00	771.000	31.000
13.520	814.00	33.00	814.000	33.000
13.690	830.00	33.00	830.000	33.000
13.880	879.00	35.00	879.000	35.000
14.010	879.00	35.00	879.000	35.000
14.090	906.00	36.00	906.000	36.000
14.310	892.00	36.00	893.757	36.071
14.500	937.00	37.00	941.977	37.197
14.680	953.00	38.00	961.013	38.320
14.810	968.00	39.00	978.264	39.414
14.930	975.00	39.00	987.285	39.491
16.500	997.00	50.00	1033.133	51.812
17.950	930.00	47.00	980.647	49.560

FITTED PARAMETERS

LEVEL SPACING = 7.500 PLUS-0R-MINUS .635 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1115.71 PLUS-0R-MINUS 28.57 MB

RELATED DATA

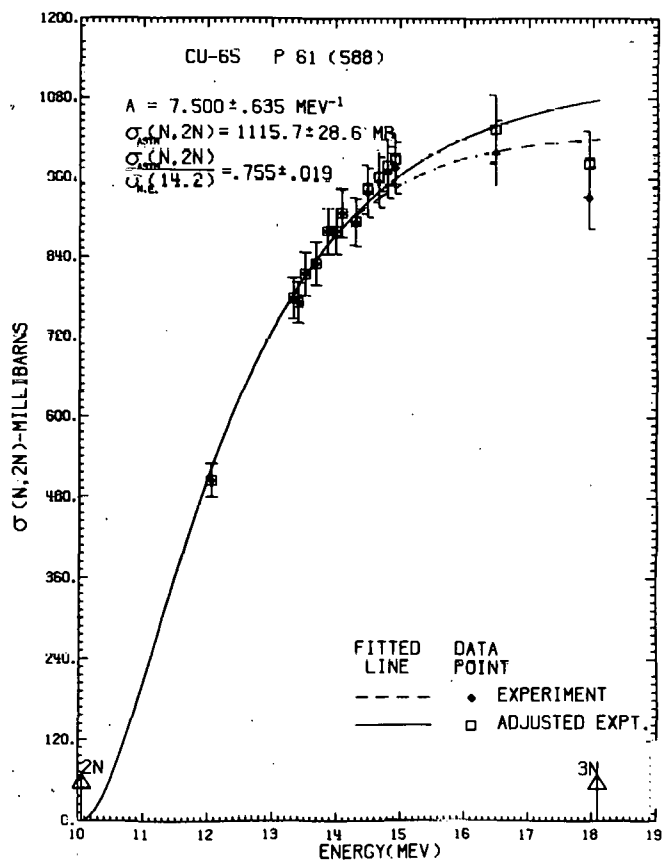
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV

THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)

NEUTRON EXCESS PARAMETER = .10769

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7550 PLUS-0R-MINUS .0193

N/SPACING = 4.800 A/SPACING = 8.667
 ERROR .406 ERROR .734



CU-65 ...FROM REF, P 60 (1720)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
MEASURED, ERR				
13.200	1250.00	130.00	1250.000	130.000
13.600	1350.00	140.00	1350.000	140.000
13.850	1400.00	140.00	1400.000	140.000
14.150	1320.00	130.00	1320.000	130.000
14.400	1480.00	150.00	1485.272	150.534
14.700	1700.00	170.00	1714.872	171.487
14.950	1600.00	160.00	1620.888	162.069
15.350	1750.00	170.00	1783.889	173.292

FITTED PARAMETERS

NUCLEAR TEMP. = 1.591 PLUS-OR-MINUS .265 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2024.35 PLUS-OR-MINUS 231.69 MB

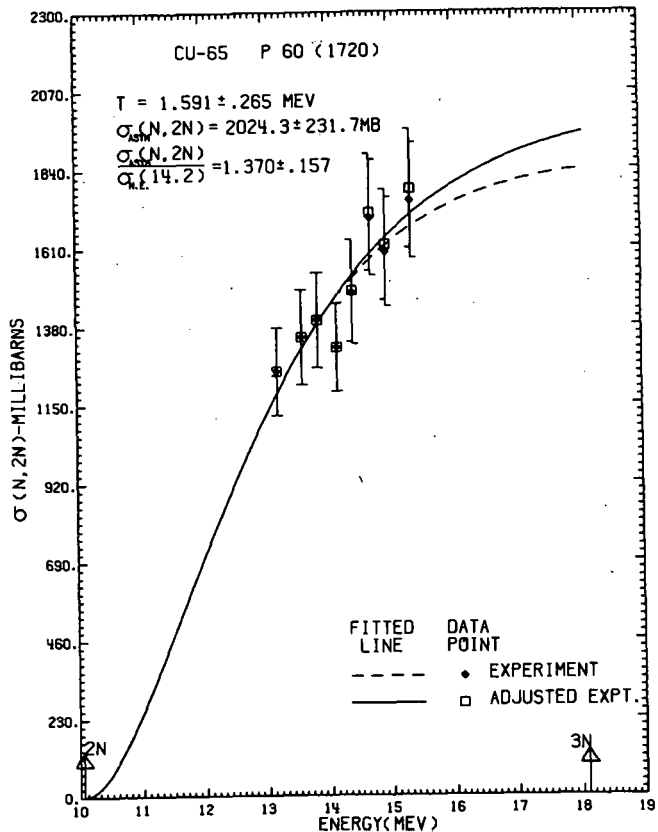
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV

THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)
 NEUTRON EXCESS PARAMETER = .10769

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.3699 PLUS-OR-MINUS .1568

T*SORT(N) = 9.546 T*SORT(A) = 12.827
 ERROR 1.590 ERROR 2.136



CU-65 ...FROM REF, P 60 (1720)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
MEASURED, ERR				
13.200	1250.00	130.00	1250.000	130.000
13.600	1350.00	140.00	1350.000	140.000
13.850	1400.00	140.00	1400.000	140.000
14.150	1320.00	130.00	1320.000	130.000
14.400	1480.00	150.00	1485.272	150.534
14.700	1700.00	170.00	1714.872	171.487
14.950	1600.00	160.00	1620.888	162.069
15.350	1750.00	170.00	1783.889	173.292

FITTED PARAMETERS

LEVEL SPACING = 4.287 PLUS-OR-MINUS 1.653 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2233.04 PLUS-OR-MINUS 345.25 MB

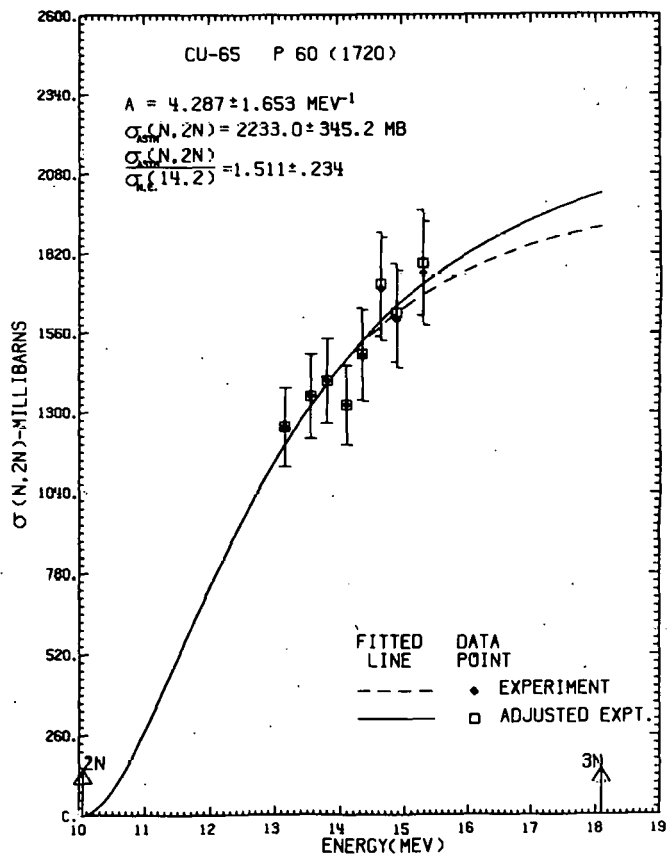
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1477.72 MB
 (N,2N) THRESHOLD = 10.06 MEV
 (N,3N) THRESHOLD = 18.10 MEV

THIS ISOTOPE HAS 36 NEUTRONS, 29 PROTONS, (MASS = 65)
 NEUTRON EXCESS PARAMETER = .10769

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.5111 PLUS-OR-MINUS .2330

N/SPACING = 8.397 A/SPACING = 15.162
 ERROR 3.238 ERROR 5.846

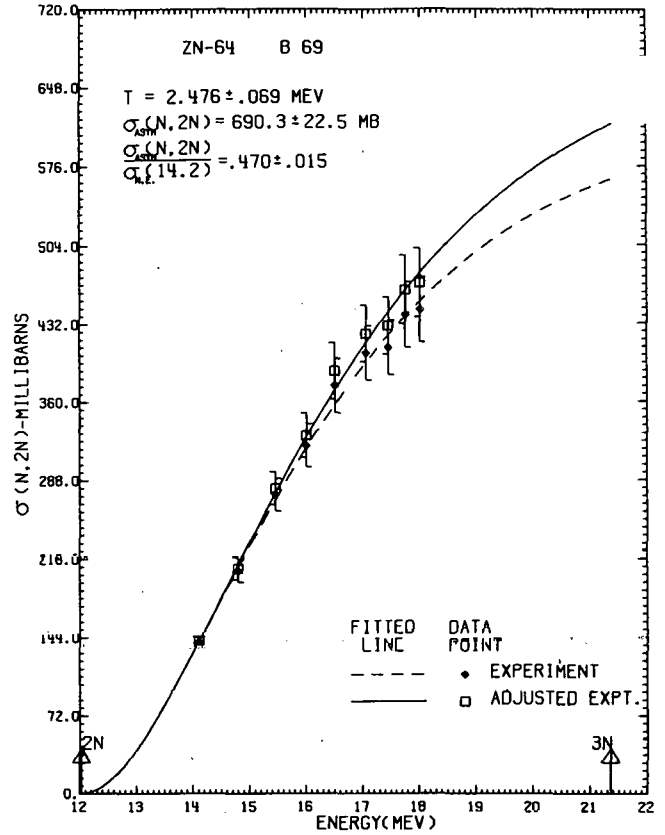


ZN-64 ... FROM REF. B 69

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED	ERR	ADJUSTED	ERR
14.100	140.00	5.00	140.000	5.000
14.800	205.00	10.00	207.164	10.106
15.450	275.00	15.00	280.822	15.318
16.000	320.00	20.00	329.452	20.591
16.500	375.00	25.00	388.756	25.917
17.050	405.00	25.00	422.848	26.102
17.450	410.00	25.00	430.149	26.229
17.750	440.00	30.00	463.229	31.584
18.000	445.00	30.00	469.803	31.672

FITTED PARAMETERS
 NUCLEAR TEMP. = 2.476 PLUS-OR-MINUS .069 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 690.33 PLUS-OR-MINUS 22.50 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1467.41 MB
 (N,2N) THRESHOLD = 12.04 MEV
 (N,3N) THRESHOLD = 21.36 MEV
 THIS ISOTOPE HAS 34 NEUTRONS, 30 PROTONS, (MASS = 64)
 NEUTRON EXCESS PARAMETER = .06250
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4704 PLUS-OR-MINUS .0153
 T(SUM(I)) = 14.43/ ERROR .402 T(SUM(A)) = 19.808 ERROR .552

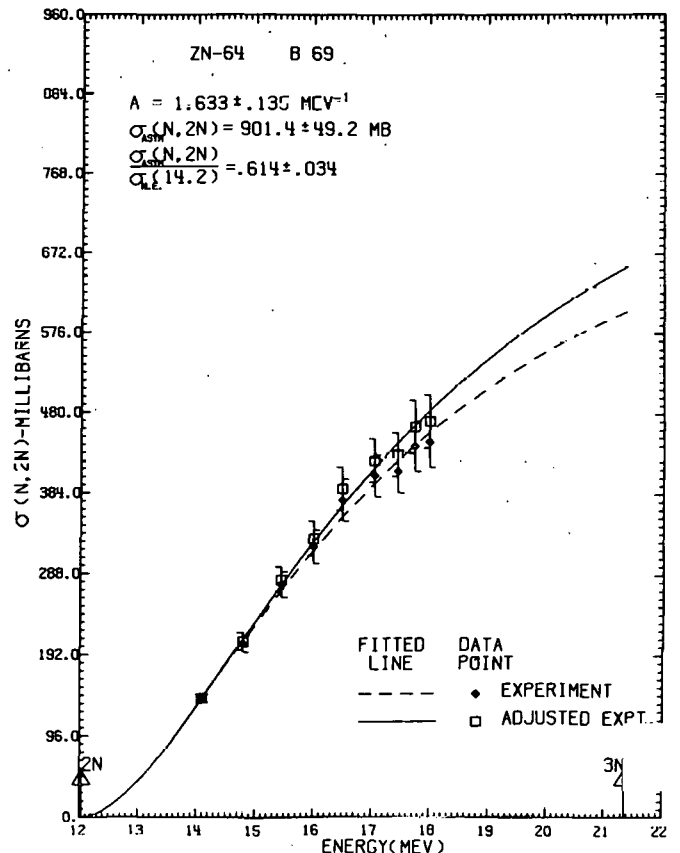


ZN-64 ... FROM REF. B 69

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED	ERR	ADJUSTED	ERR
14.100	140.00	5.00	140.000	5.000
14.800	205.00	10.00	207.164	10.106
15.450	275.00	15.00	280.822	15.318
16.000	320.00	20.00	329.452	20.591
16.500	375.00	25.00	388.756	25.917
17.050	405.00	25.00	422.848	26.102
17.450	410.00	25.00	430.149	26.229
17.750	440.00	30.00	463.229	31.584
18.000	445.00	30.00	469.803	31.672

FITTED PARAMETERS
 LEVEL SPACING = 1.633 PLUS-OR-MINUS .135 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 901.35 PLUS-OR-MINUS 49.17 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1467.41 MB
 (N,2N) THRESHOLD = 12.04 MEV
 (N,3N) THRESHOLD = 21.36 MEV
 THIS ISOTOPE HAS 34 NEUTRONS, 30 PROTONS, (MASS = 64)
 NEUTRON EXCESS PARAMETER = .06250
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6142 PLUS-OR-MINUS .0335
 N/SPACING = 20.821 ERROR 1.721 A/SPACING = 39.192 ERROR 3.240

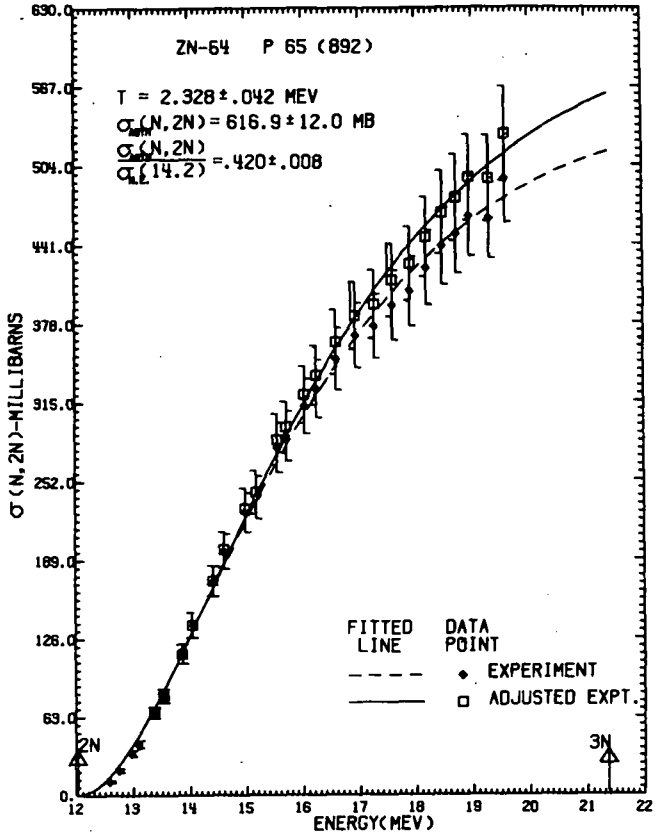


ZN-64 ... FROM REF, P 65 (892)

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
13.380	66.30 4.60	66.300 4.600
13.540	79.80 5.60	79.800 5.600
13.880	114.00 8.00	114.000 8.000
14.050	137.00 10.00	137.000 10.000
14.420	172.00 12.00	172.681 12.047
14.610	196.00 14.00	197.430 14.102
14.990	227.00 16.00	230.120 16.220
15.180	239.00 17.00	243.030 17.287
15.550	279.00 20.00	285.343 20.455
15.710	288.00 20.00	295.256 20.504
16.030	312.00 22.00	321.353 22.660
16.240	326.00 23.00	336.765 23.759
16.590	350.00 25.00	363.274 25.948
16.930	369.00 26.00	384.682 27.105
17.270	376.00 26.00	393.630 27.219
17.590	393.00 28.00	412.989 29.424
17.900	404.00 28.00	426.047 29.528
18.190	423.00 30.00	447.499 31.738
18.470	440.00 31.00	466.857 32.892
18.710	450.00 32.00	478.635 34.036
18.940	464.00 32.00	494.647 34.114
19.290	462.00 32.00	494.154 34.227
19.580	494.00 35.00	529.779 37.535

FITTED PARAMETERS
 NUCLEAR TEMP. = 2.328 PLUS-OR-MINUS .042 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 616.91 PLUS-OR-MINUS 12.03 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1467.41 MB
 (N,2N) THRESHOLD = 12.04 MEV
 (N,3N) THRESHOLD = 21.36 MEV
 THIS ISOTOPE HAS 34 NEUTRONS, 30 PROTONS, (MASS = 64)
 NEUTRON EXCESS PARAMETER = .06250
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4204 PLUS-OR-MINUS .0082
 T*SQRT(N) = 13.574 T*SQRT(A) = 18.624
 ERROR .245 ERROR .336

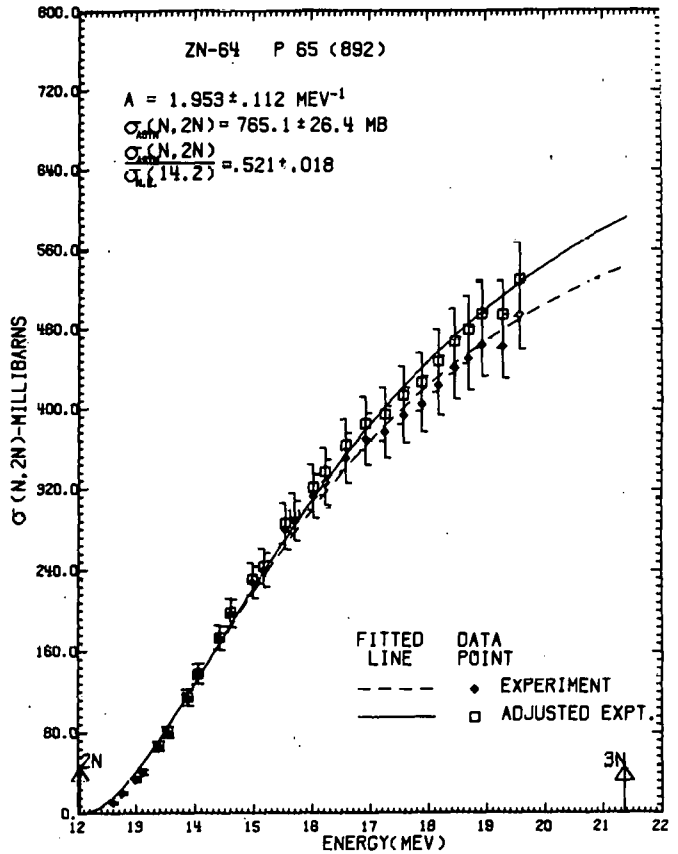


ZN-64 ... FROM REF, P 65 (892)

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
13.380	66.30 4.60	66.300 4.600
13.540	79.80 5.60	79.800 5.600
13.880	114.00 8.00	114.000 8.000
14.050	137.00 10.00	137.000 10.000
14.420	172.00 12.00	172.681 12.047
14.610	196.00 14.00	197.430 14.102
14.990	227.00 16.00	230.120 16.220
15.180	239.00 17.00	243.030 17.287
15.550	279.00 20.00	285.343 20.455
15.710	288.00 20.00	295.256 20.504
16.030	312.00 22.00	321.353 22.660
16.240	326.00 23.00	336.765 23.759
16.590	350.00 25.00	363.274 25.948
16.930	369.00 26.00	384.682 27.105
17.270	376.00 26.00	393.630 27.219
17.590	393.00 28.00	412.989 29.424
17.900	404.00 28.00	426.047 29.528
18.190	423.00 30.00	447.499 31.738
18.470	440.00 31.00	466.857 32.892
18.710	450.00 32.00	478.635 34.036
18.940	464.00 32.00	494.647 34.114
19.290	462.00 32.00	494.154 34.227
19.580	494.00 35.00	529.779 37.535

FITTED PARAMETERS
 LEVEL SPACING = 1.953 PLUS-OR-MINUS .112 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 765.06 PLUS-OR-MINUS 26.45 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1467.41 MB
 (N,2N) THRESHOLD = 12.04 MEV
 (N,3N) THRESHOLD = 21.36 MEV
 THIS ISOTOPE HAS 34 NEUTRONS, 30 PROTONS, (MASS = 64)
 NEUTRON EXCESS PARAMETER = .06250
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5214 PLUS-OR-MINUS .0180
 N/SPACING = 17.409 A/SPACING = 32.770
 ERROR .998 ERROR 1.679

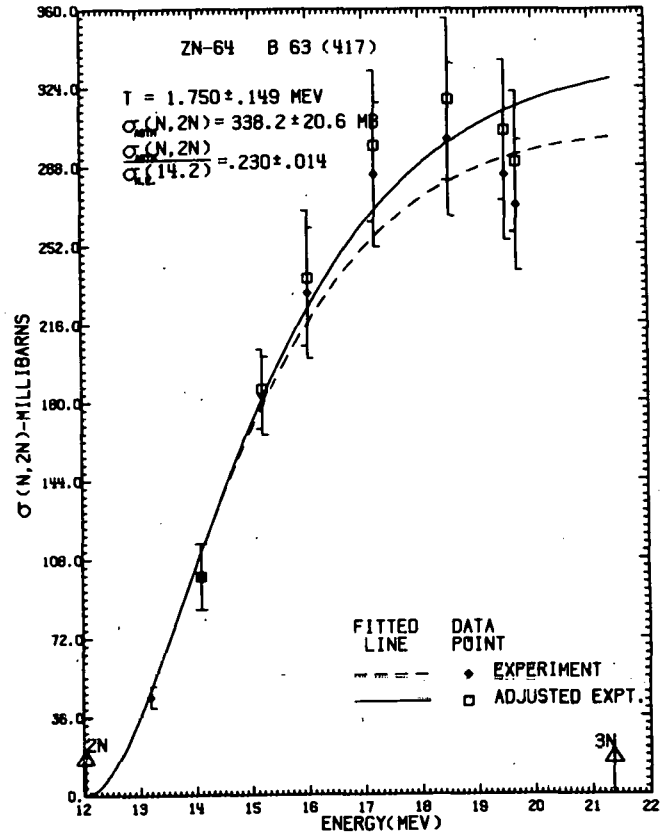


ZN-64 ...FROM REF. B 63 (417)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
14.100	100.00	15.00	100.000	15.000	
15.200	183.00	18.00	186.145	18.309	
16.000	230.00	30.00	236.794	30.886	
17.200	284.00	33.00	297.064	34.518	
18.500	300.00	35.00	318.410	37.148	
19.500	284.00	30.00	304.350	32.150	
19.700	270.00	30.00	289.863	32.207	

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.750 PLUS-OR-MINUS .149 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 336.19 PLUS-OR-MINUS 20.64 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1467.41 MB
 (N,2N) THRESHOLD = 12.04 MEV
 (N,3N) THRESHOLD = 21.36 MEV
 THIS ISOTOPE HAS 34 NEUTRONS, 30 PROTONS, (MASS = 64)
 NEUTRON EXCESS PARAMETER = .06250
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .2305 PLUS-OR-MINUS .0141
 T*SQRT(N) = 10.204 T*SQRT(A) = 14.000
 ERROR .969 ERROR 1.192

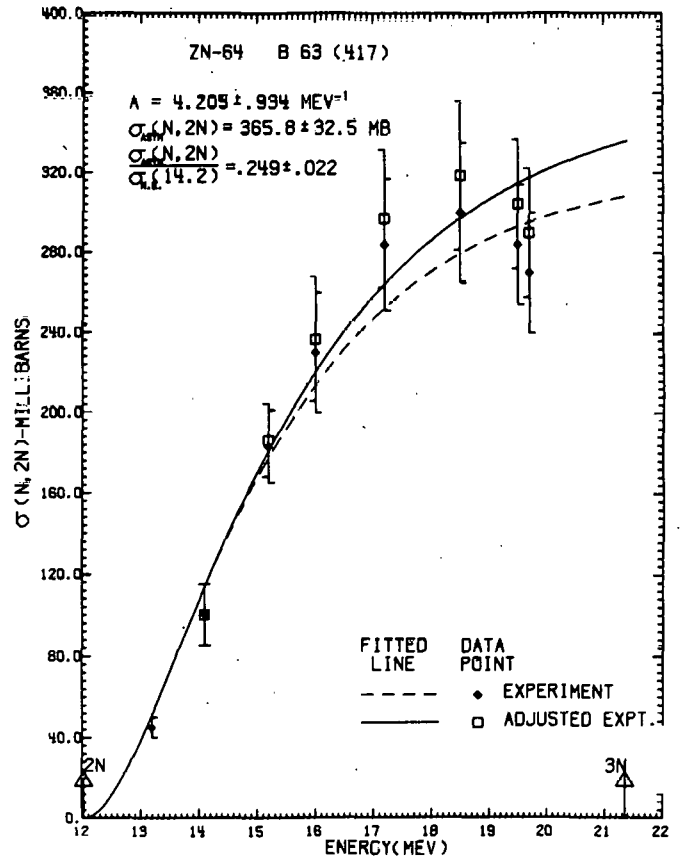


ZN-64 ...FROM REF. B 63 (417)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
14.100	100.00	15.00	100.000	15.000	
15.200	183.00	18.00	186.145	18.309	
16.000	230.00	30.00	236.794	30.886	
17.200	284.00	33.00	297.064	34.518	
18.500	300.00	35.00	318.410	37.148	
19.500	284.00	30.00	304.350	32.150	
19.700	270.00	30.00	289.863	32.207	

FITTED PARAMETERS
 LEVEL SPACING = 4.205 PLUS-OR-MINUS .934 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 365.77 PLUS-OR-MINUS 32.49 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1467.41 MB
 (N,2N) THRESHOLD = 12.04 MEV
 (N,3N) THRESHOLD = 21.36 MEV
 THIS ISOTOPE HAS 34 NEUTRONS, 30 PROTONS, (MASS = 64)
 NEUTRON EXCESS PARAMETER = .06250
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .2493 PLUS-OR-MINUS .0221
 N/SPACING = 8.086 A/SPACING = 15.220
 ERROR 1.796 ERROR 3.381



ZN-64 ...FROM REF. R 63 (2170)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR		
13.470	74.00	7.00	74.000	7.000
15.080	267.00	23.00	269.273	23.638
17.240	325.00	29.00	340.115	30.349
18.410	388.00	35.00	411.427	37.113
19.480	379.00	34.00	406.084	36.430

FITTED PARAMETERS

NUCLEAR TEMP. = 2.045 PLUS-OR-MINUS .002 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 477.99 PLUS-OR-MINUS 17.49 MB

RELATED DATA

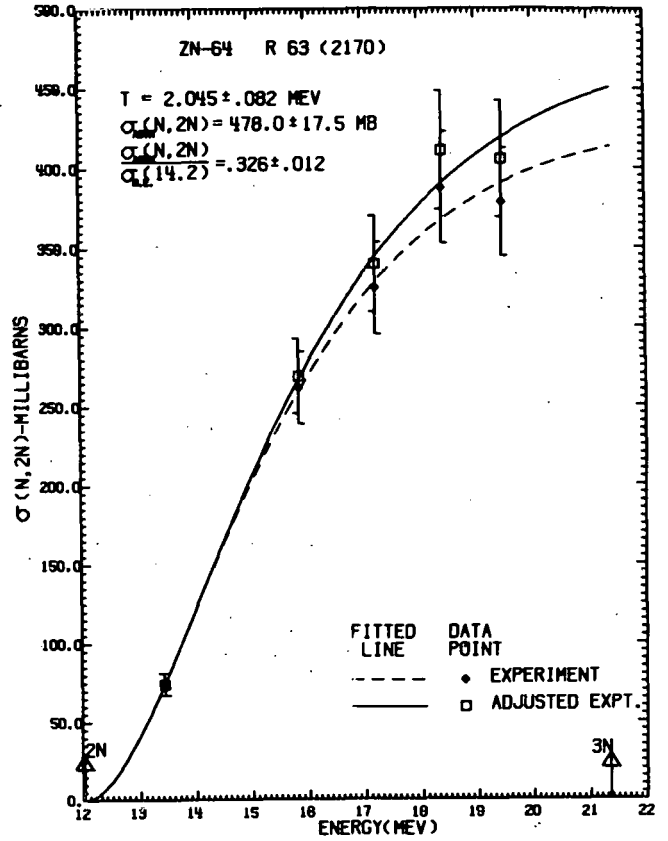
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1467.41 MB
 (N,2N) THRESHOLD = 12.04 MEV
 (N,3N) THRESHOLD = 21.36 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 30 PROTONS, (MASS = 64)

NEUTRON EXCESS PARAMETER = .06250

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .3297 PLUS-OR-MINUS .0119

T*SQRT(A) = 11.924 T*SQRT(A) = 16.360
 ERROR .478 ERROR .656



ZN-64 ...FROM REF. R 63 (2170)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR		
13.470	74.00	7.00	74.000	7.000
15.080	262.00	23.00	269.273	23.638
17.240	325.00	29.00	340.115	30.349
18.410	388.00	35.00	411.427	37.113
19.480	379.00	34.00	406.084	36.430

FITTED PARAMETERS

LEVEL SPACING = 2.686 PLUS-OR-MINUS .322 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 559.93 PLUS-OR-MINUS 34.88 MB

RELATED DATA

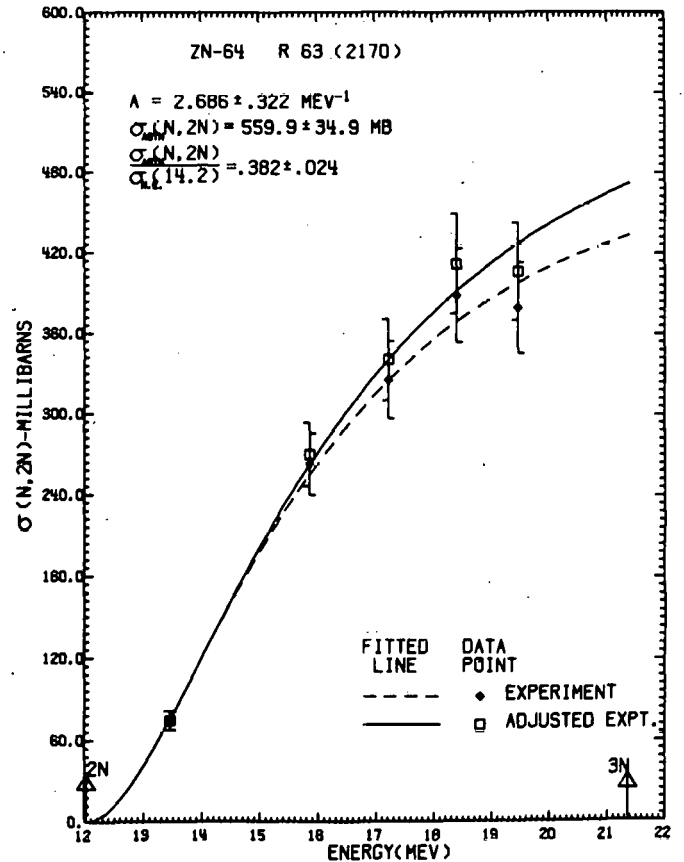
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1467.41 MB
 (N,2N) THRESHOLD = 12.04 MEV
 (N,3N) THRESHOLD = 21.36 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 30 PROTONS, (MASS = 64)

NEUTRON EXCESS PARAMETER = .06250

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .3816 PLUS-OR-MINUS .0230

N/SPACING = 12.658 A/SPACING = 23.827
 ERROR 1.517 ERROR 2.856



ZN-64 ... FROM REF. K 60 (770)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.400	75.00	10.00	75.000	10.000	
13.410	85.00	10.00	85.000	10.000	
14.000	138.00	12.00	138.000	12.000	
14.300	167.00	12.00	167.303	12.022	
15.700	255.00	20.00	261.386	20.501	
16.500	275.00	25.00	285.088	25.917	
16.510	295.00	30.00	305.862	31.105	
17.400	330.00	30.00	346.012	31.456	
18.100	337.00	30.00	356.172	31.707	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.616 PLUS-OR-MINUS .058 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 397.68 PLUS-OR-MINUS 13.72 MB

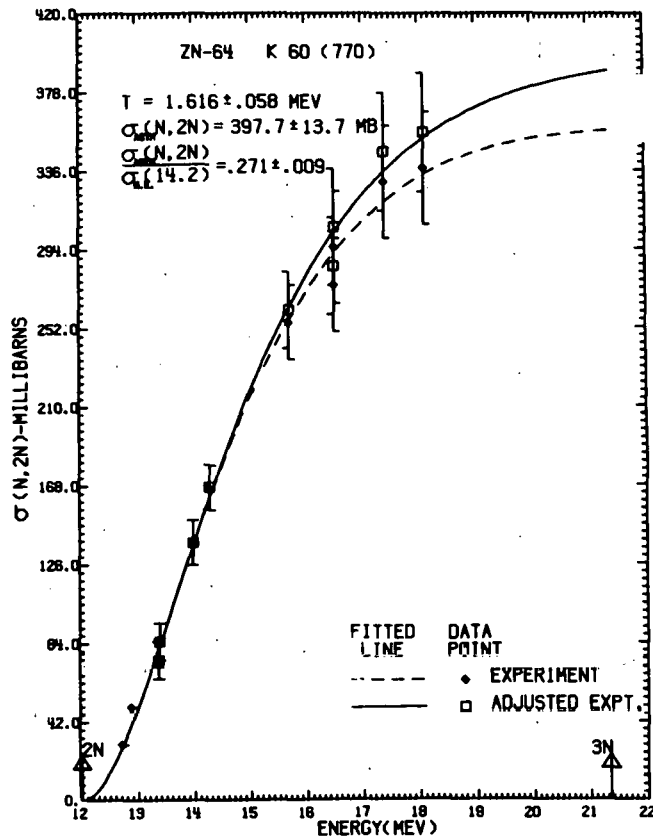
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1467.41 MB
 (N,2N) THRESHOLD = 12.04 MEV
 (N,3N) THRESHOLD = 21.36 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 30 PROTONS, (MASS = 64)
 NEUTRON EXCESS PARAMETER = .06250

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .2710 PLUS-OR-MINUS .0093

T(SQRT(N)) = 9.423 T(SQRT(A)) = 12.078
 ERROR .338 ERROR .464



ZN-64 ... FROM REF. K 60 (770)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.400	75.00	10.00	75.000	10.000	
13.410	85.00	10.00	85.000	10.000	
14.000	138.00	12.00	138.000	12.000	
14.300	167.00	12.00	167.303	12.022	
15.700	255.00	20.00	261.386	20.501	
16.500	275.00	25.00	285.088	25.917	
16.510	295.00	30.00	305.862	31.105	
17.400	330.00	30.00	346.012	31.456	
18.100	337.00	30.00	356.172	31.707	

FITTED PARAMETERS

LEVEL SPACING = 4.469 PLUS-OR-MINUS .386 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 447.14 PLUS-OR-MINUS 20.34 MB

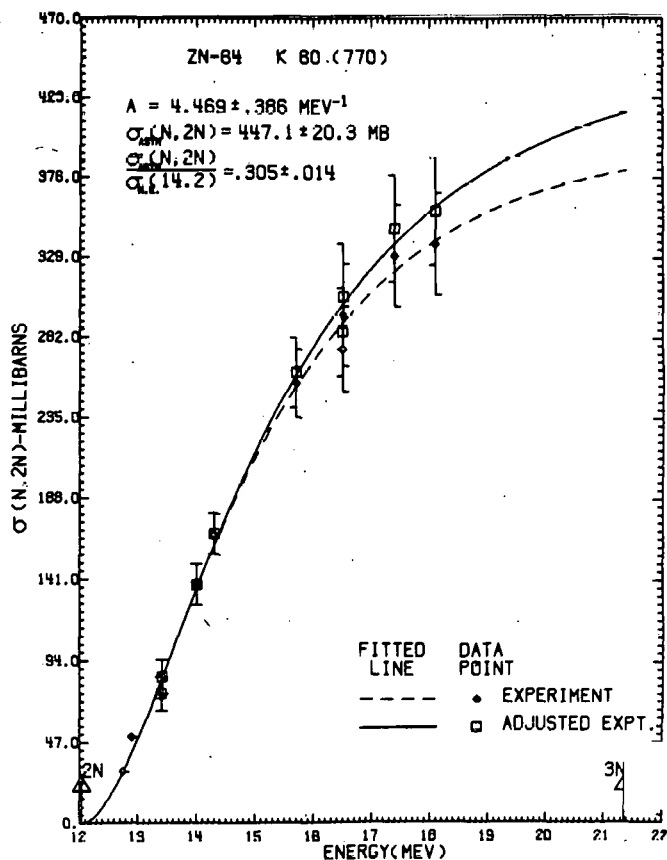
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1467.41 MB
 (N,2N) THRESHOLD = 12.04 MEV
 (N,3N) THRESHOLD = 21.36 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 30 PROTONS, (MASS = 64)
 NEUTRON EXCESS PARAMETER = .06250

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .3047 PLUS-OR-MINUS .0139

N/SPACING = 7.608 A/SPACING = 14.321
 ERROR .657 ERROR 1.237

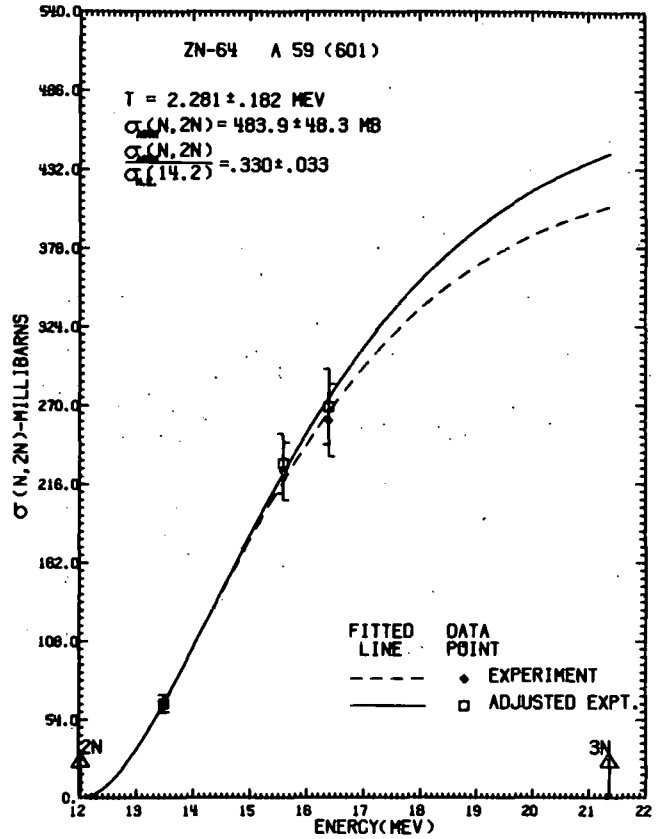


ZN-64 ...FROM REF. A 59 (601)

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
13,500	65.00 6.00	65.000 6.000
15,400	225.00 20.00	230.289 20.470
16,400	260.00 25.00	269.175 25.882

FITTED PARAMETERS
 NUCLEAR TEMP. = 2.281 PLUS-OR-MINUS .182 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 483.89 PLUS-OR-MINUS 48.32 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1467.41 MB
 (N,2N) THRESHOLD = 12.04 MEV
 (N,3N) THRESHOLD = 21.36 MEV
 THIS ISOTOPE HAS 34 NEUTRONS, 30 PROTONS, (MASS = 64)
 NEUTRON EXCESS PARAMETER = .06250
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .3298 PLUS-OR-MINUS .0329
 T*SQRT(N) = 13.300 T*SQRT(A) = 18.248
 ERROR 1.061 ERROR 1.456

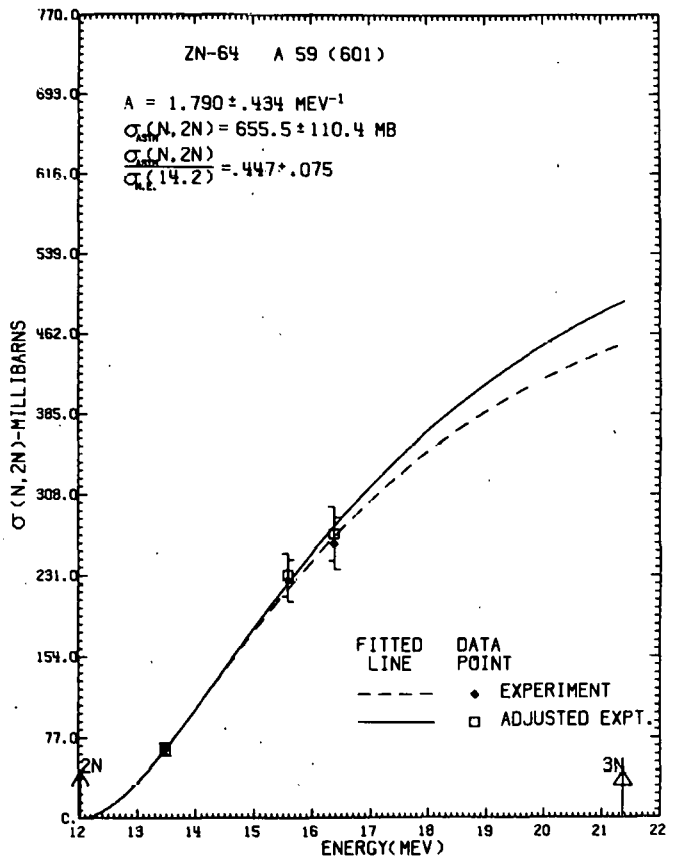


ZN-64 ...FROM REF. A 59 (601)

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
13,500	65.00 6.00	65.000 6.000
15,600	225.00 20.00	230.289 20.470
16,400	260.00 25.00	269.175 25.882

FITTED PARAMETERS
 LEVEL SPACING = 1.790 PLUS-OR-MINUS .434 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 655.55 PLUS-OR-MINUS 110.40 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1467.41 MB
 (N,2N) THRESHOLD = 12.04 MEV
 (N,3N) THRESHOLD = 21.36 MEV
 THIS ISOTOPE HAS 34 NEUTRONS, 30 PROTONS, (MASS = 64)
 NEUTRON EXCESS PARAMETER = .06250
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4467 PLUS-OR-MINUS .0752
 N/SPACING = 18.994 A/SPACING = 35.754
 ERROR 4.605 ERROR 8.669



ZN-64 ... FROM REF. C 56 (36)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13,900	175.00	25.00	175.000 25.000
13,910	210.00	15.00	210.000 15.000
14,000	160.00	25.00	160.000 25.000
14,450	280.00	25.00	281.257 25.112
14,600	270.00	25.00	271.922 25.178
14,900	300.00	20.00	303.673 20.245
15,000	270.00	20.00	273.756 20.278
15,400	285.00	20.00	290.809 20.408
15,900	440.00	40.00	452.345 41.122
16,000	340.00	20.00	350.043 20.591
16,650	360.00	35.00	373.948 36.356
16,700	450.00	.00	467.741 1.000
17,500	520.00	60.00	545.876 62.986

FITTED PARAMETERS

NUCLEAR TEMP. = 1.913 PLUS-OR-MINUS .228 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 668.49 PLUS-OR-MINUS 59.52 MB

RELATED DATA

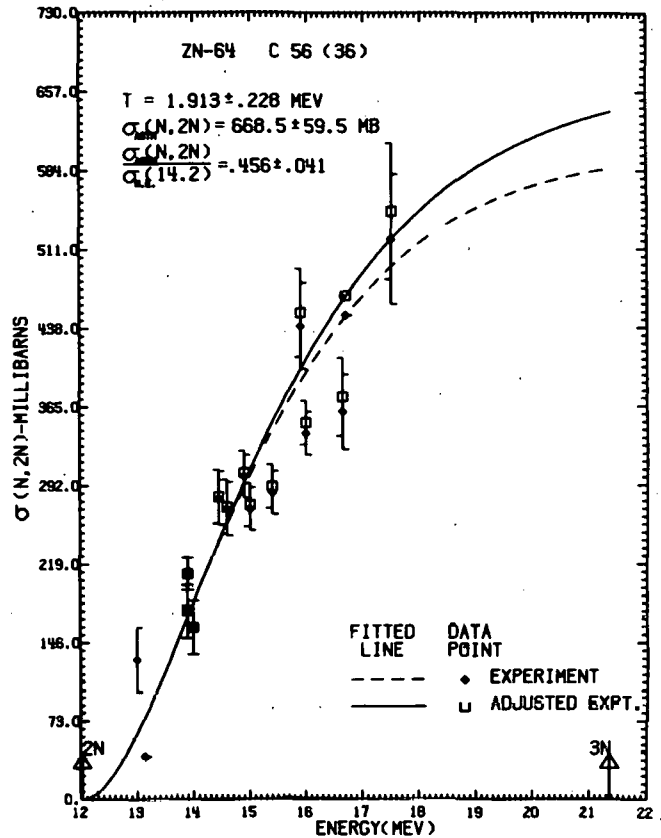
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1467.41 MB
 (N,2N) THRESHOLD = 12.04 MEV
 (N,3N) THRESHOLD = 21.36 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 30 PROTONS, (MASS = 64)

NEUTRON EXCESS PARAMETER = .06250

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4556 PLUS-OR-MINUS .0406

T*SQRT(N) = 11.155 T*SQRT(A) = 15.304
 ERROR 1.329 ERROR 1.824



ZN-64 ... FROM REF. C 56 (36)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13,900	175.00	25.00	175.000 25.000
13,910	210.00	15.00	210.000 15.000
14,000	160.00	25.00	160.000 25.000
14,450	280.00	25.00	281.257 25.112
14,600	270.00	25.00	271.922 25.178
14,900	300.00	20.00	303.673 20.245
15,000	270.00	20.00	273.756 20.278
15,400	285.00	20.00	290.809 20.408
15,900	440.00	40.00	452.345 41.122
16,000	340.00	20.00	350.043 20.591
16,650	360.00	35.00	373.948 36.356
16,700	450.00	.00	467.741 1.000
17,500	520.00	60.00	545.876 62.986

FITTED PARAMETERS

LEVEL SPACING = 3.085 PLUS-OR-MINUS .872 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 786.05 PLUS-OR-MINUS 101.32 MB

RELATED DATA

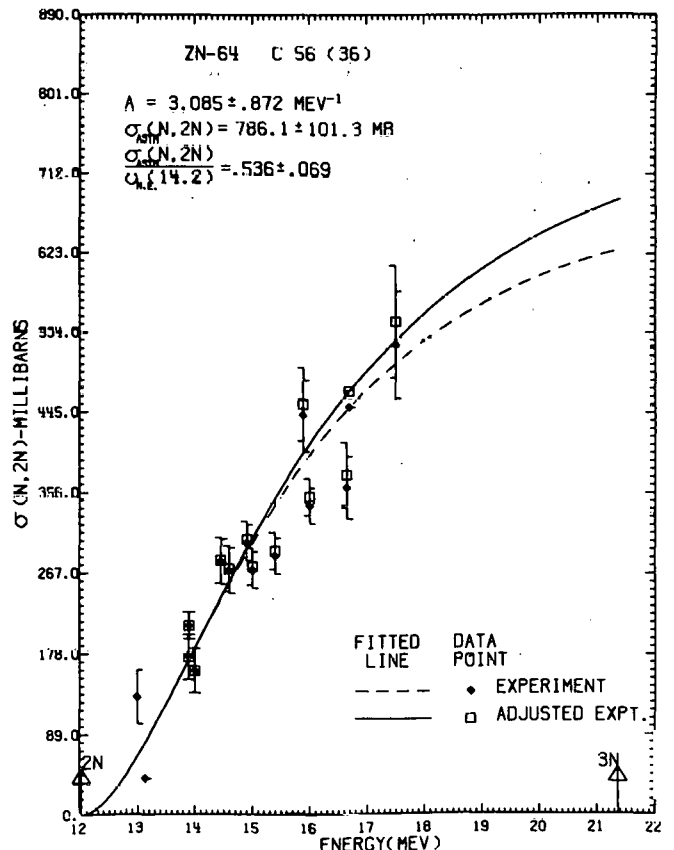
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1467.41 MB
 (N,2N) THRESHOLD = 12.04 MEV
 (N,3N) THRESHOLD = 21.36 MEV

THIS ISOTOPE HAS 34 NEUTRONS, 30 PROTONS, (MASS = 64)

NEUTRON EXCESS PARAMETER = .06250

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5357 PLUS-OR-MINUS .0690

N/SPACING = 11.021 A/SPACING = 20.746
 ERROR 3.115 ERROR 5.864



ZN-66 ... FROM REF. B 69

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.100	760.00	55.00	760.000 55.000
14.800	875.00	60.00	884.029 60.619
15.450	970.00	70.00	990.065 71.448
16.000	975.00	70.00	1003.124 72.019
16.500	1040.00	70.00	1077.240 72.507
17.050	1095.00	80.00	1142.082 83.440
17.450	1095.00	80.00	1147.486 83.835
17.750	1135.00	80.00	1193.431 84.118
18.000	1145.00	80.00	1207.219 84.347

FITTED PARAMETERS

NUCLEAR TEMP. = 1.427 PLUS-OR-MINUS .052 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1239.85 PLUS-OR-MINUS 22.70 MB

RELATED DATA

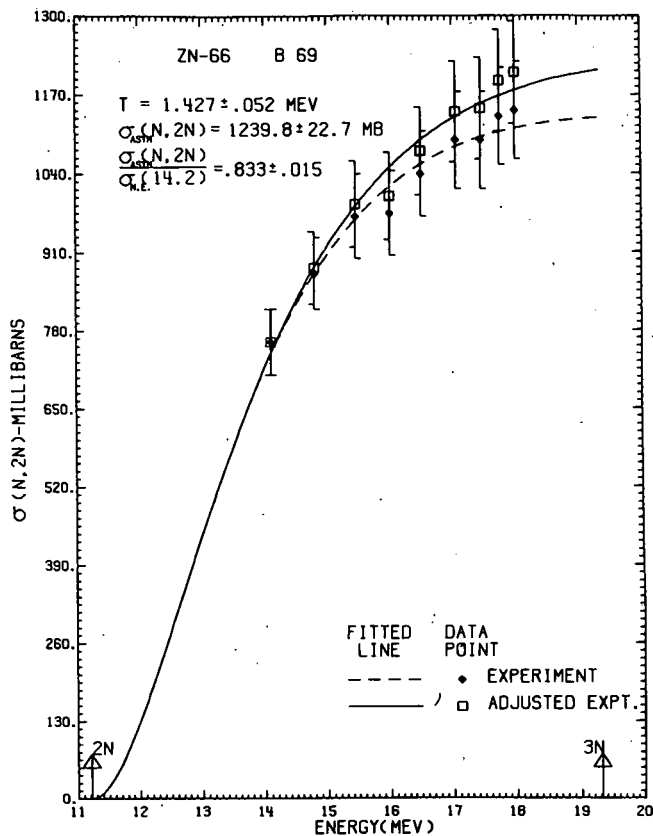
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1487.95 MB
 (N,2N) THRESHOLD = 11.22 MEV
 (N,3N) THRESHOLD = 19.32 MEV

THIS ISOTOPE HAS 36 NEUTRONS, 30 PROTONS, (MASS = 66)

NEUTRON EXCESS PARAMETER = .09091

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8333 PLUS-OR-MINUS .0153

T*SORT(N) = 8.562 ERROR .312
 T*SORT(A) = 11.593 ERROR .422



ZN-66 ... FROM REF. B 69

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.100	760.00	55.00	760.000 55.000
14.800	875.00	60.00	884.029 60.619
15.450	970.00	70.00	990.065 71.448
16.000	975.00	70.00	1003.124 72.019
16.500	1040.00	70.00	1077.240 72.507
17.050	1095.00	80.00	1142.082 83.440
17.450	1095.00	80.00	1147.486 83.835
17.750	1135.00	80.00	1193.431 84.118
18.000	1145.00	80.00	1207.219 84.347

FITTED PARAMETERS

LEVEL SPACING = 6.326 PLUS-OR-MINUS .434 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1303.11 PLUS-OR-MINUS 25.72 MB

RELATED DATA

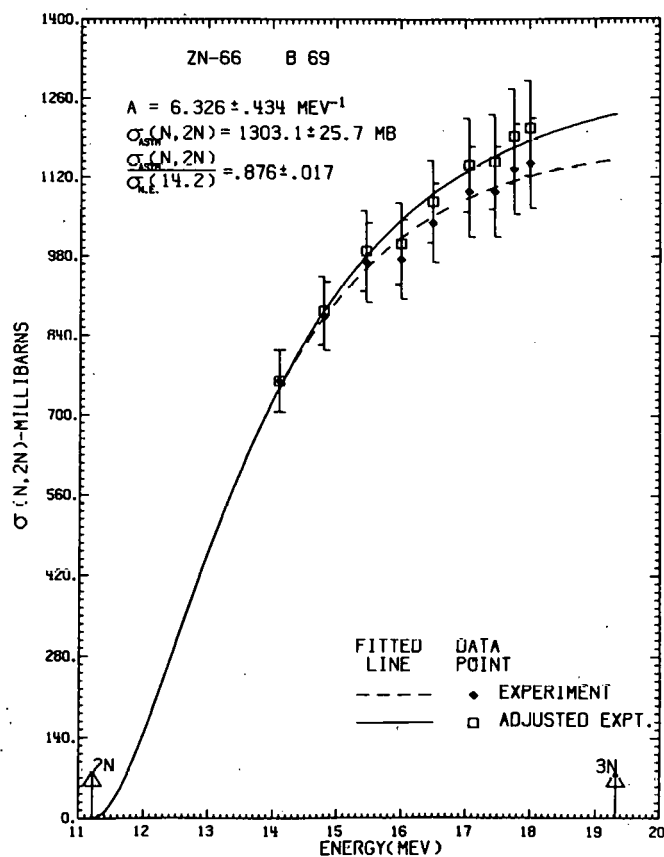
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1487.95 MB
 (N,2N) THRESHOLD = 11.22 MEV
 (N,3N) THRESHOLD = 19.32 MEV

THIS ISOTOPE HAS 36 NEUTRONS, 30 PROTONS, (MASS = 66)

NEUTRON EXCESS PARAMETER = .09091

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8758 PLUS-OR-MINUS .0173

N/SPACING = 5.691 ERROR .390
 A/SPACING = 10.433 ERROR .716



GA-69 ... FROM REF. B 65 (843)

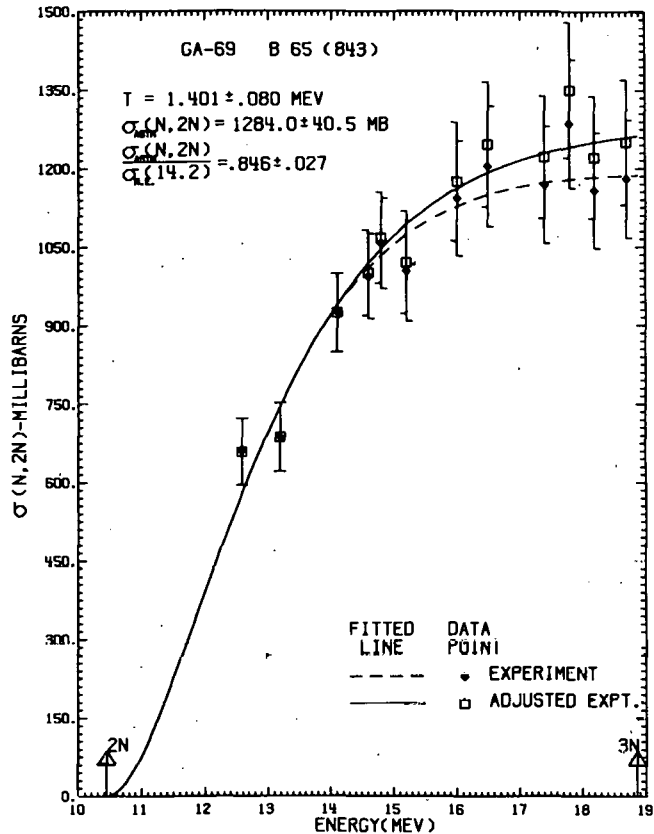
ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
12.600	660.00 64.00	660.000 64.000
13.200	688.00 66.00	688.000 66.000
14.100	925.00 75.00	925.000 75.000
14.600	994.00 81.00	1000.694 81.545
14.800	1057.00 86.00	1067.547 86.858
15.200	1004.00 96.00	1020.297 97.558
16.000	1143.00 110.00	1174.834 113.064
16.500	1204.00 115.00	1245.600 118.973
17.400	1169.00 112.00	1222.325 117.109
17.800	1286.00 123.00	1350.492 129.168
18.200	1158.00 111.00	1221.068 117.045
18.700	1180.00 113.00	1250.278 119.730

FITTED PARAMETERS

NUCLEAR TEMP. = 1.401 PLUS-OR-MINUS .080 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1284.03 PLUS-OR-MINUS 40.48 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1518.11 MB
 (N,2N) THRESHOLD = 10.46 MEV
 (N,3N) THRESHOLD = 18.86 MEV
 THIS ISOTOPE HAS 38 NEUTRONS, 31 PROTONS, (MASS = 69)
 NEUTRON EXCESS PARAMETER = .10145
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8450 PLUS-OR-MINUS .0267
 T*SQRT(N) = 8.636 ERROR .493
 T*SQRT(A) = 11.630 ERROR .665



GA-69 ... FROM REF. B 65 (843)

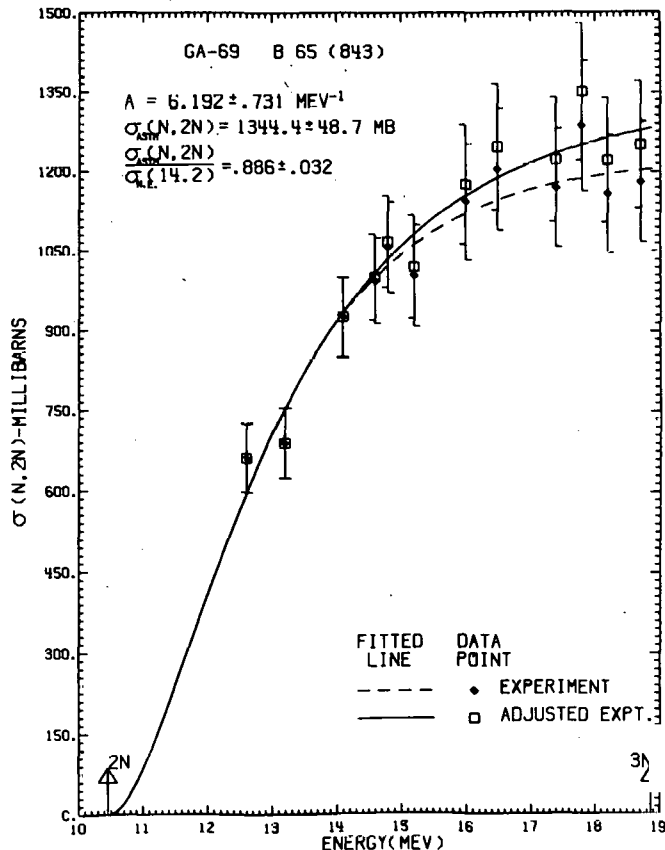
ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
12.600	660.00 64.00	660.000 64.000
13.200	688.00 66.00	688.000 66.000
14.100	925.00 75.00	925.000 75.000
14.600	994.00 81.00	1000.694 81.545
14.800	1057.00 86.00	1067.547 86.858
15.200	1004.00 96.00	1020.297 97.558
16.000	1143.00 110.00	1174.834 113.064
16.500	1204.00 115.00	1245.600 118.973
17.400	1169.00 112.00	1222.325 117.109
17.800	1286.00 123.00	1350.492 129.168
18.200	1158.00 111.00	1221.068 117.045
18.700	1180.00 113.00	1250.278 119.730

FITTED PARAMETERS

LEVEL SPACING = 6.192 PLUS-OR-MINUS .731 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1344.45 PLUS-OR-MINUS 48.73 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1518.11 MB
 (N,2N) THRESHOLD = 10.46 MEV
 (N,3N) THRESHOLD = 18.86 MEV
 THIS ISOTOPE HAS 38 NEUTRONS, 31 PROTONS, (MASS = 69)
 NEUTRON EXCESS PARAMETER = .10145
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8856 PLUS-OR-MINUS .0321
 N/SPACING = 6.137 ERROR .725
 A/SPACING = 11.143 ERROR 1.316



GA-71 ... FROM REF. D 71

RGY	N,2N CROSS SECTION (MB)	
(1)	MEASURED, ERR	ADJUSTED, ERR
160	1098.00 26.00	1098.000 26.000
13.900	1153.00 25.00	1153.000 25.000
14.470	1135.00 25.00	1140.089 25.112
15.060	1130.00 32.00	1145.558 32.441
15.360	1148.00 23.00	1168.931 23.419
16.510	1046.00 127.00	1081.433 131.302

FITTED PARAMETERS

NUCLEAR TEMP. = .837 PLUS-OR-MINUS .085 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1169.14 PLUS-OR-MINUS 14.70 MB

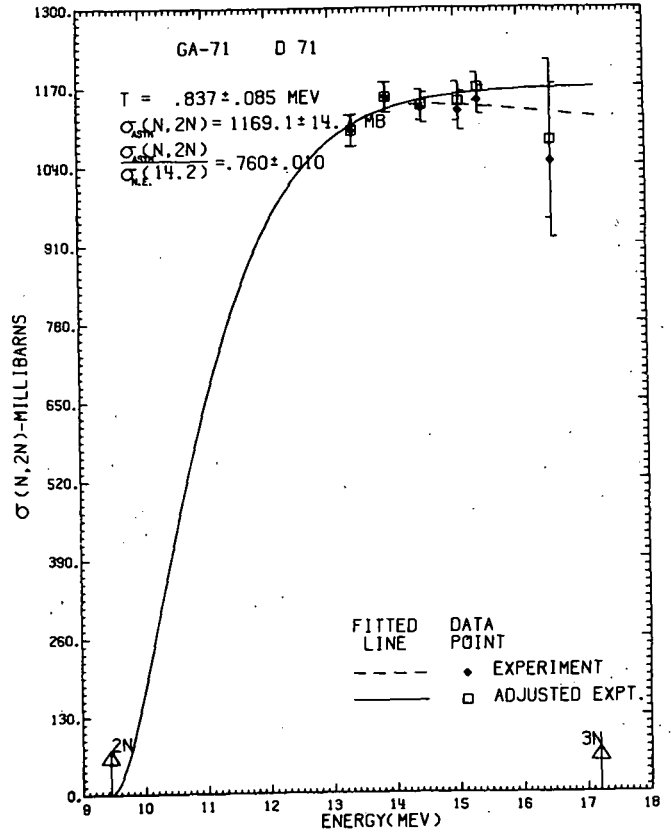
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1537.80 MB
 (N,2N) THRESHOLD = 9.44 MEV
 (N,3N) THRESHOLD = 17.20 MEV

THIS ISOTOPE HAS 40 NEUTRONS, 31 PROTONS, (MASS = 71)
 NEUTRON EXCESS PARAMETER = .12676

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7603 PLUS-OR-MINUS .0096

T*SQRT(N) = 5.294 T*SQRT(A) = 7.053
 ERROR .538 ERROR .716



GA-71 ... FROM REF. D 71

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
13.360	1098.00 26.00	1098.000 26.000
13.900	1153.00 25.00	1153.000 25.000
14.470	1135.00 25.00	1140.089 25.112
15.060	1130.00 32.00	1145.558 32.441
15.360	1148.00 23.00	1168.931 23.419
16.510	1046.00 127.00	1081.433 131.302

FITTED PARAMETERS

LEVEL SPACING = 18.383 PLUS-OR-MINUS 4.070 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1175.19 PLUS-OR-MINUS 16.22 MB

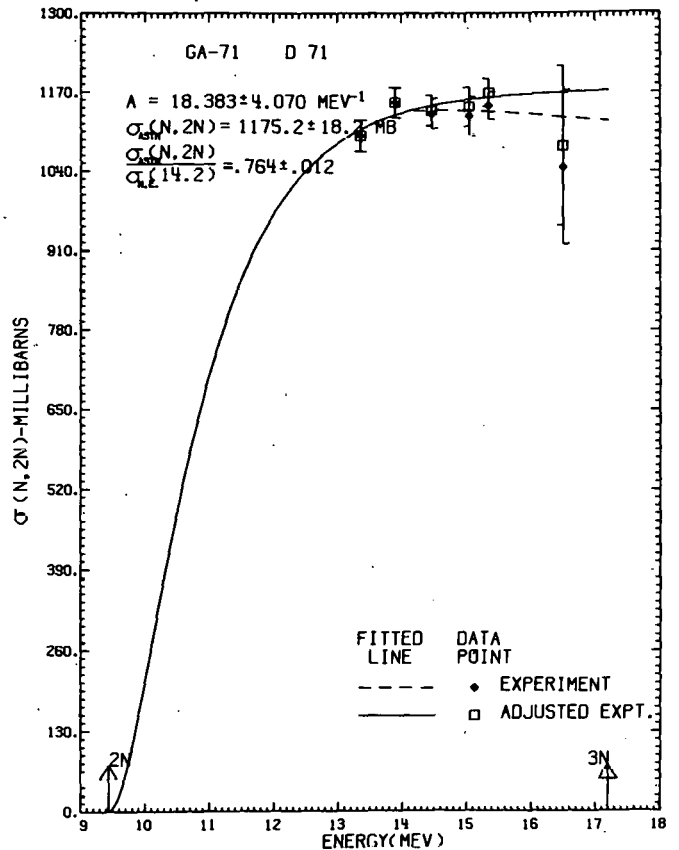
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1537.80 MB
 (N,2N) THRESHOLD = 9.44 MEV
 (N,3N) THRESHOLD = 17.20 MEV

THIS ISOTOPE HAS 40 NEUTRONS, 31 PROTONS, (MASS = 71)
 NEUTRON EXCESS PARAMETER = .12676

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7642 PLUS-OR-MINUS .0118

N/SPACING = 2.176 A/SPACING = 3.862
 ERROR .482 ERROR .855

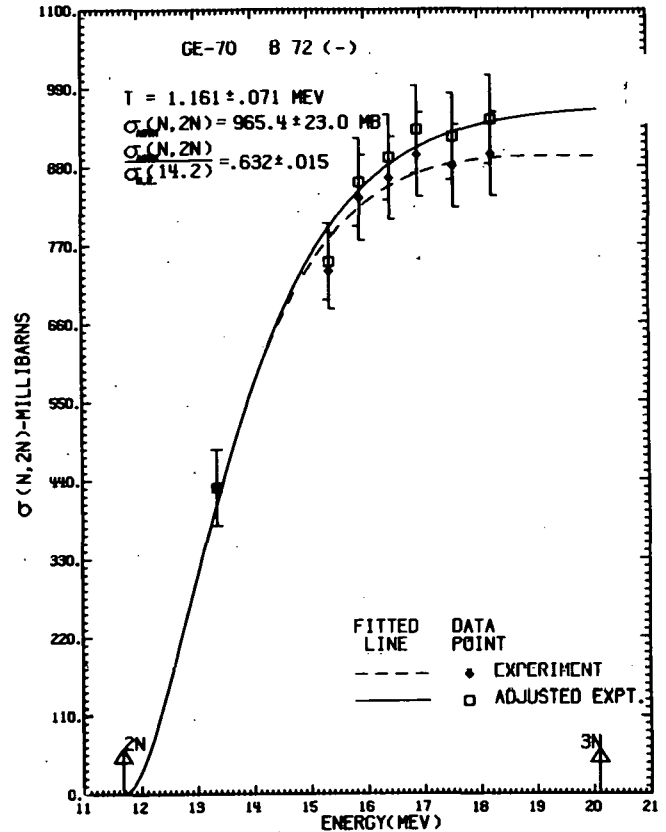


GE-70 ... FROM REF. B 72 (-)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB) ADJUSTED, ERR
13.370	430.10 53.40	430.100 53.400
15.370	733.00 52.80	746.624 53.781
15.910	835.90 60.10	857.880 61.680
16.440	863.20 57.80	892.009 59.729
16.930	895.90 59.10	931.302 61.435
17.560	880.10 58.10	921.358 60.824
18.230	897.20 59.20	945.735 62.402

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.161 PLUS-OR-MINUS .071 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 965.41 PLUS-OR-MINUS 23.04 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1527.99 MB
 (N,2N) THRESHOLD = 11.70 MEV
 (N,3N) THRESHOLD = 20.10 MEV
 THIS ISOTOPE HAS 38 NEUTRONS, 32 PROTONS, (MASS = 70)
 NEUTRON EXCESS PARAMETER = .08571
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .6318 PLUS-OR-MINUS .0151
 T*SQRT(N) = 7.157 T*SQRT(A) = 9.714
 ERROR .438 ERROR .594

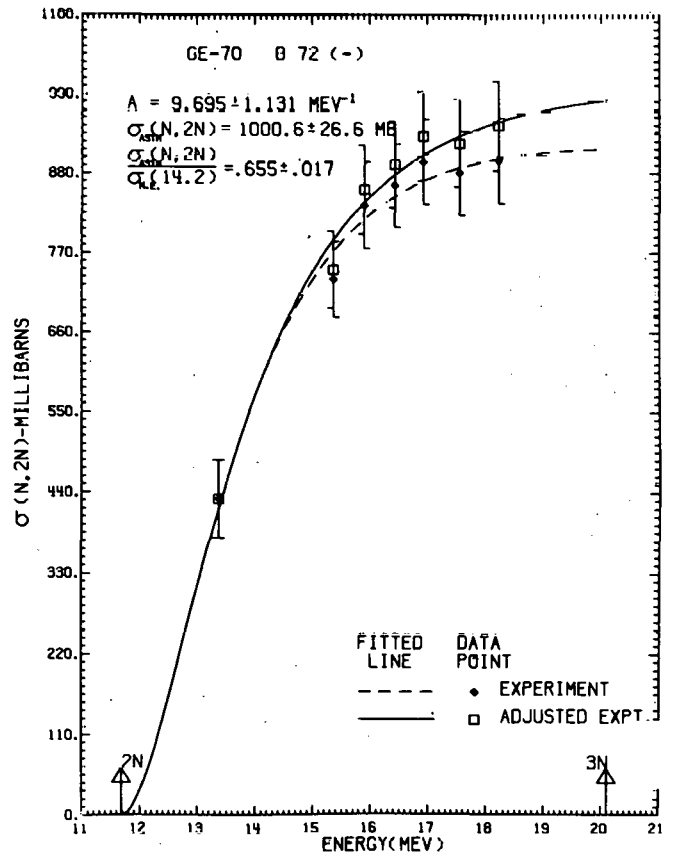


GE-70 ... FROM REF. B 72 (-)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB) ADJUSTED, ERR
13.370	430.10 53.40	430.100 53.400
15.370	733.00 52.80	746.624 53.781
15.910	835.90 60.10	857.880 61.680
16.440	863.20 57.80	892.009 59.729
16.930	895.90 59.10	931.302 61.435
17.560	880.10 58.10	921.358 60.824
18.230	897.20 59.20	945.735 62.402

FITTED PARAMETERS
 LEVEL SPACING = 9.695 PLUS-OR-MINUS 1.131 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1000.61 PLUS-OR-MINUS 26.62 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1527.99 MB
 (N,2N) THRESHOLD = 11.70 MEV
 (N,3N) THRESHOLD = 20.10 MEV
 THIS ISOTOPE HAS 38 NEUTRONS, 32 PROTONS, (MASS = 70)
 NEUTRON EXCESS PARAMETER = .08571
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .6549 PLUS-OR-MINUS .0174
 N/SPACING = 3.920 A/SPACING = 7.220
 ERROR .457 ERROR .842



GE-70 ... FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.400	379.00 11.00	379.000	11.000
13.690	461.00 14.00	461.000	14.000
13.880	509.00 15.00	509.000	15.000
14.010	508.00 15.00	508.000	15.000
14.310	607.00 18.00	608.132	18.034
14.500	621.00 19.00	624.121	19.096
14.680	664.00 20.00	669.281	20.159
14.810	716.00 21.00	723.180	21.211
14.930	681.00 20.00	689.112	20.238
16.500	843.00 42.00	871.786	43.434
17.950	895.00 45.00	940.783	47.302
19.760	941.00 47.00	1005.402	50.217

FITTED PARAMETERS

NUCLEAR TEMP. = 1.292 PLUS-OR-MINUS .038 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 996.20 PLUS-OR-MINUS 26.73 MB

RELATED DATA

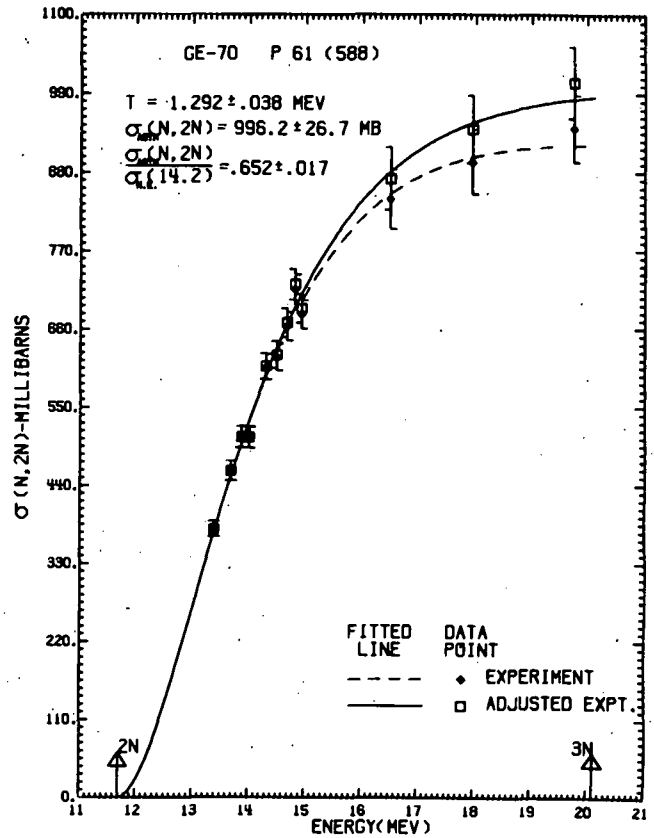
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1527.99 MB
 (N,2N) THRESHOLD = 11.70 MEV
 (N,3N) THRESHOLD = 20.10 MEV

THIS ISOTOPE HAS 38 NEUTRONS, 32 PROTONS, (MASS = 70)

NEUTRON EXCESS PARAMETER = .08571

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6520 PLUS-OR-MINUS .0175

T*SORT(N) = 7.964 T*SORT(A) = 10.810
 ERROR .234 ERROR .318



GE-70 ... FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.400	379.00 11.00	379.000	11.000
13.690	461.00 14.00	461.000	14.000
13.880	509.00 15.00	509.000	15.000
14.010	508.00 15.00	508.000	15.000
14.310	607.00 18.00	608.132	18.034
14.500	621.00 19.00	624.121	19.096
14.680	664.00 20.00	669.281	20.159
14.810	716.00 21.00	723.180	21.211
14.930	681.00 20.00	689.112	20.238
16.500	843.00 42.00	871.786	43.434
17.950	895.00 45.00	940.783	47.302
19.760	941.00 47.00	1005.402	50.217

FITTED PARAMETERS

LEVEL SPACING = 7.499 PLUS-OR-MINUS .493 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1055.25 PLUS-OR-MINUS 33.02 MB

RELATED DATA

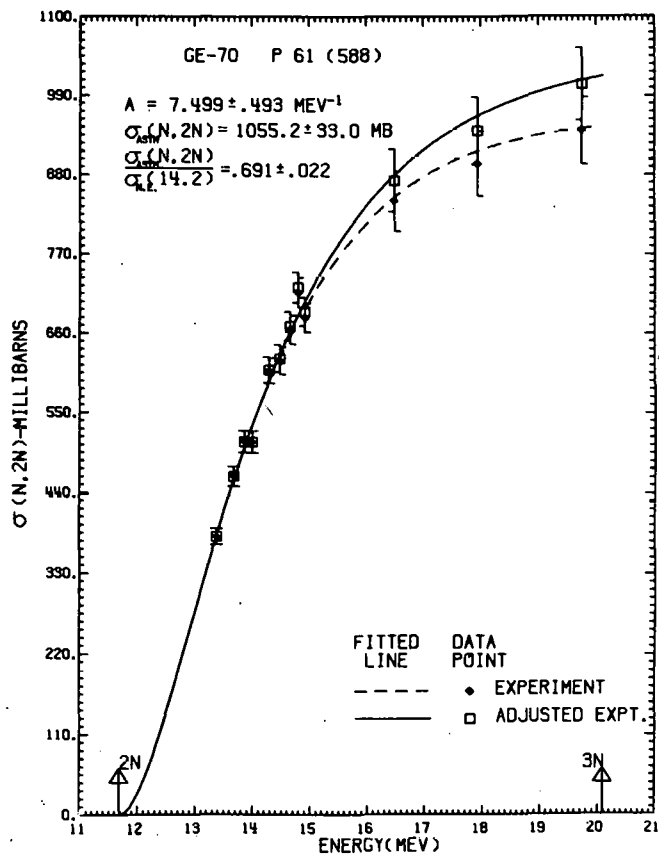
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1527.99 MB
 (N,2N) THRESHOLD = 11.70 MEV
 (N,3N) THRESHOLD = 20.10 MEV

THIS ISOTOPE HAS 38 NEUTRONS, 32 PROTONS, (MASS = 70)

NEUTRON EXCESS PARAMETER = .08571

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6906 PLUS-OR-MINUS .0216

N/SPACING = 5.067 A/SPACING = 9.335
 ERROR .333 ERROR .614



GE-76 ... FROM REF. S 70

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR	MEASURED, ERR	ADJUSTED, ERR
12.400	737.00 13.00	737.000 13.000	737.000 13.000	737.000 13.000
13.000	1000.00 180.00	1000.000 180.000	1000.000 180.000	1000.000 180.000
14.000	1160.00 130.00	1160.000 130.000	1160.000 130.000	1160.000 130.000
14.700	1170.00 140.00	1179.073 141.086	1179.073 141.086	1179.073 141.086
15.500	1320.00 150.00	1345.293 152.874	1345.293 152.874	1345.293 152.874
16.000	1200.00 200.00	1230.854 205.142	1230.854 205.142	1230.854 205.142

FITTED PARAMETERS

NUCLEAR TEMP. = 1.735 PLUS-OR-MINUS .102 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1521.50 PLUS-OR-MINUS 93.38 MB

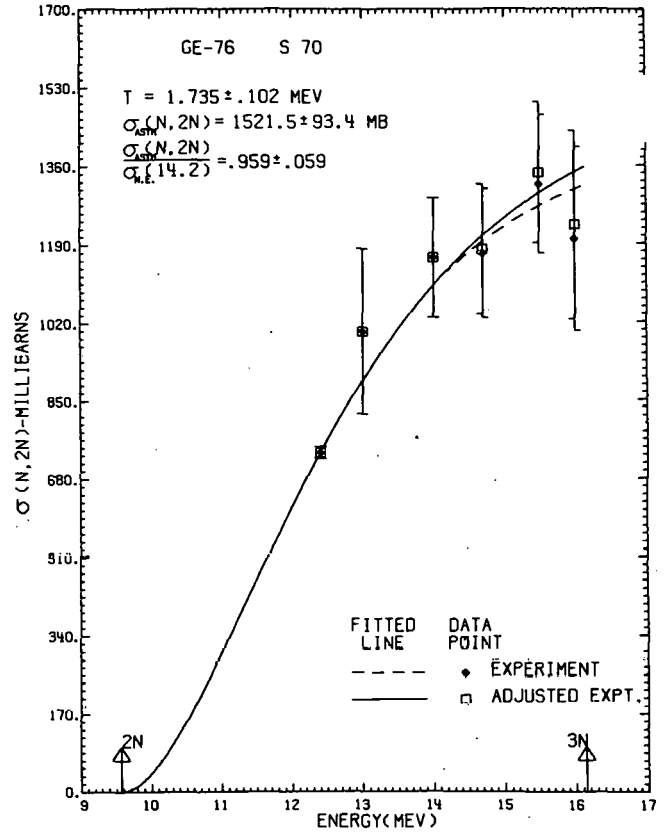
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1585.73 MB
 (N,2N) THRESHOLD = 9.57 MEV
 (N,3N) THRESHOLD = 16.14 MEV

THIS ISOTOPE HAS 44 NEUTRONS, 32 PROTONS, (MASS = 76)
 NEUTRON EXCESS PARAMETER = .15789

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .9595 PLUS-OR-MINUS .0589

T*SORT(N) = 11.509 T*SORT(A) = 15.125
 ERROR .677 ERROR .889



GE-76 ... FROM REF. S 70

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR	MEASURED, ERR	ADJUSTED, ERR
12.400	737.00 13.00	737.000 13.000	737.000 13.000	737.000 13.000
13.000	1000.00 180.00	1000.000 180.000	1000.000 180.000	1000.000 180.000
14.000	1160.00 130.00	1160.000 130.000	1160.000 130.000	1160.000 130.000
14.700	1170.00 140.00	1179.073 141.086	1179.073 141.086	1179.073 141.086
15.500	1320.00 150.00	1345.293 152.874	1345.293 152.874	1345.293 152.874
16.000	1200.00 200.00	1230.854 205.142	1230.854 205.142	1230.854 205.142

FITTED PARAMETERS

LEVEL SPACING = 3.297 PLUS-OR-MINUS .509 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1722.35 PLUS-OR-MINUS 150.00 MB

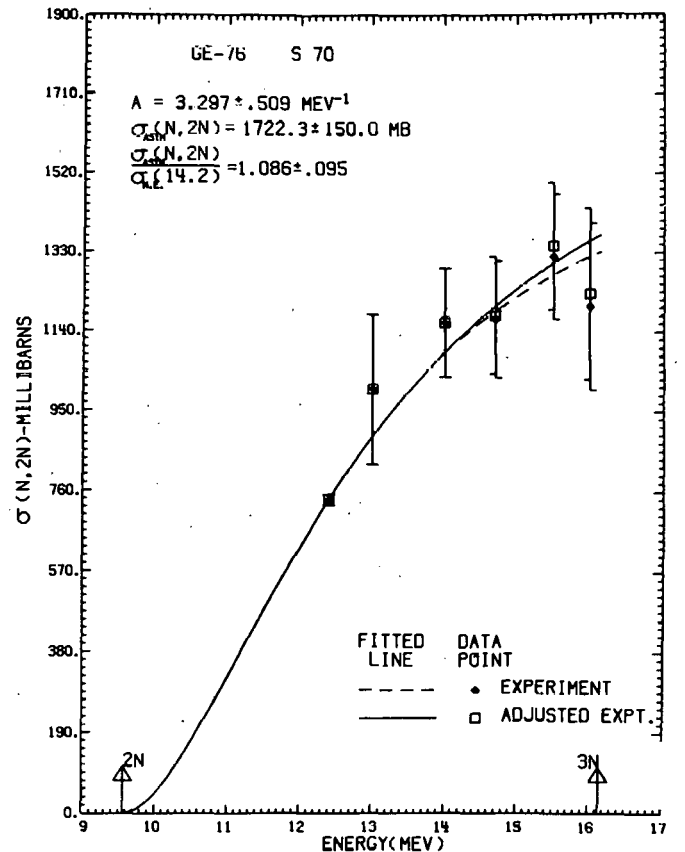
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1585.73 MB
 (N,2N) THRESHOLD = 9.57 MEV
 (N,3N) THRESHOLD = 16.14 MEV

THIS ISOTOPE HAS 44 NEUTRONS, 32 PROTONS, (MASS = 76)
 NEUTRON EXCESS PARAMETER = .15789

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.0862 PLUS-OR-MINUS .0946

N/SPACING = 13.345 A/SPACING = 23.051
 ERROR 2.060 ERROR 3.559



GE-76 ... FROM REF. 0 67 (1871)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ERR	ADJUSTED	ERR
13.390	974.00	39.00	974.000	39.000	
13.640	1024.00	41.00	1024.000	41.000	
13.780	1084.00	43.00	1084.000	43.000	
14.110	1154.00	46.00	1154.000	46.000	
14.440	1123.00	45.00	1127.250	45.170	
14.590	1178.00	47.00	1185.175	47.286	
14.860	1334.00	53.00	1347.515	53.537	
14.960	1438.00	57.00	1454.669	57.661	

FITTED PARAMETERS

NUCLEAR TEMP. = 2.441 PLUS-OR-MINUS .518 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2061.09 PLUS-OR-MINUS 419.48 MB

RELATED DATA

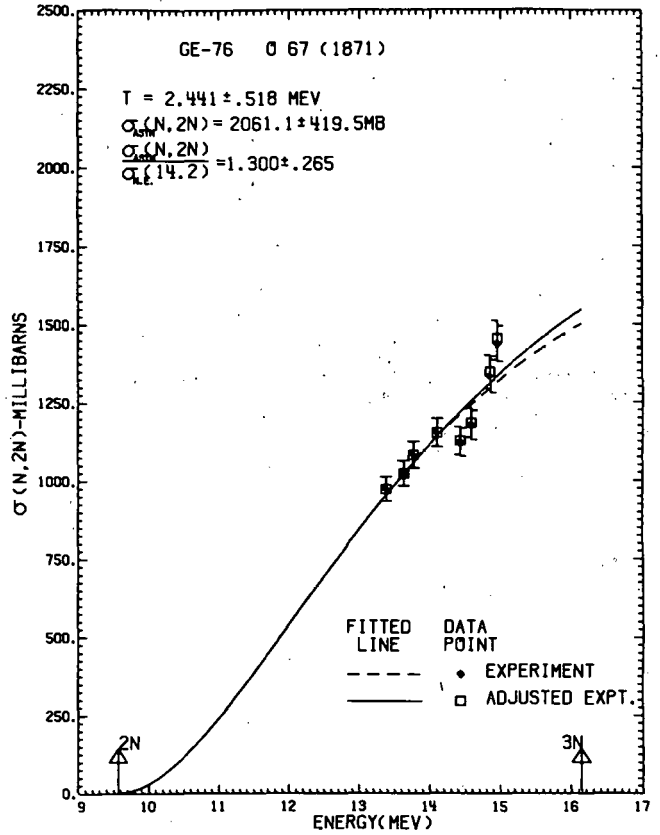
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1585.73 MB
 (N,2N) THRESHOLD = 9.57 MEV
 (N,3N) THRESHOLD = 16.14 MEV

THIS ISOTOPE HAS 44 NEUTRONS, 32 PROTONS, (MASS = 76)

NEUTRON EXCESS PARAMETER = .15789

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.2998 PLUS-OR-MINUS .2645

T*SQRT(N) = 16.192 T*SQRT(A) = 21.280
 ERROR 3.436 ERROR 4.516



GE-76 ... FROM REF. 0 67 (1871)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ERR	ADJUSTED	ERR
13.390	974.00	39.00	974.000	39.000	
13.640	1024.00	41.00	1024.000	41.000	
13.780	1084.00	43.00	1084.000	43.000	
14.110	1154.00	46.00	1154.000	46.000	
14.440	1123.00	45.00	1127.250	45.170	
14.590	1178.00	47.00	1185.175	47.286	
14.860	1334.00	53.00	1347.515	53.537	
14.960	1438.00	57.00	1454.669	57.661	

FITTED PARAMETERS

LEVEL SPACING = 1.459 PLUS-OR-MINUS .827 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2663.73 PLUS-OR-MINUS 864.19 MB

RELATED DATA

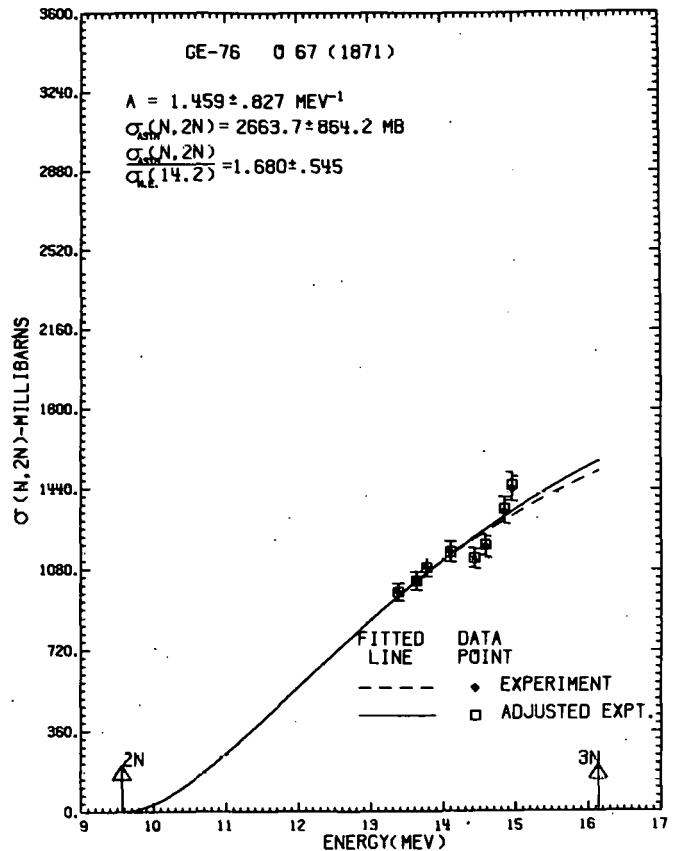
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1585.73 MB
 (N,2N) THRESHOLD = 9.57 MEV
 (N,3N) THRESHOLD = 16.14 MEV

THIS ISOTOPE HAS 44 NEUTRONS, 32 PROTONS, (MASS = 76)

NEUTRON EXCESS PARAMETER = .15789

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.6798 PLUS-OR-MINUS .5450

N/SPACING = 30.158 A/SPACING = 52.090
 ERROR 17.094 ERROR 29.526

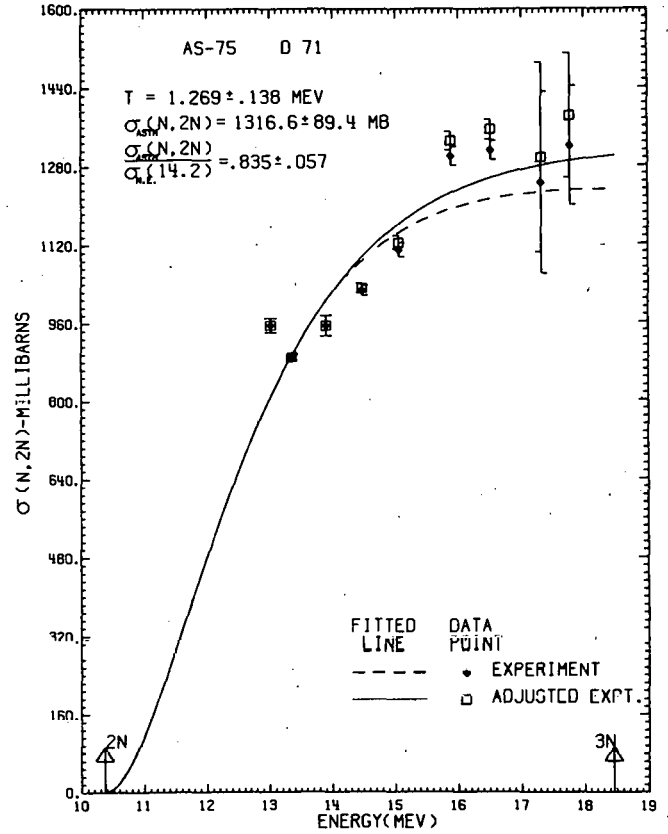


AS-75 ...FROM REF. D 71

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB) ERR	ADJUSTED	ERR
13.020	955.00	15.00	955.000	15.000
13.360	890.00	6.00	890.000	6.000
13.900	955.00	21.00	955.000	21.000
14.470	1027.00	10.00	1031.411	10.043
15.060	1109.00	14.00	1123.613	14.184
15.880	1299.00	19.00	1330.762	19.465
16.510	1312.00	20.00	1354.427	20.647
17.320	1245.00	186.00	1296.762	193.733
17.780	1321.00	122.00	1382.299	127.661

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.269 PLUS-OR-MINUS .138 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1316.63 PLUS-OR-MINUS 89.43 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1576.28 MB
 (N,2N) THRESHOLD = 10.38 MEV
 (N,3N) THRESHOLD = 18.46 MEV
 THIS ISOTOPE HAS 42 NEUTRONS, 33 PROTONS, (MASS = 75)
 NEUTRON EXCESS PARAMETER = .12000
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8353 PLUS-OR-MINUS .0567
 $I = \sqrt{QRT(N)} = 8.274$ $I = \sqrt{QRT(A)} = 10.990$
 ERROR .894 ERROR 1.195

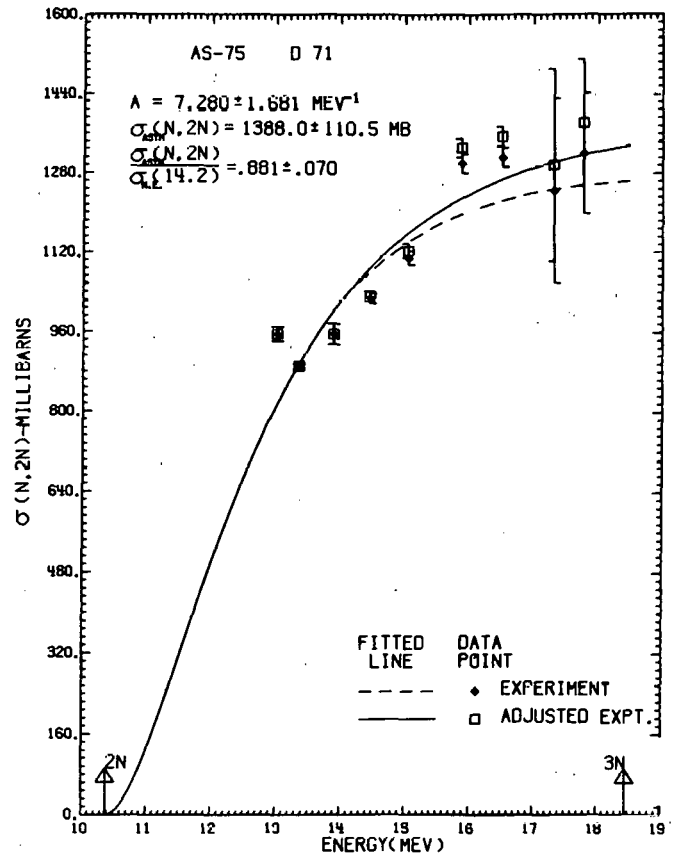


AS-75 ...FROM REF. D 71

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB) ERR	ADJUSTED	ERR
13.020	955.00	15.00	955.000	15.000
13.360	890.00	6.00	890.000	6.000
13.900	955.00	21.00	955.000	21.000
14.470	1027.00	10.00	1031.411	10.043
15.060	1109.00	14.00	1123.613	14.184
15.880	1299.00	19.00	1330.762	19.465
16.510	1312.00	20.00	1354.427	20.647
17.320	1245.00	186.00	1296.762	193.733
17.780	1321.00	122.00	1382.299	127.661

FITTED PARAMETERS
 LEVEL SPACING = 7.280 PLUS-OR-MINUS 1.681 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1387.97 PLUS-OR-MINUS 110.53 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1576.28 MB
 (N,2N) THRESHOLD = 10.38 MEV
 (N,3N) THRESHOLD = 18.46 MEV
 THIS ISOTOPE HAS 42 NEUTRONS, 33 PROTONS, (MASS = 75)
 NEUTRON EXCESS PARAMETER = .12000
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8805 PLUS-OR-MINUS .0701
 $N/SPACING = 5.769$ $A/SPACING = 10.302$
 ERROR 1.332 ERROR 2.379



AS-75 ...FROM REF. B68 (2891)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.940	749.00	48.00	749.000	48.000
13.510	825.00	35.00	825.000	35.000
14.100	1018.00	65.00	1018.000	65.000
14.880	1109.00	71.00	1120.687	71.748
15.620	1123.00	72.00	1146.588	73.512
16.310	1181.00	76.00	1216.316	78.273
17.230	1160.00	74.00	1207.092	77.004
18.020	1163.00	74.00	1219.764	77.612

FITTED PARAMETERS

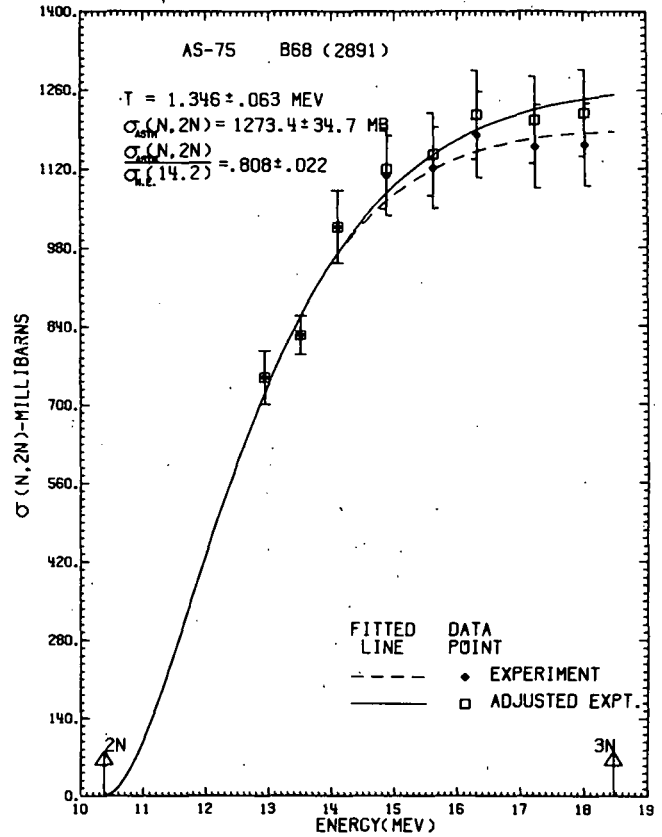
NUCLEAR TEMP. = 1.346 PLUS-OR-MINUS .063 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1273.40 PLUS-OR-MINUS 34.71 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1576.28 MB
 (N,2N) THRESHOLD = 10.38 MEV
 (N,3N) THRESHOLD = 18.46 MEV

THIS ISOTOPE HAS 42 NEUTRONS, 33 PROTONS, (MASS = 75)
 NEUTRON EXCESS PARAMETER = .12000
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8079 PLUS-OR-MINUS .0220

T*SQRT(N) = 8.723 T*SQRT(A) = 11.657
 ERROR .408 ERROR .546



AS-75 ...FROM REF. B68 (2891)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.940	749.00	48.00	749.000	48.000
13.510	825.00	35.00	825.000	35.000
14.100	1018.00	65.00	1018.000	65.000
14.880	1109.00	71.00	1120.687	71.748
15.620	1123.00	72.00	1146.588	73.512
16.310	1181.00	76.00	1216.316	78.273
17.230	1160.00	74.00	1207.092	77.004
18.020	1163.00	74.00	1219.764	77.612

FITTED PARAMETERS

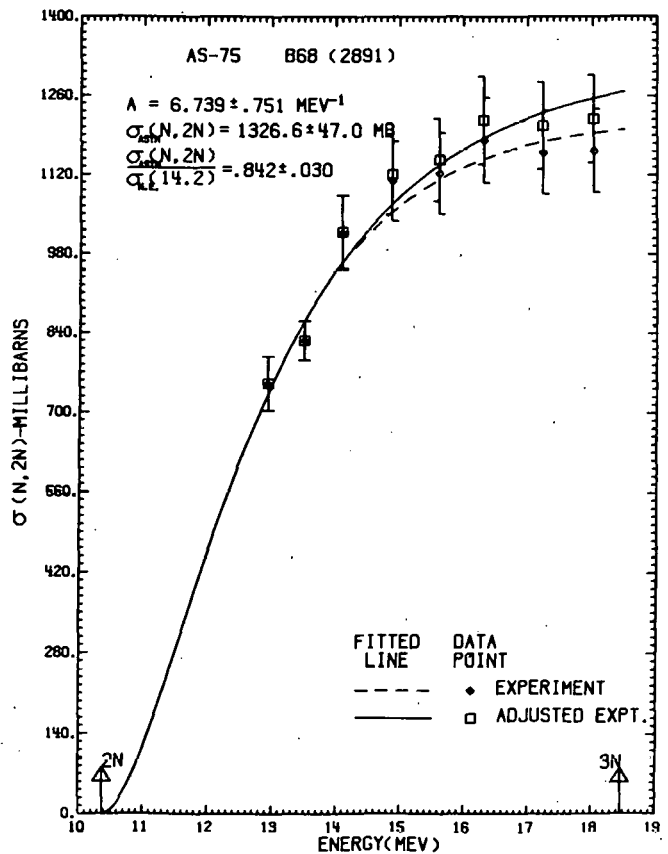
LEVEL SPACING = 6.739 PLUS-OR-MINUS .751 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1326.57 PLUS-OR-MINUS 47.01 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1576.28 MB
 (N,2N) THRESHOLD = 10.38 MEV
 (N,3N) THRESHOLD = 18.46 MEV

THIS ISOTOPE HAS 42 NEUTRONS, 33 PROTONS, (MASS = 75)
 NEUTRON EXCESS PARAMETER = .12000
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8416 PLUS-OR-MINUS .0298

N/SPACING = 6.232 A/SPACING = 11.129
 ERROR .695 ERROR 1.240

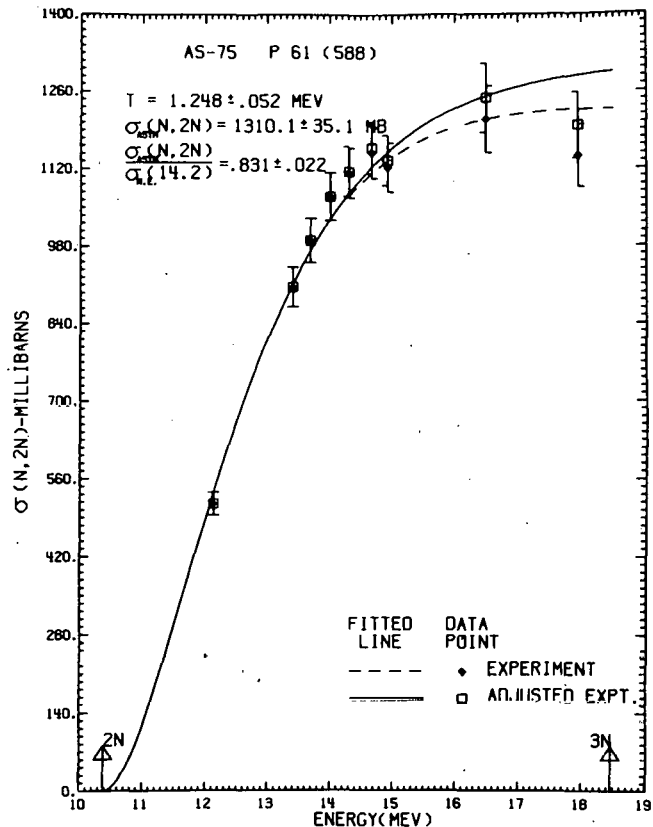


AS-75 ... FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.130	515.00	21.00	515.000	21.000
13.400	907.00	36.00	907.000	36.000
13.690	991.00	40.00	991.000	40.000
14.010	1070.00	43.00	1070.000	43.000
14.310	1113.00	45.00	1114.968	45.080
14.680	1149.00	46.00	1157.656	46.347
14.930	1123.00	45.00	1135.664	45.507
16.500	1210.00	61.00	1248.983	62.965
17.950	1143.00	57.00	1197.995	59.743

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.248 PLUS-OR-MINUS .052 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1310.14 PLUS-OR-MINUS 35.07 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1576.28 MB
 (N,2N) THRESHOLD = 10.38 MEV
 (N,3N) THRESHOLD = 18.46 MEV
 THIS ISOTOPE HAS 42 NEUTRONS, 33 PROTONS, (MASS = 75)
 NEUTRON EXCESS PARAMETER = .12000
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8312 PLUS-OR-MINUS .0222
 T*SURT(N) = 8.088 T*SURT(A) = 10.808
 ERROR .337 ERROR .450

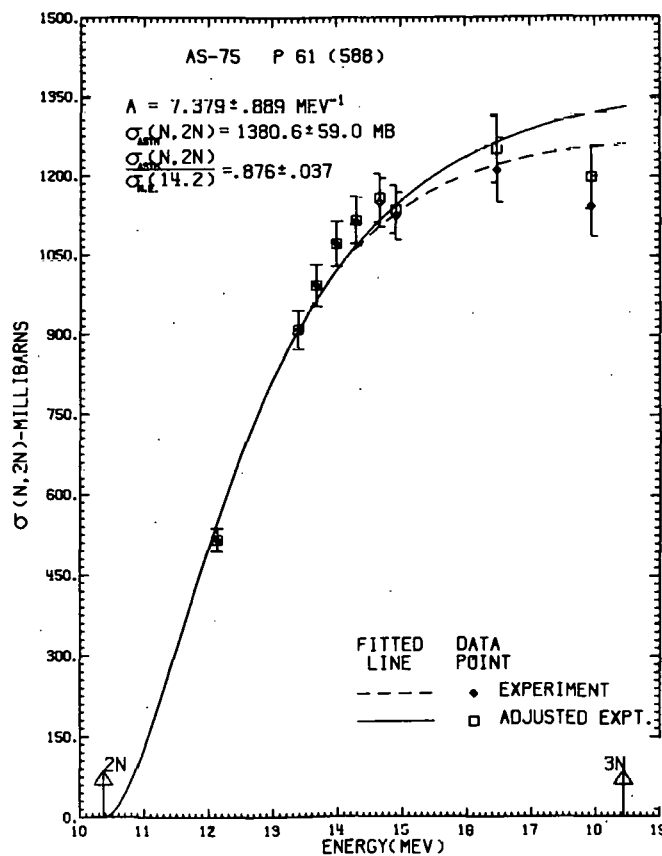


AS-75 ... FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.130	515.00	21.00	515.000	21.000
13.400	907.00	36.00	907.000	36.000
13.690	991.00	40.00	991.000	40.000
14.010	1070.00	43.00	1070.000	43.000
14.310	1113.00	45.00	1114.968	45.080
14.680	1149.00	46.00	1157.656	46.347
14.930	1123.00	45.00	1135.664	45.507
16.500	1210.00	61.00	1248.983	62.965
17.950	1143.00	57.00	1197.995	59.743

FITTED PARAMETERS
 LEVEL SPACING = 7.379 PLUS-OR-MINUS .889 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1380.60 PLUS-OR-MINUS 59.02 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1576.28 MB
 (N,2N) THRESHOLD = 10.38 MEV
 (N,3N) THRESHOLD = 18.46 MEV
 THIS ISOTOPE HAS 42 NEUTRONS, 33 PROTONS, (MASS = 75)
 NEUTRON EXCESS PARAMETER = .12000
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8759 PLUS-OR-MINUS .0374
 N/SPACING = 5.692 A/SPACING = 10.164
 ERROR .686 ERROR 1.225

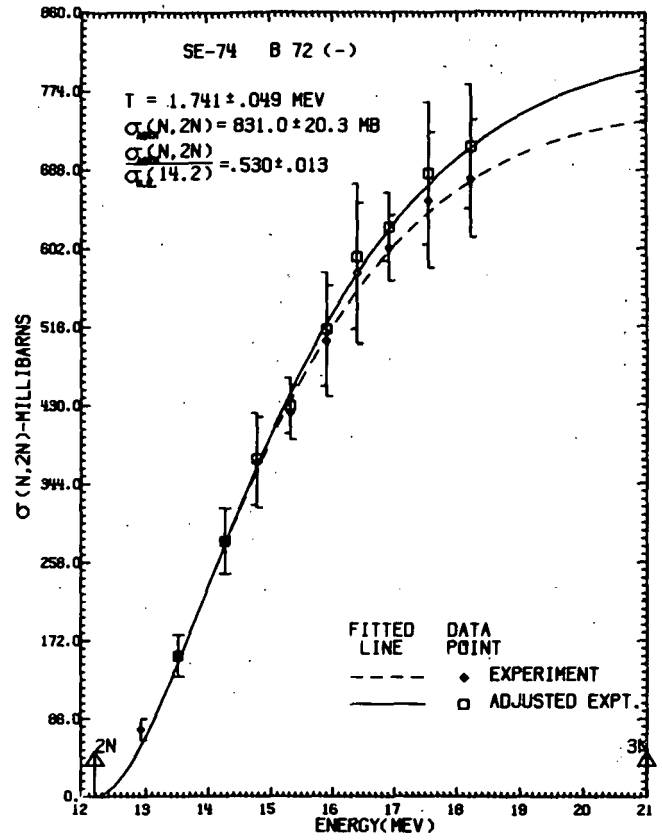


SE-74 FROM REF. B 72 (-)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13,560	155,00	23,00	155,000	23,000
14,310	281,00	36,00	281,502	36,064
14,820	368,00	50,00	371,588	50,487
15,350	423,00	30,00	430,399	30,525
15,930	501,00	61,00	513,718	62,549
16,410	575,00	77,00	593,106	79,425
16,920	603,00	36,00	625,657	37,353
17,550	655,00	74,00	684,185	77,297
18,220	679,00	64,00	713,888	67,288

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.741 PLUS-OR-MINUS .049 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 830.97 PLUS-OR-MINUS 20.34 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1566.77 MB
 (N,2N) THRESHOLD = 12.23 MEV
 (N,3N) THRESHOLD = 21.00 MEV
 THIS ISOTOPE HAS 40 NEUTRONS, 34 PROTONS, (MASS = 74)
 NEUTRON EXCESS PARAMETER = .08108
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5304 PLUS-OR-MINUS .0130
 T=SQRT(N) = 11.011 ERROR .310 T=SQRT(A) = 14.977 ERROR .422

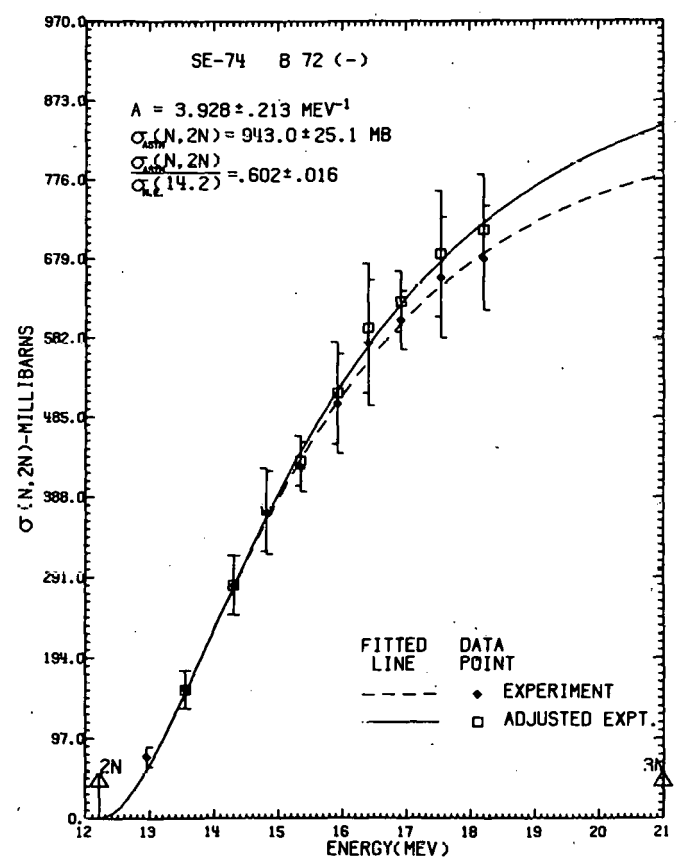


SE-74 FROM REF. B 72 (-)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13,560	155,00	23,00	155,000	23,000
14,310	281,00	36,00	281,502	36,064
14,820	368,00	50,00	371,588	50,487
15,350	423,00	30,00	430,399	30,525
15,930	501,00	61,00	513,718	62,549
16,410	575,00	77,00	593,106	79,425
16,920	603,00	36,00	625,657	37,353
17,550	655,00	74,00	684,185	77,297
18,220	679,00	64,00	713,888	67,288

FITTED PARAMETERS
 LEVEL SPACING = 3.928 PLUS-OR-MINUS .213 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 942.95 PLUS-OR-MINUS 25.08 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1566.77 MB
 (N,2N) THRESHOLD = 12.23 MEV
 (N,3N) THRESHOLD = 21.00 MEV
 THIS ISOTOPE HAS 40 NEUTRONS, 34 PROTONS, (MASS = 74)
 NEUTRON EXCESS PARAMETER = .08108
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6018 PLUS-OR-MINUS .0160
 N/SPACING = 10.183 ERROR .352 A/SPACING = 18.839 ERROR 1.022



SE-74 ... FROM REF. A 69 (2366)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	MEASURED, ERR	ADJUSTED, ERR
13.710	233.50	7.90	233.500	7.900
14.170	331.90	12.30	331.900	12.300
15.020	510.30	11.50	516.798	11.646
15.220	565.10	9.00	573.939	9.141
15.930	574.10	8.10	588.674	8.306
16.270	496.90	12.20	511.681	12.563
16.610	672.30	17.10	695.106	17.680
17.090	642.70	13.20	668.096	13.722
17.580	654.60	31.20	683.975	32.600

FITTED PARAMETERS

NUCLEAR TEMP. = 1.185 PLUS-OR-MINUS .153 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 722.47 PLUS-OR-MINUS 60.21 MB

RELATED DATA

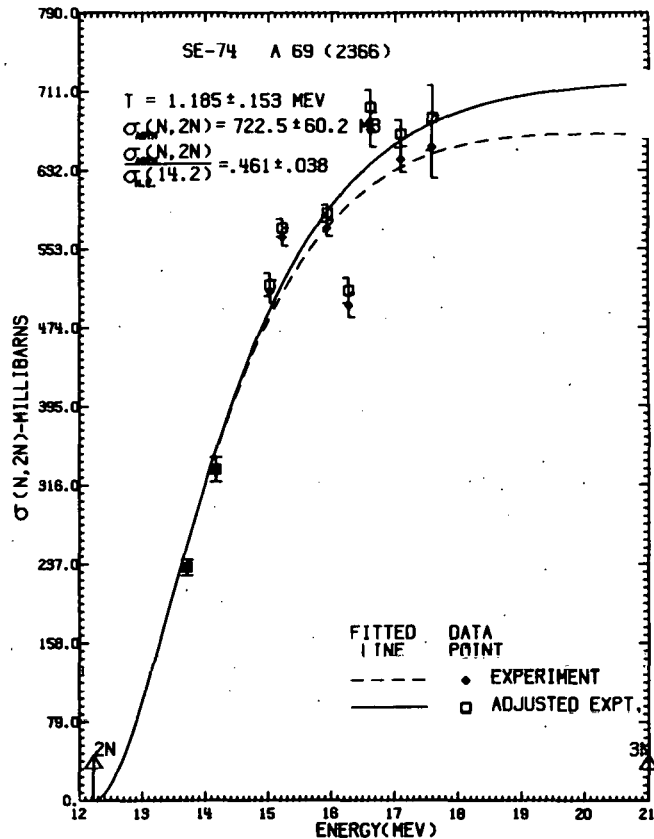
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1566.77 MB
 (N,2N) THRESHOLD = 12.23 MEV
 (N,3N) THRESHOLD = 21.00 MEV

THIS ISOTOPE HAS 40 NEUTRONS, 34 PROTONS, (MASS = 74)

NEUTRON EXCESS PARAMETER = .08108

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4611 PLUS-OR-MINUS .0384

$T \cdot \sqrt{\sigma(N)} = 7.495$ $T \cdot \sqrt{\sigma(A)} = 10.194$
 ERROR .968 ERROR 1.316



SE-74 ... FROM REF. A 69 (2366)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	MEASURED, ERR	ADJUSTED, ERR
13.710	233.50	7.90	233.500	7.900
14.170	331.90	12.30	331.900	12.300
15.020	510.30	11.50	516.798	11.646
15.220	565.10	9.00	573.939	9.141
15.930	574.10	8.10	588.674	8.306
16.270	496.90	12.20	511.681	12.563
16.610	672.30	17.10	695.106	17.680
17.090	642.70	13.20	668.096	13.722
17.580	654.60	31.20	683.975	32.600

FITTED PARAMETERS

LEVEL SPACING = 9.039 PLUS-OR-MINUS 2.644 PFR MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 768.71 PLUS-OR-MINUS 80.96 MB

RELATED DATA

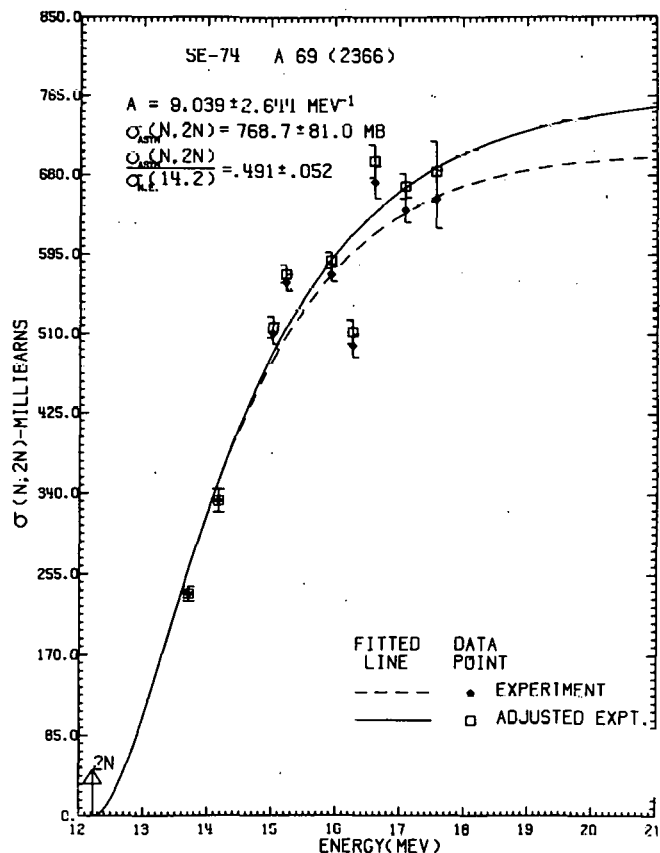
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1566.77 MB
 (N,2N) THRESHOLD = 12.23 MEV
 (N,3N) THRESHOLD = 21.00 MEV

THIS ISOTOPE HAS 40 NEUTRONS, 34 PROTONS, (MASS = 74)

NEUTRON EXCESS PARAMETER = .08108

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4906 PLUS-OR-MINUS .0517

$N/SPACING = 4.425$ $A/SPACING = 8.187$
 ERROR 1.294 ERROR 2.395



SE-74 ... FROM REF. B 66 (2894)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.100	300.00	22.00	300.000	22.000
14.900	472.00	47.00	477.170	47.515
16.300	540.00	45.00	556.266	46.356
17.200	608.00	50.00	632.774	52.037
18.000	639.00	53.00	670.443	55.608
19.600	662.00	55.00	704.154	58.502

FITTED PARAMETERS

NUCLEAR TEMP. = 1.277 PLUS-OR-MINUS .062 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 707.30 PLUS-OR-MINUS 22.89 MB

RELATED DATA

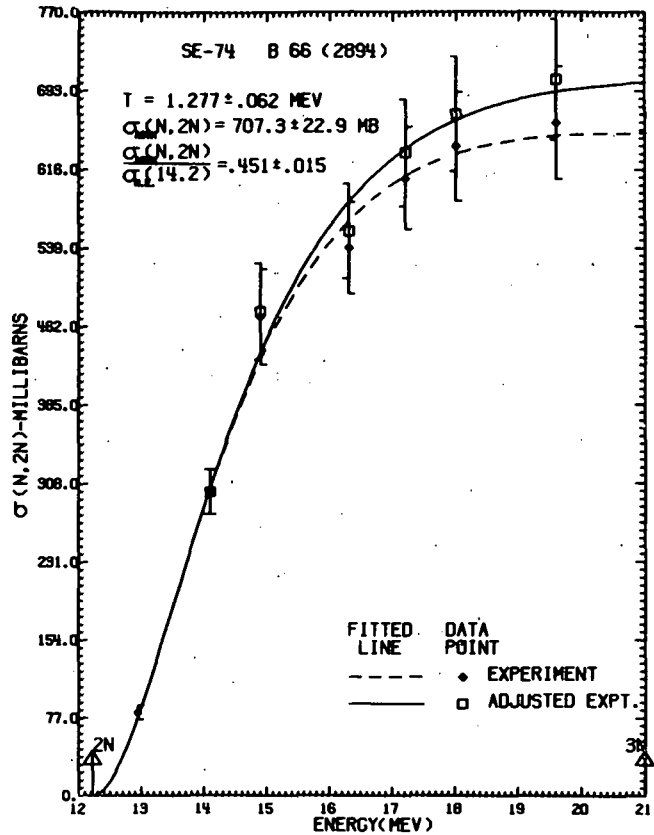
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1566.77 MB
 (N,2N) THRESHOLD = 12.23 MEV
 (N,3N) THRESHOLD = 21.00 MEV

THIS ISOTOPE HAS 40 NEUTRONS, 34 PROTONS, (MASS = 74)

NEUTRON EXCESS PARAMETER = .08108

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4514 PLUS-OR-MINUS .0146

T*SQRT(N) = 8.076 T*SQRT(A) = 10.985
 ERROR .392 ERROR .533



SE-74 ... FROM REF. B 66 (2894)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.100	300.00	22.00	300.000	22.000
14.900	472.00	47.00	477.170	47.515
16.300	540.00	45.00	556.266	46.356
17.200	608.00	50.00	632.774	52.037
18.000	639.00	53.00	670.443	55.608
19.600	662.00	55.00	704.154	58.502

FITTED PARAMETERS

LEVEL SPACING = 8.093 PLUS-OR-MINUS .843PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 740.40 PLUS-OR-MINUS 27.72 MB

RELATED DATA

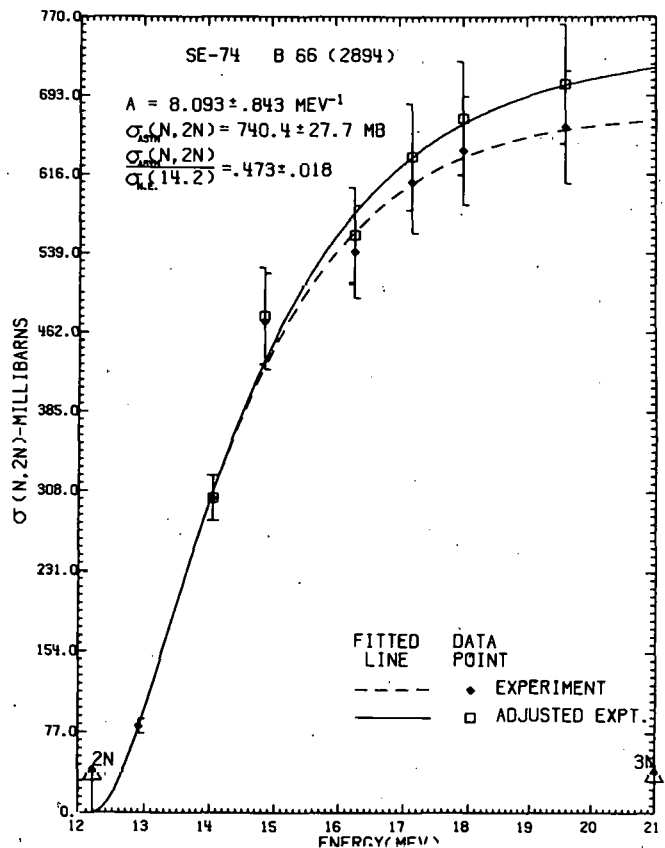
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1566.77 MB
 (N,2N) THRESHOLD = 12.23 MEV
 (N,3N) THRESHOLD = 21.00 MEV

THIS ISOTOPE HAS 40 NEUTRONS, 34 PROTONS, (MASS = 74)

NEUTRON EXCESS PARAMETER = .08108

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4726 PLUS-OR-MINUS .0177

N/SPACING = 4.943 A/SPACING = 9.144
 ERROR .519 ERROR .952



BR-79 ... FROM REF. B 67 (2888)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ERR	ADJUSTED	ERR
13.180	791.00	85.00	791.000	85.000	
13.460	837.00	89.00	837.000	89.000	
13.710	870.00	93.00	870.000	93.000	
13.980	912.00	98.00	912.000	98.000	
14.240	969.00	104.00	969.000	104.064	
14.510	997.00	107.00	1001.701	107.505	
14.760	968.00	103.00	976.111	103.863	
15.530	993.00	106.00	1011.800	108.007	
16.250	921.00	98.00	946.668	100.731	

FITTED PARAMETERS

NUCLEAR TEMP. = .804 PLUS-OR-MINUS .054 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1012.53 PLUS-OR-MINUS 23.08 MB

RELATED DATA

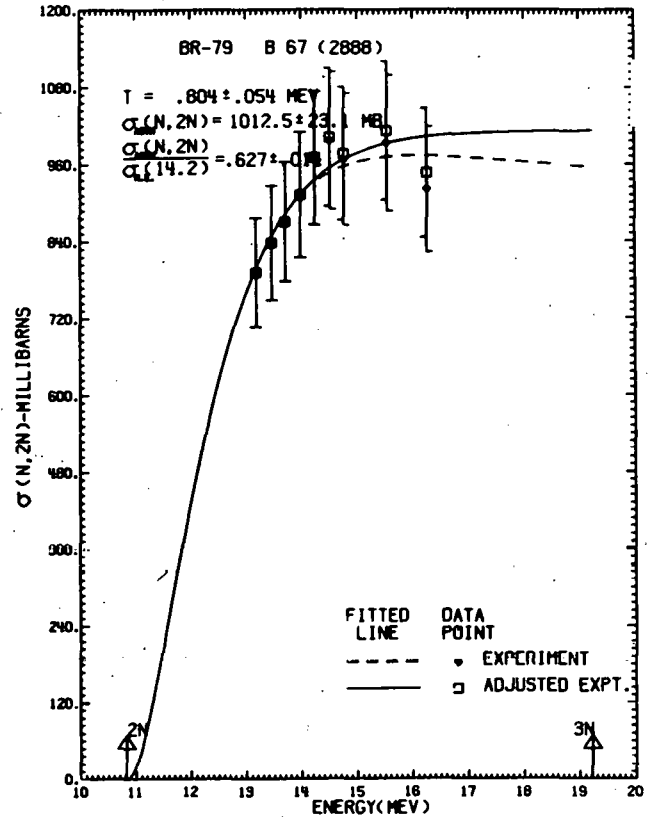
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1613.65 MB
 (N,2N) THRESHOLD = 10.83 MEV
 (N,3N) THRESHOLD = 19.22 MEV

THIS ISOTOPE HAS 44 NEUTRONS, 35 PROTONS, (MASS = 79)

NEUTRON EXCESS PARAMETER = .11392

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6275 PLUS-OR-MINUS .0143

T=SORT(N) = 5.333 T=SORT(A) = 7.146
 ERROR .350 ERROR .480



BR-79 ... FROM REF. B 67 (2888)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ERR	ADJUSTED	ERR
13.180	791.00	85.00	791.000	85.000	
13.460	837.00	89.00	837.000	89.000	
13.710	870.00	93.00	870.000	93.000	
13.980	912.00	98.00	912.000	98.000	
14.240	969.00	104.00	969.000	104.064	
14.510	997.00	107.00	1001.701	107.505	
14.760	968.00	103.00	976.111	103.863	
15.530	993.00	106.00	1011.800	108.007	
16.250	921.00	98.00	946.668	100.731	

FITTED PARAMETERS

LEVEL SPACING = 10.944 PLUS-OR-MINUS 3.021 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1024.16 PLUS-OR-MINUS 28.09 MB

RELATED DATA

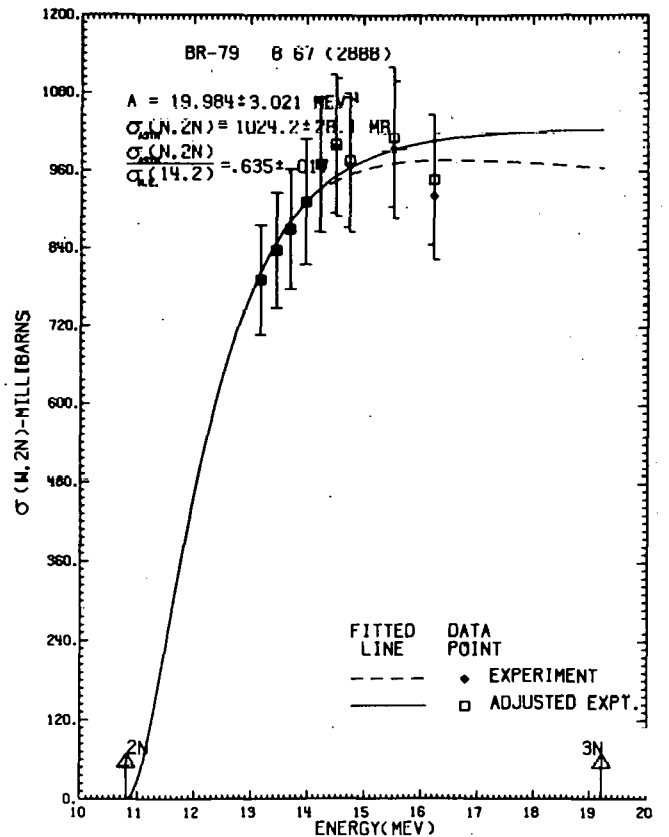
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1613.65 MB
 (N,2N) THRESHOLD = 10.83 MEV
 (N,3N) THRESHOLD = 19.22 MEV

THIS ISOTOPE HAS 44 NEUTRONS, 35 PROTONS, (MASS = 79)

NEUTRON EXCESS PARAMETER = .11392

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6347 PLUS-OR-MINUS .0174

N/SPACING = 2.202 A/SPACING = 3.953
 ERROR .333 ERROR .598

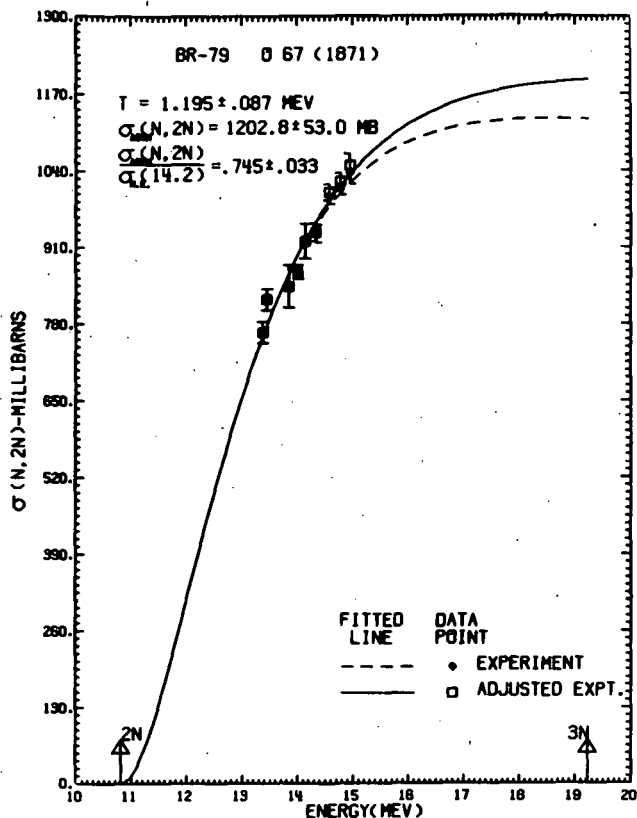


BR-79 ... FROM REF. 0 67 (1871)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.390	765.00	18.00	765.000	18.000	
13.460	821.00	18.00	821.000	18.000	
13.860	843.00	36.00	843.000	36.000	
14.020	868.00	12.00	868.000	12.000	
14.160	920.00	30.00	920.000	30.000	
14.350	933.00	15.00	935.151	15.035	
14.590	997.00	14.00	1002.883	14.083	
14.790	1013.00	14.00	1021.926	14.123	
14.960	1037.00	20.00	1048.640	20.224	

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.195 PLUS-OR-MINUS .087 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1202.84 PLUS-OR-MINUS 52.96 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1613.65 MB
 (N,2N) THRESHOLD = 10.83 MEV
 (N,3N) THRESHOLD = 19.22 MEV
 THIS ISOTOPE HAS 44 NEUTRONS, 35 PROTONS, (MASS = 79)
 NEUTRON EXCESS PARAMETER = .11392
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .7454 PLUS-OR-MINUS .0328
 T=SORT(N) = 7.927 ERROR .577 T=SORT(A) = 10.621 ERROR .773

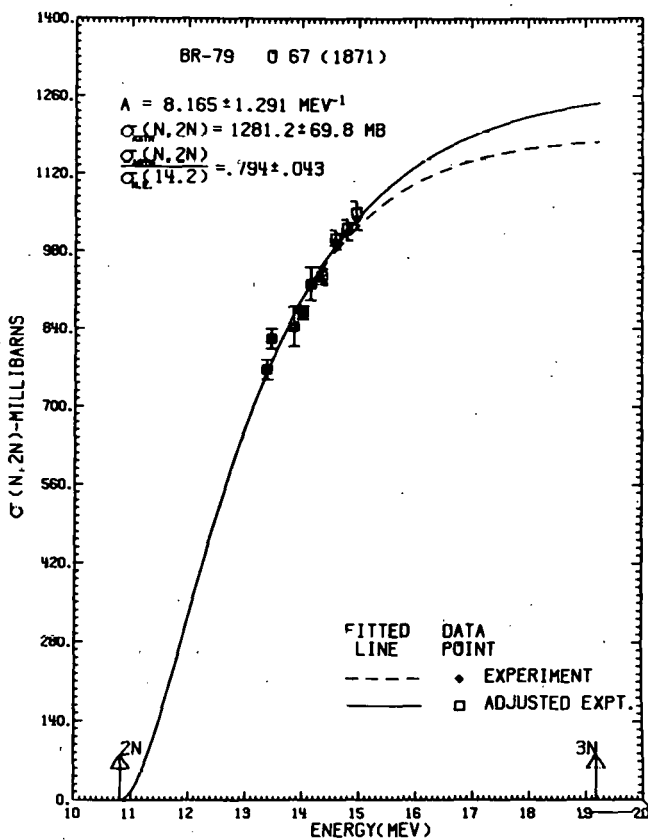


BR-79 ... FROM REF. 0 67 (1871)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.390	765.00	18.00	765.000	18.000	
13.460	821.00	18.00	821.000	18.000	
13.860	843.00	36.00	843.000	36.000	
14.020	868.00	12.00	868.000	12.000	
14.160	920.00	30.00	920.000	30.000	
14.350	933.00	15.00	935.151	15.035	
14.590	997.00	14.00	1002.883	14.083	
14.790	1013.00	14.00	1021.926	14.123	
14.960	1037.00	20.00	1048.640	20.224	

FITTED PARAMETERS
 LEVEL SPACING = 9.165 PLUS-OR-MINUS 1.291 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1281.20 PLUS-OR-MINUS 69.75 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1613.65 MB
 (N,2N) THRESHOLD = 10.83 MEV
 (N,3N) THRESHOLD = 19.22 MEV
 THIS ISOTOPE HAS 44 NEUTRONS, 35 PROTONS, (MASS = 79)
 NEUTRON EXCESS PARAMETER = .11392
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .7940 PLUS-OR-MINUS .0432
 N/SPACING = 5.389 ERROR .852 A/SPACING = 9.675 ERROR 1.530



BR-79 FROM REF. K 60 (770)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.250	330.00	40.00	330.000	40.000	
13.400	610.00	60.00	610.000	60.000	
14.200	815.00	80.00	815.000	80.000	
14.300	835.00	80.00	836.288	80.123	
15.700	900.00	80.00	919.008	81.690	
16.400	880.00	90.00	906.072	92.666	
17.450	990.00	80.00	926.475	83.279	
18.100	900.00	80.00	942.522	83.780	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.148 PLUS-OR-MINUS .051 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 971.90 PLUS-OR-MINUS 24.20 MB

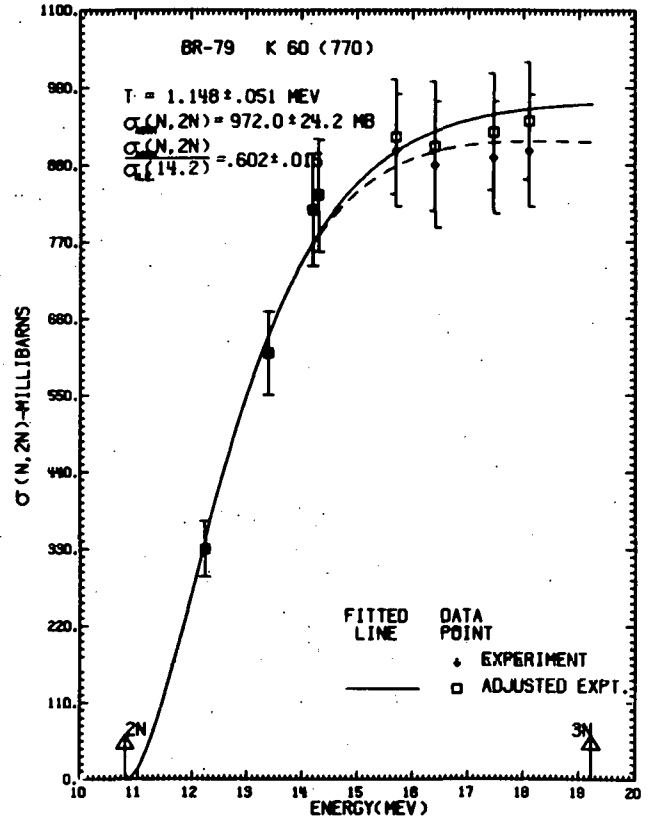
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1613.65 MB
 (N,2N) THRESHOLD = 10.83 MEV
 (N,3N) THRESHOLD = 19.22 MEV

THIS ISOTOPE HAS 44 NEUTRONS, 35 PROTONS, (MASS = 79)
 NEUTRON EXCESS PARAMETER = .11392

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6023 PLUS-OR-MINUS .0150

T*SQRT(N) = 7.615 T*SQRT(A) = 10.204
 ERROR .338 ERROR .453



BR-79 FROM REF. K 60 (770)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.250	330.00	40.00	330.000	40.000	
13.400	610.00	60.00	610.000	60.000	
14.200	815.00	80.00	815.000	80.000	
14.300	835.00	80.00	836.288	80.123	
15.700	900.00	80.00	919.008	81.690	
16.400	880.00	90.00	906.072	92.666	
17.450	990.00	80.00	926.475	83.279	
18.100	900.00	80.00	942.522	83.780	

FITTED PARAMETERS

LEVEL SPACING = 9.172 PLUS-OR-MINUS 1.072 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1006.19 PLUS-OR-MINUS 35.60 MB

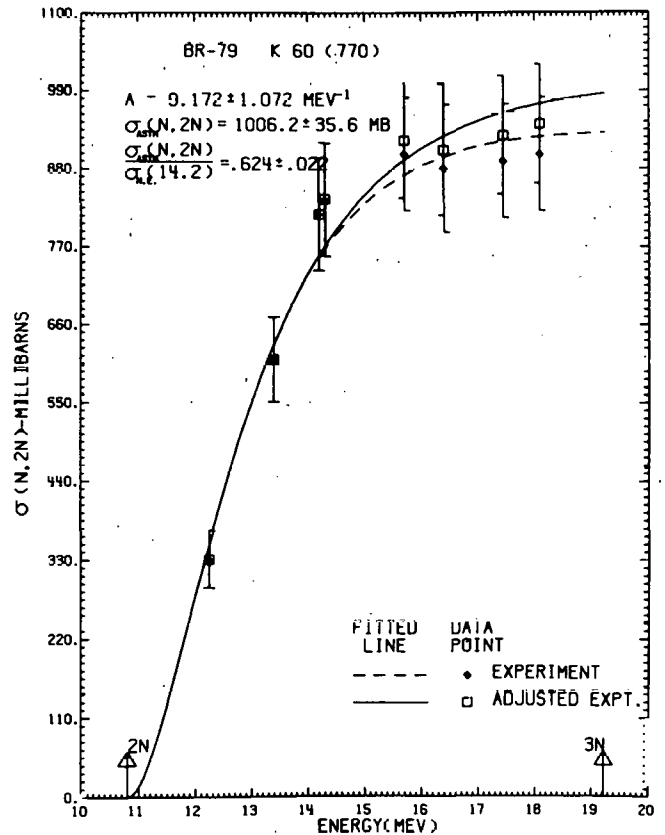
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1613.65 MB
 (N,2N) THRESHOLD = 10.83 MEV
 (N,3N) THRESHOLD = 19.22 MEV

THIS ISOTOPE HAS 44 NEUTRONS, 35 PROTONS, (MASS = 79)
 NEUTRON EXCESS PARAMETER = .11392

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6235 PLUS-OR-MINUS .0221

N/SPACING = 4.797 A/SPACING = 0.613
 ERROR .561 ERROR 1.007



BR-81 ... FROM REF. 0 67 (1871)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.390	596.00	21.00	596.000	21.000	
13.510	648.00	18.00	648.000	18.000	
13.640	667.00	19.00	667.000	19.000	
13.860	704.00	26.00	704.000	26.000	
14.270	715.00	27.00	715.758	27.029	
14.430	723.00	19.00	725.490	19.065	
14.590	766.00	24.00	770.426	24.139	
14.730	762.00	20.00	767.929	20.156	
14.860	814.00	22.00	821.819	22.211	
14.960	806.00	26.00	814.857	26.286	

FITTED PARAMETERS

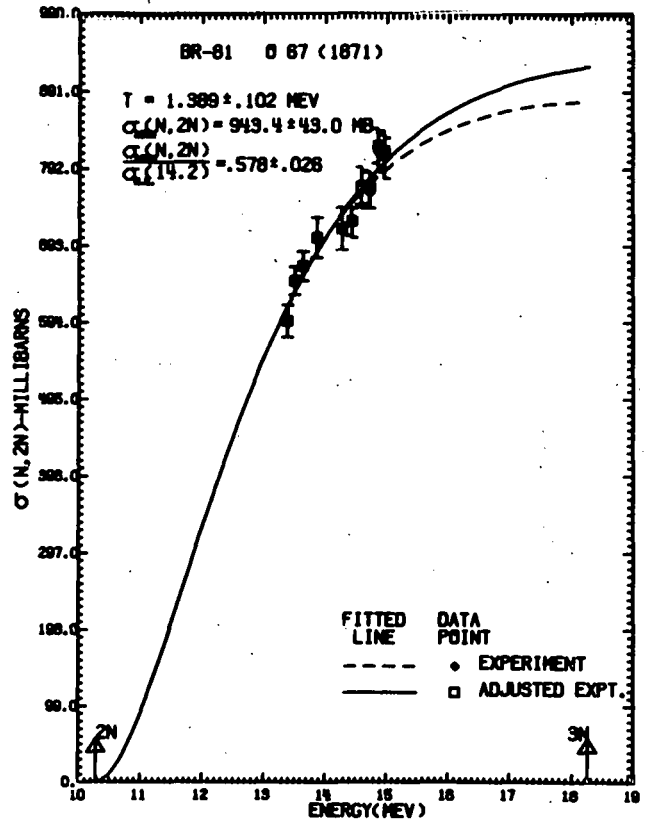
NUCLEAR TEMP. = 1.389 PLUS-OR-MINUS .102 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 943.41 PLUS-OR-MINUS 43.00 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1631.95 MB
 (N,2N) THRESHOLD = 10.29 MEV
 (N,3N) THRESHOLD = 18.27 MEV

THIS ISOTOPE HAS 46 NEUTRONS, 35 PROTONS, (MASS = 81)
 NEUTRON EXCESS PARAMETER = .13580
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5701 PLUS-OR-MINUS .0264

T=SQRT(N) = 9.421 T=SQRT(A) = 12.501
 ERROR .692 ERROR .918



BR-81 ... FROM REF. 0 67 (1871)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.390	596.00	21.00	596.000	21.000	
13.510	648.00	18.00	648.000	18.000	
13.640	667.00	19.00	667.000	19.000	
13.860	704.00	26.00	704.000	26.000	
14.270	715.00	27.00	715.758	27.029	
14.430	723.00	19.00	725.490	19.065	
14.590	766.00	24.00	770.426	24.139	
14.730	762.00	20.00	767.929	20.156	
14.860	814.00	22.00	821.819	22.211	
14.960	806.00	26.00	814.857	26.286	

FITTED PARAMETERS

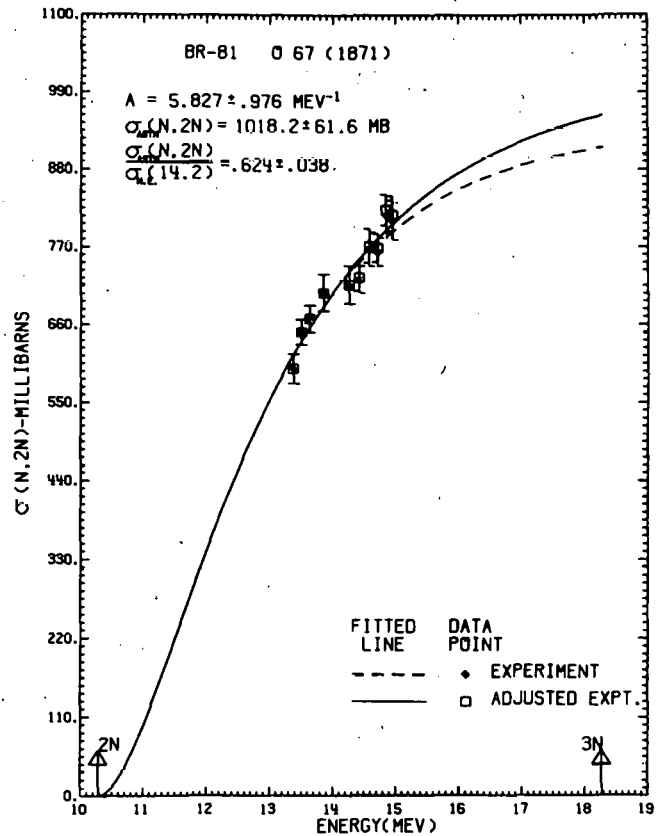
LEVEL SPACING = 5.827 PLUS-OR-MINUS .976 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1018.22 PLUS-OR-MINUS 61.58 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1631.95 MB
 (N,2N) THRESHOLD = 10.29 MEV
 (N,3N) THRESHOLD = 18.27 MEV

THIS ISOTOPE HAS 46 NEUTRONS, 35 PROTONS, (MASS = 81)
 NEUTRON EXCESS PARAMETER = .13580
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6239 PLUS-OR-MINUS .0377

N/SPACING = 7.894 A/SPACING = 13.901
 ERROR 1.322 ERROR 2.328

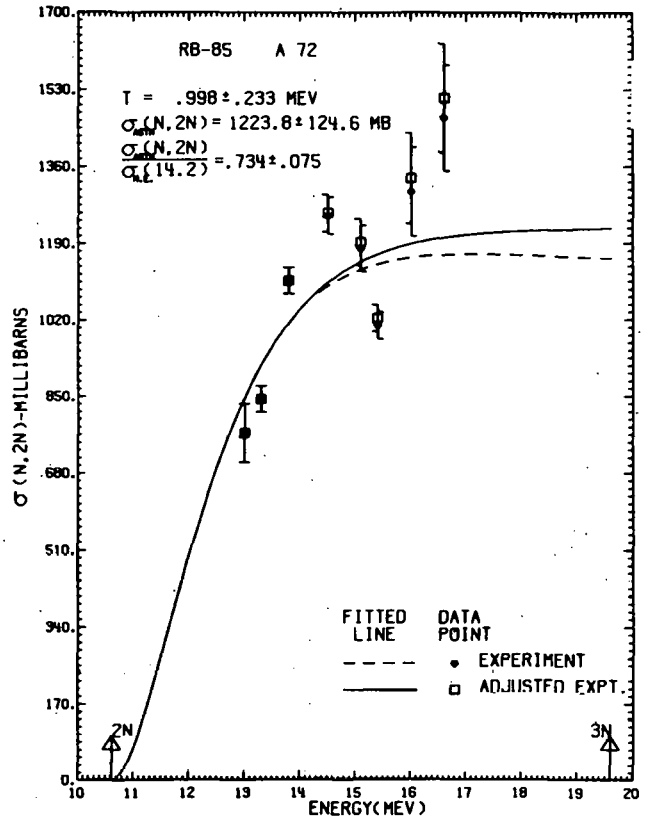


RB-85 ... FROM REF. A 72

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
13.000	768.00 65.00	768.000 65.000
13.300	844.00 29.00	844.000 29.000
13.800	1107.00 29.00	1107.000 29.000
14.500	1250.00 41.00	1255.364 41.176
15.100	1178.00 51.00	1192.558 51.630
15.400	1008.00 30.00	1024.277 30.484
16.000	1303.00 98.00	1333.323 100.281
16.600	1467.00 117.00	1510.754 120.490

FITTED PARAMETERS
 NUCLEAR TEMP. = .996 PLUS-OR-MINUS .233 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1223.80 PLUS-OR-MINUS 124.63 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1667.83 MB
 (N,2N) THRESHOLD = 10.61 MEV
 (N,3N) THRESHOLD = 19.59 MEV
 THIS ISOTOPE HAS 43 NEUTRONS, 37 PROTONS, (MASS = 80)
 NEUTRON EXCESS PARAMETER = .12941
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .7338 PLUS-OR-MINUS .0747
 T*SORT(N) = 6.214 T*SORT(A) = 9.201
 ERROR 1.614 ERROR 2.148

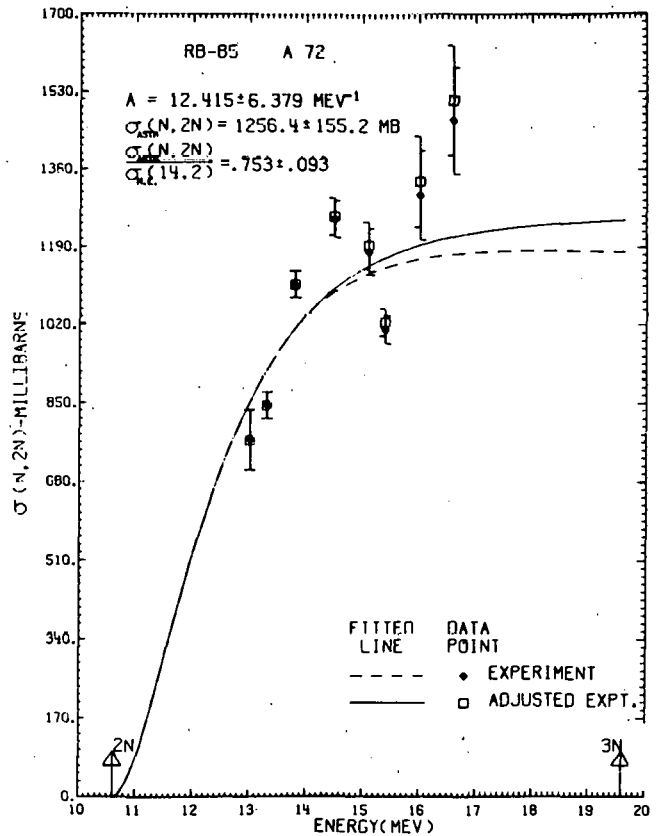


RB-85 ... FROM REF. A 72

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
13.000	768.00 65.00	768.000 65.000
13.300	844.00 29.00	844.000 29.000
13.800	1107.00 29.00	1107.000 29.000
14.500	1250.00 41.00	1255.364 41.176
15.100	1178.00 51.00	1192.558 51.630
15.400	1008.00 30.00	1024.277 30.484
16.000	1303.00 98.00	1333.323 100.281
16.600	1467.00 117.00	1510.754 120.490

FITTED PARAMETERS
 LEVEL SPACING = 17.415 PLUS-OR-MINUS 6.379 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1256.35 PLUS-OR-MINUS 155.24

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1667.83 MB
 (N,2N) THRESHOLD = 10.61 MEV
 (N,3N) THRESHOLD = 19.59 MEV
 THIS ISOTOPE HAS 46 NEUTRONS, 37 PROTONS, (MASS = 85)
 NEUTRON EXCESS PARAMETER = .12941
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .7531 PLUS-OR-MINUS .0931
 W/SPACING = 3.456 W/SPACING = 5.847
 ERROR 1.097 ERROR 3.518

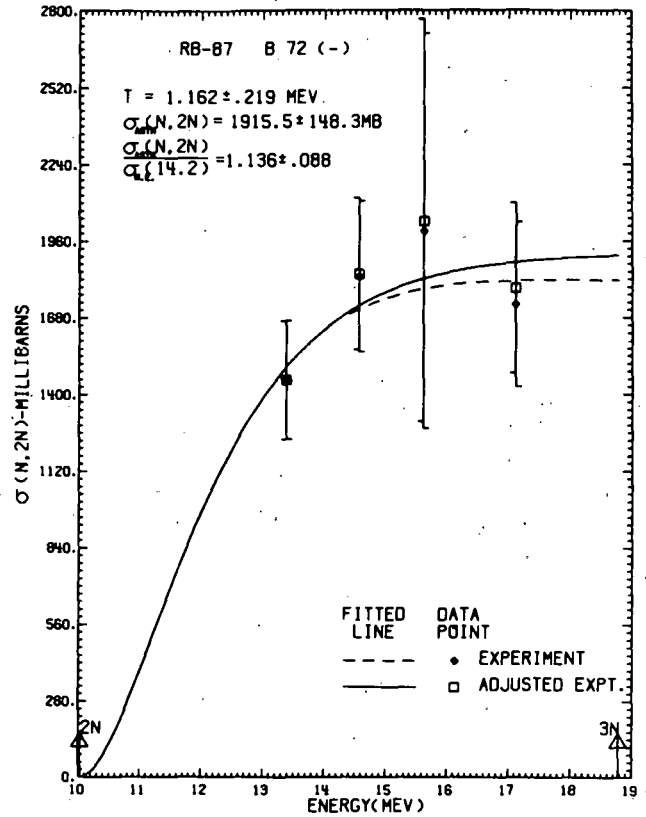


RB-87 FROM REF. B 72 (-)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.380	1453.00 217.00	1453.000 217.000	
14.560	1832.00 276.00	1841.204 277.387	
15.620	1998.00 720.00	2034.822 733.269	
17.120	1731.00 301.00	1790.348 311.320	

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.162 PLUS-MINUS .219 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1915.5 PLUS-MINUS 148.31 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1685.43 MB
 (N,2N) THRESHOLD = 10.03 MEV
 (N,3N) THRESHOLD = 18.76 MEV
 THIS ISOTOPE HAS 50 NEUTRONS, 37 PROTONS, (MASS = 87)
 NEUTRON EXCESS PARAMETER = .14943
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = 1.1365 PLUS-MINUS .0800
 T*SQRT(N) = 0.217 T*SQRT(A) = 10.838
 ERROR 1.549 ERROR 2.043

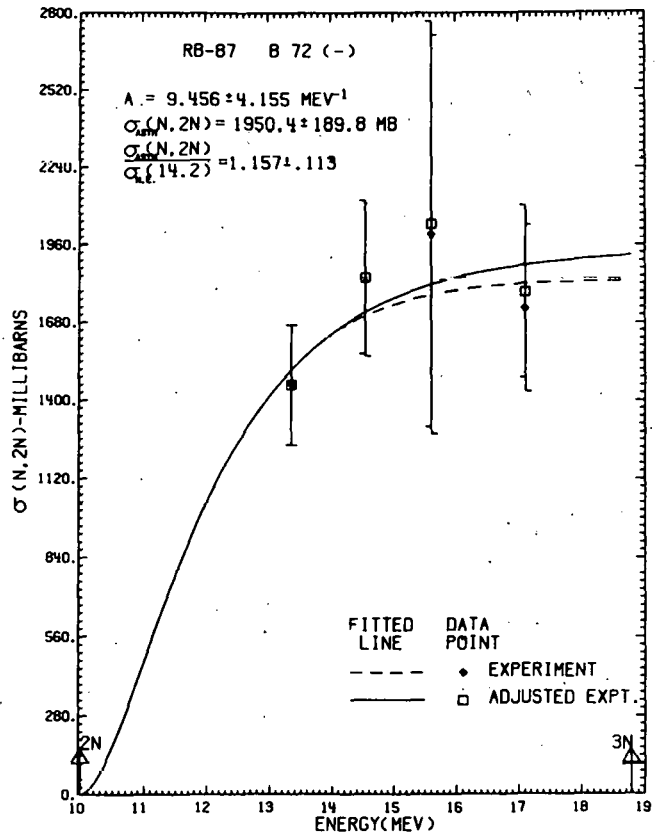


RB-87 FROM REF. B 72 (-)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.380	1453.00 217.00	1453.000 217.000	
14.560	1832.00 276.00	1841.204 277.387	
15.620	1998.00 720.00	2034.822 733.269	
17.120	1731.00 301.00	1790.348 311.320	

FITTED PARAMETERS
 LEVEL SPACING = 9.456 PLUS-MINUS 4.155 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1950.4 PLUS-MINUS 189.78 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1685.43 MB
 (N,2N) THRESHOLD = 10.03 MEV
 (N,3N) THRESHOLD = 18.78 MEV
 THIS ISOTOPE HAS 50 NEUTRONS, 37 PROTONS, (MASS = 87)
 NEUTRON EXCESS PARAMETER = .14943
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = 1.1572 PLUS-MINUS .1126
 N/SPACING = 5.288 A/SPACING = 9.201
 ERROR 2.323 ERROR 4.043



RB-85 ... FROM REF. B 67 (2888)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR	MEASURED, ERR	ADJUSTED, ERR
12.940	738.00 59.00	738.000 59.000	738.000 59.000	738.000 59.000
13.510	887.00 71.00	887.000 71.000	887.000 71.000	887.000 71.000
14.100	964.00 58.00	964.000 58.000	964.000 58.000	964.000 58.000
14.880	1174.00 94.00	1185.126 94.891	1185.126 94.891	1185.126 94.891
15.620	1170.00 93.00	1192.030 94.751	1192.030 94.751	1192.030 94.751
16.310	1160.00 93.00	1191.002 95.486	1191.002 95.486	1191.002 95.486
17.230	1196.00 96.00	1239.221 99.469	1239.221 99.469	1239.221 99.469
18.020	1166.00 93.00	1216.486 97.027	1216.486 97.027	1216.486 97.027
18.890	1114.00 89.00	1170.030 93.476	1170.030 93.476	1170.030 93.476
19.580	1127.00 90.00	1189.260 94.972	1189.260 94.972	1189.260 94.972

FITTED PARAMETERS

NUCLEAR TEMP. = 1.142 PLUS-OR-MINUS .049 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1230.20 PLUS-OR-MINUS 23.52 MB

RELATED DATA

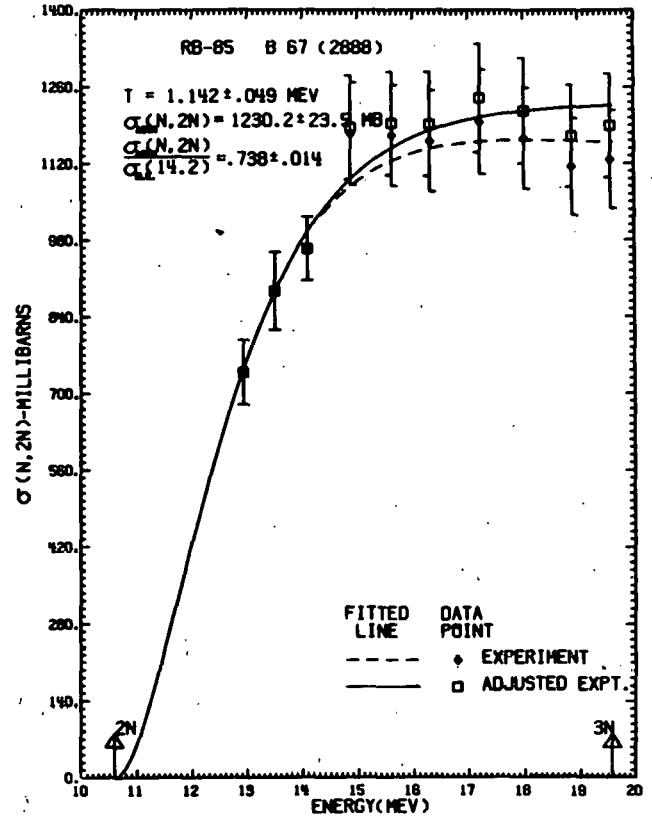
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1667.83 MB
 (N,2N) THRESHOLD = 10.61 MEV
 (N,3N) THRESHOLD = 19.59 MEV

THIS ISOTOPE HAS 48 NEUTRONS, 37 PROTONS, (MASS = 85)

NEUTRON EXCESS PARAMETER = .12941

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7376 PLUS-OR-MINUS .0141

1/SORT(N) = 7.912 1/SORT(I) = 10.528
 ERROR .339 ERROR .452



RB-85 ... FROM REF. B 67 (2888)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR	MEASURED, ERR	ADJUSTED, ERR
12.940	738.00 59.00	738.000 59.000	738.000 59.000	738.000 59.000
13.510	887.00 71.00	887.000 71.000	887.000 71.000	887.000 71.000
14.100	964.00 58.00	964.000 58.000	964.000 58.000	964.000 58.000
14.880	1174.00 94.00	1185.126 94.891	1185.126 94.891	1185.126 94.891
15.620	1170.00 93.00	1192.030 94.751	1192.030 94.751	1192.030 94.751
16.310	1160.00 93.00	1191.002 95.486	1191.002 95.486	1191.002 95.486
17.230	1196.00 96.00	1239.221 99.469	1239.221 99.469	1239.221 99.469
18.020	1166.00 93.00	1216.486 97.027	1216.486 97.027	1216.486 97.027
18.890	1114.00 89.00	1170.030 93.476	1170.030 93.476	1170.030 93.476
19.580	1127.00 90.00	1189.260 94.972	1189.260 94.972	1189.260 94.972

FITTED PARAMETERS

LEVEL SPACING = 9.897 PLUS-OR-MINUS 1.029 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1252.28 PLUS-OR-MINUS 30.55 MB

RELATED DATA

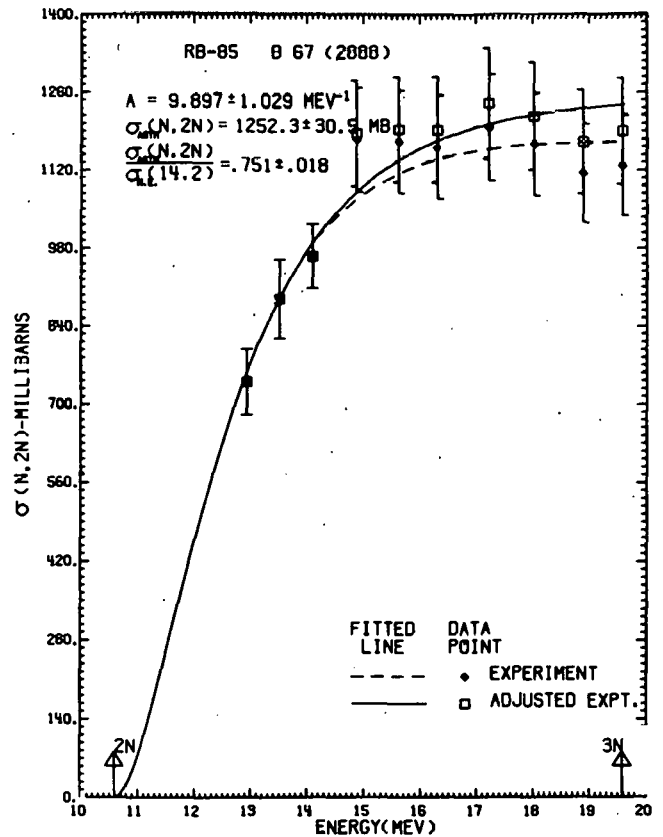
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1667.83 MB
 (N,2N) THRESHOLD = 10.61 MEV
 (N,3N) THRESHOLD = 19.59 MEV

THIS ISOTOPE HAS 48 NEUTRONS, 37 PROTONS, (MASS = 85)

NEUTRON EXCESS PARAMETER = .12941

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7508 PLUS-OR-MINUS .0183

N/SPACING = 4.850 A/SPACING = 8.588
 ERROR .504 ERROR .893

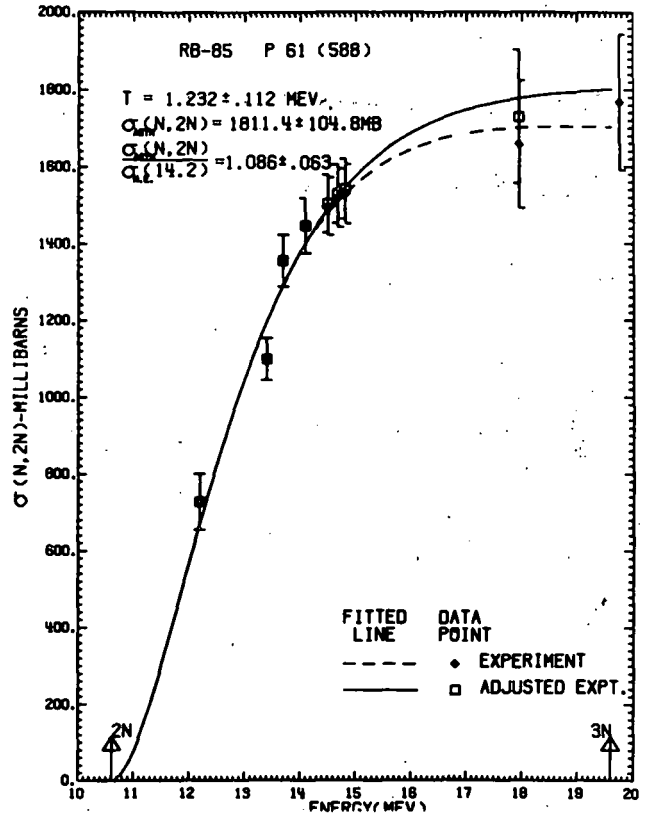


RB-85 FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.200	726.00	73.00	726.000	73.000
13.400	1099.00	55.00	1099.000	55.000
13.690	1356.00	68.00	1356.000	68.000
14.090	1447.00	72.00	1447.000	72.000
14.300	1498.00	75.00	1504.428	75.322
14.640	1520.00	76.00	1530.308	76.515
14.810	1530.00	77.00	1543.070	77.658
17.950	1659.00	166.00	1720.833	173.088

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.232 PLUS-OR-MINUS .112 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1811.36 PLUS-OR-MINUS 104.84 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1667.83 MB
 (N,2N) THRESHOLD = 10.61 MEV
 (N,3N) THRESHOLD = 19.59 MEV
 THIS ISOTOPE HAS 48 NEUTRONS, 37 PROTONS, (MASS = 85)
 NEUTRON EXCESS PARAMETER = .12941
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = 1.0861 PLUS-OR-MINUS .0629
 T*SQRT(N) = 8.536 ERROR .776
 T*SQRT(A) = 11.398 ERROR 1.033

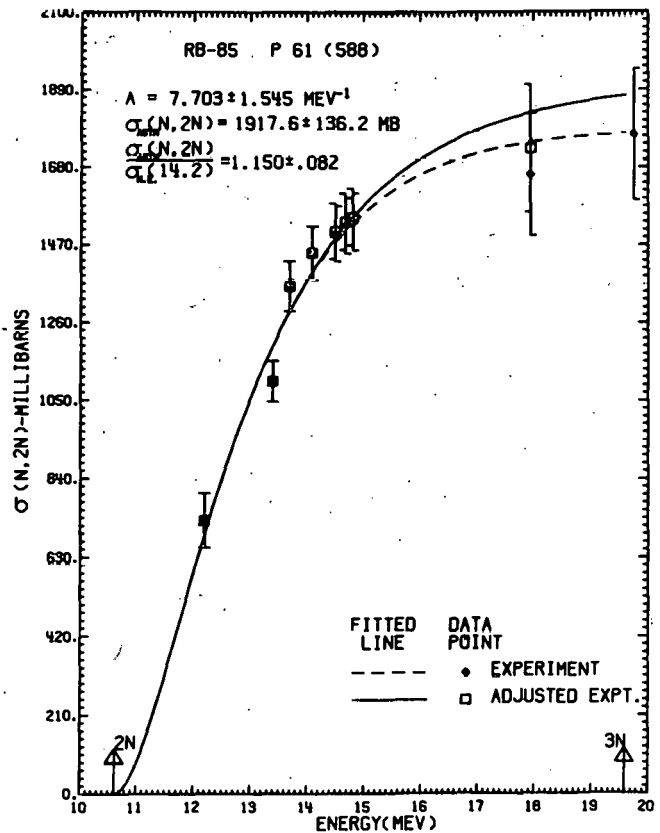


RB-85 FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.200	726.00	73.00	726.000	73.000
13.400	1099.00	55.00	1099.000	55.000
13.690	1356.00	68.00	1356.000	68.000
14.090	1447.00	72.00	1447.000	72.000
14.300	1498.00	75.00	1504.428	75.322
14.640	1520.00	76.00	1530.308	76.515
14.810	1530.00	77.00	1543.070	77.658
17.950	1659.00	166.00	1720.833	173.088

FITTED PARAMETERS
 LEVEL SPACING = 7.703 PLUS-OR-MINUS 1.545 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1917.64 PLUS-OR-MINUS 136.23 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1667.83 MB
 (N,2N) THRESHOLD = 10.61 MEV
 (N,3N) THRESHOLD = 19.59 MEV
 THIS ISOTOPE HAS 48 NEUTRONS, 37 PROTONS, (MASS = 85)
 NEUTRON EXCESS PARAMETER = .12941
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = 1.1498 PLUS-OR-MINUS .0817
 N/SPACING = 6.231 ERROR 1.250
 A/SPACING = 11.035 ERROR 2.213

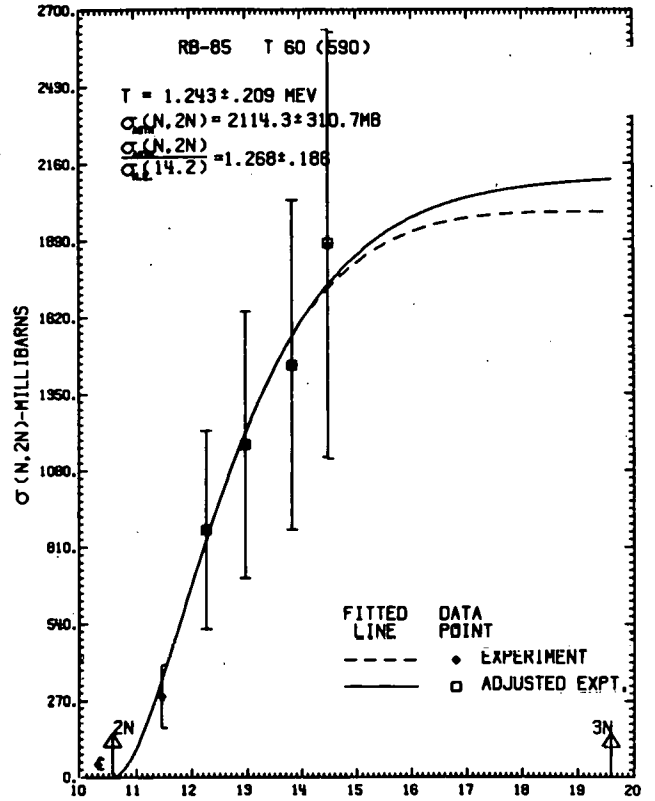


RB-85 ...FROM REF. T 60 (590)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ERR	ADJUSTED	ERR
12,300	870.00	350.00	870.000	350.000	
13,000	1170.00	470.00	1170.000	470.000	
13,850	1450.00	580.00	1450.000	580.000	
14,500	1870.00	750.00	1878.024	753.218	

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.243 PLUS-OR-MINUS .209 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2114.26 PLUS-OR-MINUS 310.72 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1667.83 MB
 (N,2N) THRESHOLD = 10.61 MEV
 (N,3N) THRESHOLD = 19.59 MEV
 THIS ISOTOPE HAS 48 NEUTRONS, 37 PROTONS, (MASS = 85)
 NEUTRON EXCESS PARAMETER = .12941
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.2677 PLUS-OR-MINUS .1863
 T=SQRT(N) = 8.612 T=SQRT(A) = 11.460
 ERROR 1.448 ERROR 1.927

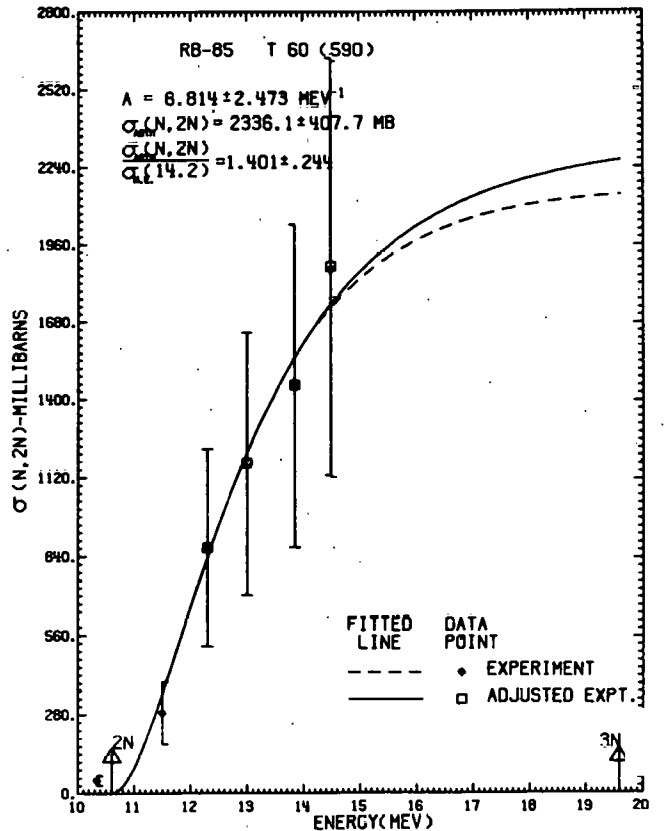


RB-85 ...FROM REF. T 60 (590)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ERR	ADJUSTED	ERR
12,300	870.00	350.00	870.000	350.000	
13,000	1170.00	470.00	1170.000	470.000	
13,850	1450.00	580.00	1490.000	580.000	
14,500	1870.00	750.00	1878.024	753.218	

FITTED PARAMETERS
 LEVEL SPACING = 6.814 PLUS-OR-MINUS 2.473 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2336.10 PLUS-OR-MINUS 407.71 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1667.83 MB
 (N,2N) THRESHOLD = 10.61 MEV
 (N,3N) THRESHOLD = 19.59 MEV
 THIS ISOTOPE HAS 48 NEUTRONS, 37 PROTONS, (MASS = 85)
 NEUTRON EXCESS PARAMETER = .12941
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.4007 PLUS-OR-MINUS .2445
 N/SPACING = 7.044 A/SPACING = 12.474
 ERROR 2.557 ERROR 4.527



RB-87 ... FROM REF. A 72

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.300	1090.00 86.00	1090.000 86.000	
13.800	1127.00 92.00	1127.000 92.000	
14.500	1307.00 78.00	1312.495 78.328	
15.100	1126.00 112.00	1139.626 113.395	
15.400	1176.00 102.00	1194.591 103.612	

FITTED PARAMETERS

NUCLEAR TEMP. = .904 PLUS-OR-MINUS .274 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1261.31 PLUS-OR-MINUS 95.11 MB

RELATED DATA

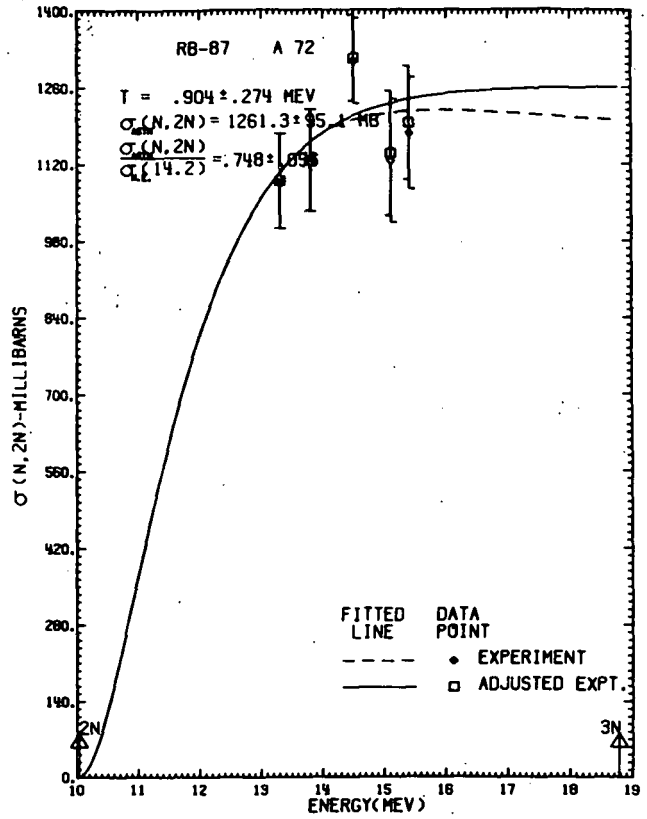
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1685.43 MB
 (N,2N) THRESHOLD = 10.93 MEV
 (N,3N) THRESHOLD = 18.78 MEV

THIS ISOTOPE HAS 50 NEUTRONS, 37 PROTONS, (MASS = 87)

NEUTRON EXCESS PARAMETER = .14943

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7484 PLUS-OR-MINUS .0564

Y*SORT(N) = 6.392 Y*SORT(A) = 8.432
 ERROR 1.937 ERROR 2.556



RB-87 ... FROM REF. A 72

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.300	1090.00 86.00	1090.000 86.000	
13.800	1127.00 92.00	1127.000 92.000	
14.500	1307.00 78.00	1312.495 78.328	
15.100	1126.00 112.00	1139.626 113.395	
15.400	1176.00 102.00	1194.591 103.612	

FITTED PARAMETERS

LEVEL SPACING = 15.563 PLUS-OR-MINUS 10.3 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1276.09 PLUS-OR-MINUS 117.31 MB

RELATED DATA

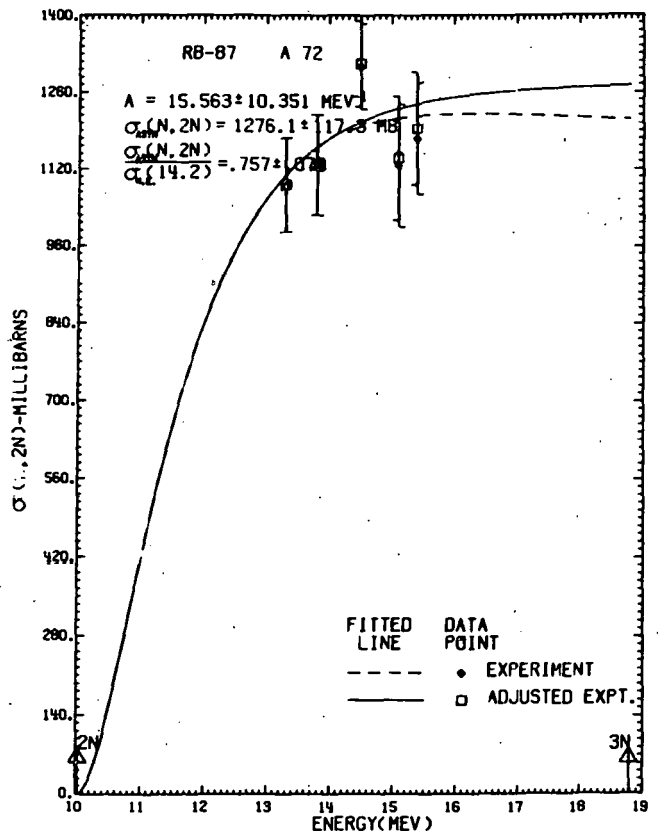
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1685.43 MB
 (N,2N) THRESHOLD = 10.93 MEV
 (N,3N) THRESHOLD = 18.78 MEV

THIS ISOTOPE HAS 50 NEUTRONS, 37 PROTONS, (MASS = 87)

NEUTRON EXCESS PARAMETER = .14943

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7571 PLUS-OR-MINUS .0696

N/SPACING = 3.213 A/SPACING = 9.590
 ERROR 2.117 ERROR 3.718



RB-85 ...FROM REF. B 72 (-)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR	ADJUSTED	ERR
13.380	846.20	60.90	846.200	60.900
14.560	1093.30	78.70	1098.906	79.104
15.620	1108.70	85.40	1129.576	87.008
16.410	1131.80	81.50	1163.274	83.766
17.120	1121.60	80.80	1160.941	83.634
18.120	1101.50	78.20	1150.129	81.652

FITTED PARAMETERS

NUCLEAR TEMP. = 1.070 PLUS-OR-MINUS .057 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1186.80 PLUS-OR-MINUS 21.84 MB

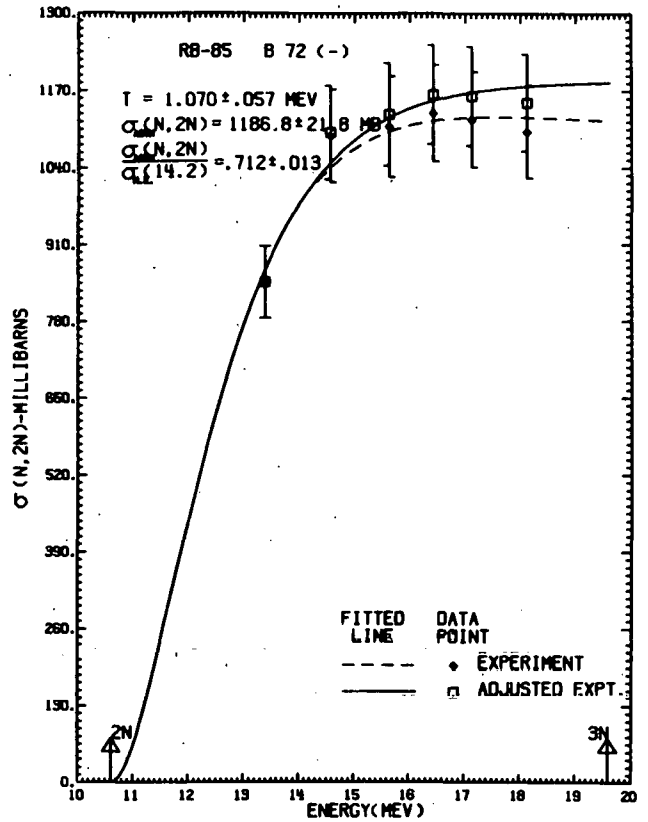
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1667.83 MB
 (N,2N) THRESHOLD = 10.61 MEV
 (N,3N) THRESHOLD = 19.59 MEV

THIS ISOTOPE HAS 48 NEUTRONS, 37 PROTONS, (MASS = 85)
 NEUTRON EXCESS PARAMETER = .12941

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7116 PLUS-OR-MINUS .0131

T=SQRT(N) = 7.413 T=SQRT(A) = 9.665
 ERROR .395 ERROR .526



RB-85 ...FROM REF. B 72 (-)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR	ADJUSTED	ERR
13.380	846.20	60.90	846.200	60.900
14.560	1093.30	78.70	1098.906	79.104
15.620	1108.70	85.40	1129.576	87.008
16.410	1131.80	81.50	1163.274	83.766
17.120	1121.60	80.80	1160.941	83.634
18.120	1101.50	78.20	1150.129	81.652

FITTED PARAMETERS

LEVEL SPACING = 11.340 PLUS-OR-MINUS 1.536 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1206.70 PLUS-OR-MINUS 30.57 MB

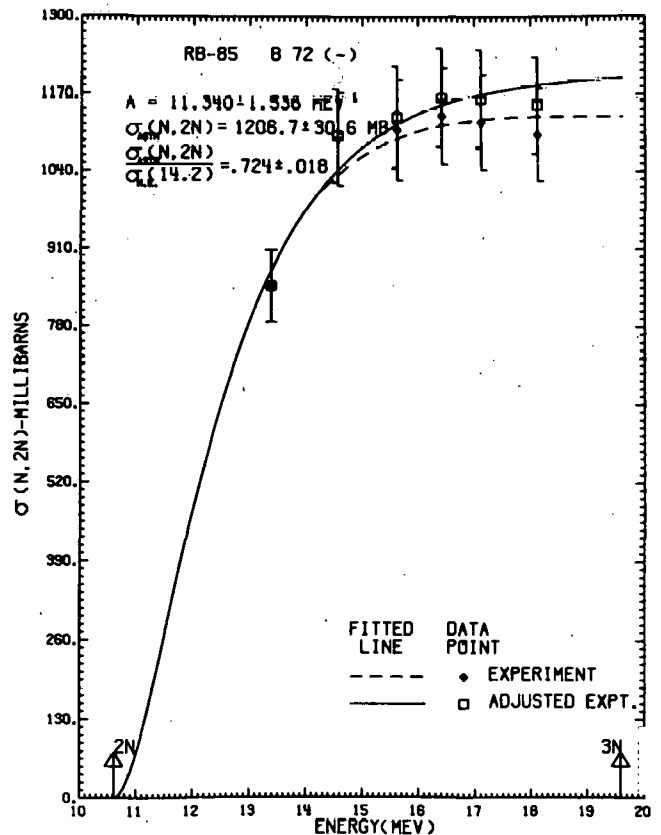
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1667.83 MB
 (N,2N) THRESHOLD = 10.61 MEV
 (N,3N) THRESHOLD = 19.59 MEV

THIS ISOTOPE HAS 48 NEUTRONS, 37 PROTONS, (MASS = 85)
 NEUTRON EXCESS PARAMETER = .12941

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7235 PLUS-OR-MINUS .0183

N/SPACING = 4.233 A/SPACING = 7.496
 ERROR .573 ERROR 1.015



RB-87 ...FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.200	700.00	70.00	700.000	70.000
13.400	1056.00	53.00	1056.000	53.000
13.690	1107.00	55.00	1107.000	55.000
14.090	1170.00	59.00	1170.000	59.000
14.500	1211.00	61.00	1216.091	61.256
14.680	1194.00	60.00	1201.932	60.399
14.810	1191.00	60.00	1200.965	60.502
17.950	1141.00	114.00	1188.583	118.754

FITTED PARAMETERS

NUCLEAR TEMP. = 1.125 PLUS-OR-MINUS .074 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1311.06 PLUS-OR-MINUS 37.59 MB

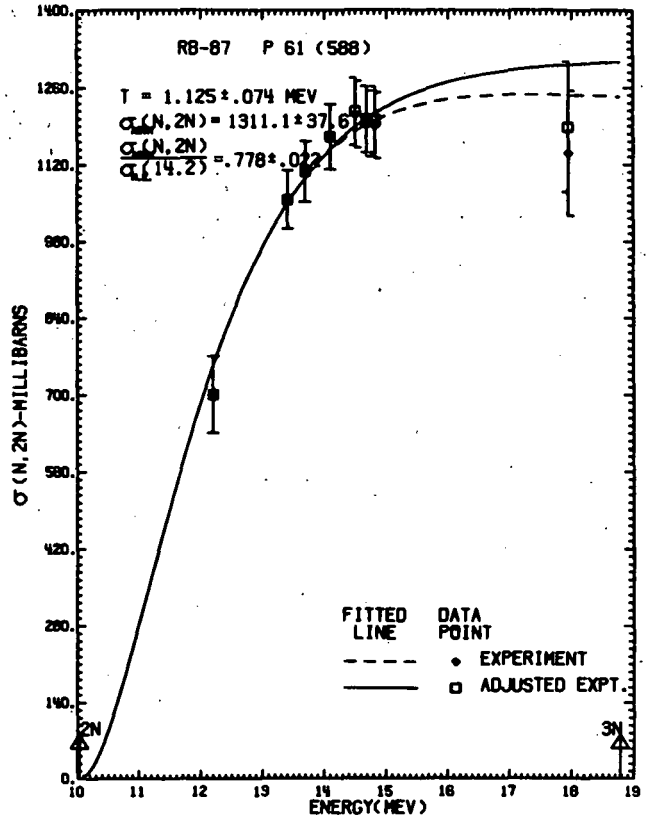
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1685.43 MB
 (N,2N) THRESHOLD = 10.03 MEV
 (N,3N) THRESHOLD = 18.78 MEV

THIS ISOTOPE HAS 50 NEUTRONS, 37 PROTONS, (MASS = 87)
 NEUTRON EXCESS PARAMETER = .14943

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7779 PLUS-OR-MINUS .0223

T*SQRT(N) = 7.955 T*SQRT(A) = 10.493
 ERROR .523 ERROR .690



RB-87 ...FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.200	700.00	70.00	700.000	70.000
13.400	1056.00	53.00	1056.000	53.000
13.690	1107.00	55.00	1107.000	55.000
14.090	1170.00	59.00	1170.000	59.000
14.500	1211.00	61.00	1216.091	61.256
14.680	1194.00	60.00	1201.932	60.399
14.810	1191.00	60.00	1200.965	60.502
17.950	1141.00	114.00	1188.583	118.754

FITTED PARAMETERS

LEVEL SPACING = 9.404 PLUS-OR-MINUS 1.631 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1355.66 PLUS-OR-MINUS 58.18 MB

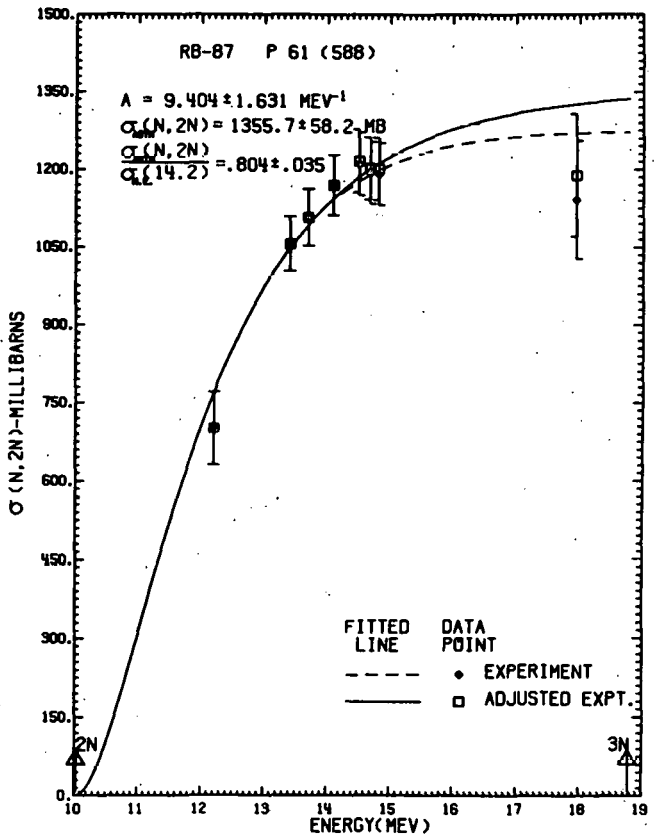
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1685.43 MB
 (N,2N) THRESHOLD = 10.03 MEV
 (N,3N) THRESHOLD = 18.78 MEV

THIS ISOTOPE HAS 50 NEUTRONS, 37 PROTONS, (MASS = 87)
 NEUTRON EXCESS PARAMETER = .14943

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8043 PLUS-OR-MINUS .0345

N/SPACING = 5.317 A/SPACING = 9.251
 ERROR .922 ERROR 1.605



RB'87 ... FROM REF. T 60 (590)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR		
11.500	1010.00	400.00	1010.000	400.000
12.300	1470.00	590.00	1470.000	590.000
13.000	1760.00	700.00	1760.000	700.000
13.850	2085.00	830.00	2085.000	830.000
14.500	2430.00	970.00	2440.216	974.078

FITTED PARAMETERS

NUCLEAR TEMP. = 1.091 PLUS-OR-MINUS .103 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2464.79 PLUS-OR-MINUS 176.46 MB

RELATED DATA

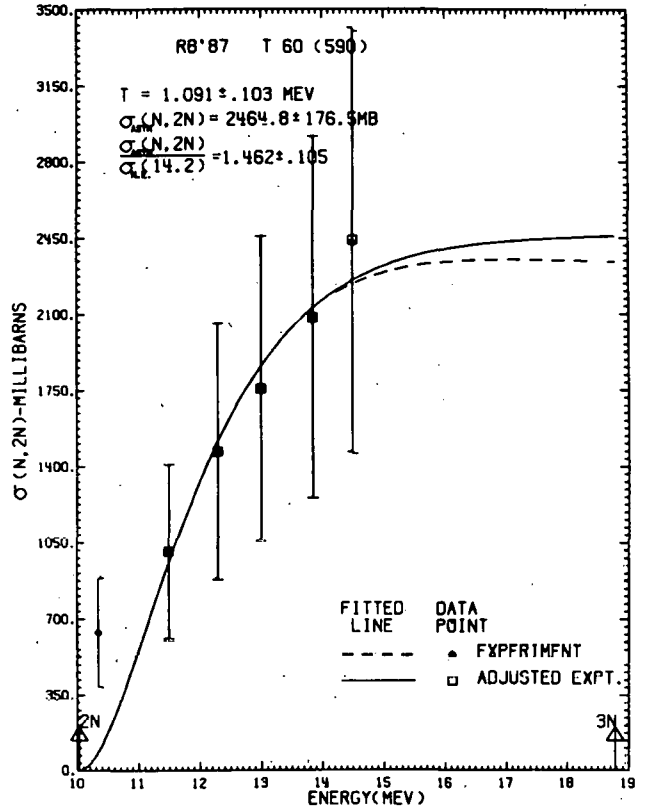
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1685.43 MB
 (N,2N) THRESHOLD = 10.03 MEV
 (N,3N) THRESHOLD = 18.78 MEV

THIS ISOTOPE HAS 50 NEUTRONS, 37 PROTONS, (MASS = 87)

NEUTRON EXCESS PARAMETER = .14943

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.4624 PLUS-OR-MINUS .1047

T=SQRT(A) = 7.715 T=SQRT(A) = 10.176
 ERROR .728 ERROR .961



RB'87 ... FROM REF. T 60 (590)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR		
11.500	1010.00	400.00	1010.000	400.000
12.300	1470.00	590.00	1470.000	590.000
13.000	1760.00	700.00	1760.000	700.000
13.850	2085.00	830.00	2085.000	830.000
14.500	2430.00	970.00	2440.216	974.078

FITTED PARAMETERS

LEVEL SPACING = 8.715 PLUS-OR-MINUS 1.596 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2647.12 PLUS-OR-MINUS 202.18 MB

RELATED DATA

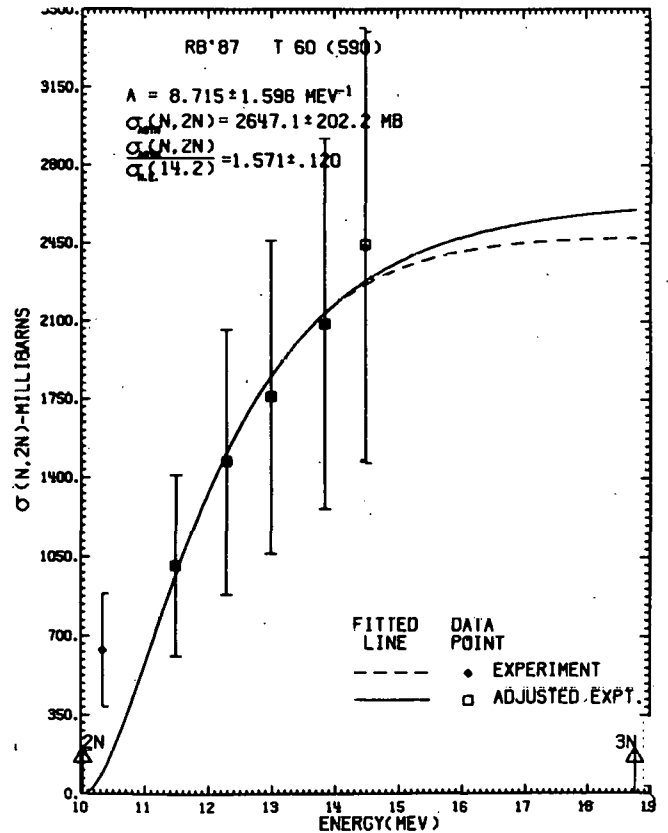
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1685.43 MB
 (N,2N) THRESHOLD = 10.03 MEV
 (N,3N) THRESHOLD = 18.78 MEV

THIS ISOTOPE HAS 50 NEUTRONS, 37 PROTONS, (MASS = 87)

NEUTRON EXCESS PARAMETER = .14943

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.5706 PLUS-OR-MINUS .1200

N/SPACING = 5.737 A/SPACING = 9.983
 ERROR 1.051 ERROR 1.828

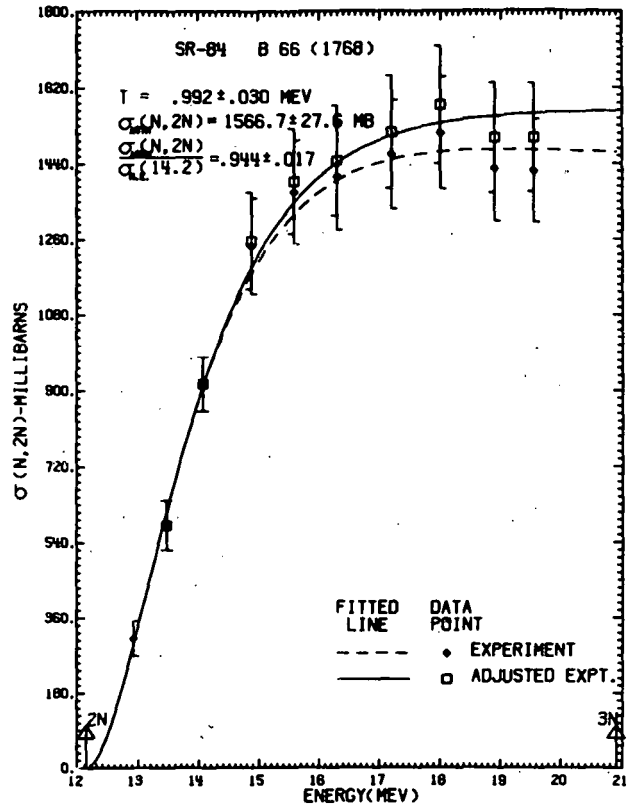


SR-84 ... FROM REF. B 66 (1768)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.500	581.00	59.00	581.000	59.000	
14.100	917.00	65.00	917.000	65.000	
14.900	1244.00	114.00	1256.248	115.122	
15.600	1372.00	123.00	1397.780	129.311	
16.300	1409.00	127.00	1446.921	130.418	
17.200	1462.00	129.00	1515.018	133.678	
18.000	1513.00	133.00	1579.027	138.804	
18.900	1429.00	124.00	1501.867	130.323	
19.550	1423.00	122.00	1502.308	128.799	

FITTED PARAMETERS
 NUCLEAR TEMP. = .992 PLUS-OR-MINUS .030 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1566.71 PLUS-OR-MINUS 27.62 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1658.94 MB
 (N,2N) THRESHOLD = 12.16 MEV
 (N,3N) THRESHOLD = 20.90 MEV
 THIS ISOTOPE HAS 46 NEUTRONS, 38 PROTONS, (MASS = 84)
 NEUTRON EXCESS PARAMETER = .09524
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .9444 PLUS-OR-MINUS .0167
 T*SQRT(N) = 6.728 T*SQRT(A) = 9.092
 ERROR .203 ERROR .273

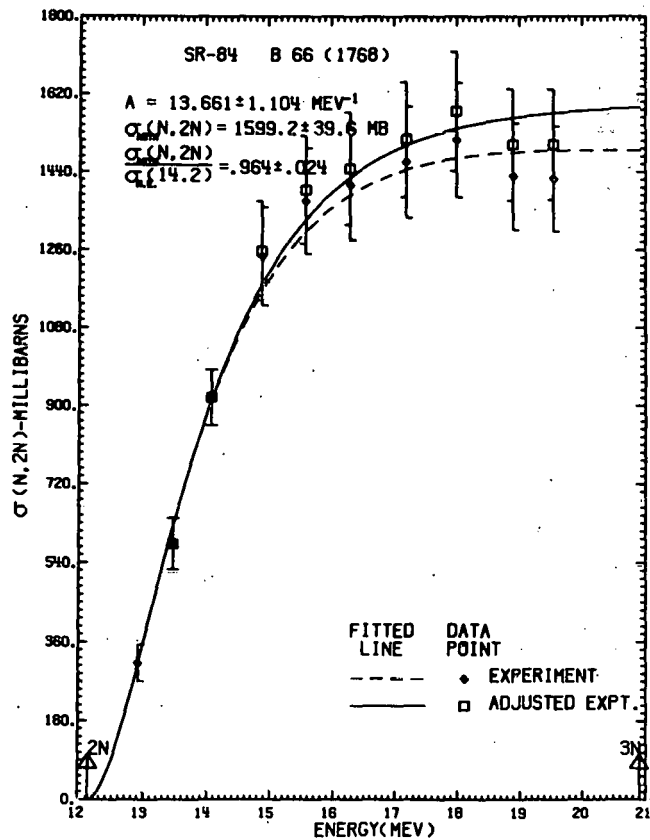


SR-84 ... FROM REF. B 66 (1768)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.500	581.00	59.00	581.000	59.000	
14.100	917.00	65.00	917.000	65.000	
14.900	1244.00	114.00	1256.248	115.122	
15.600	1372.00	123.00	1397.780	129.311	
16.300	1409.00	127.00	1446.921	130.418	
17.200	1462.00	129.00	1515.018	133.678	
18.000	1513.00	133.00	1579.027	138.804	
18.900	1429.00	124.00	1501.867	130.323	
19.550	1423.00	122.00	1502.308	128.799	

FITTED PARAMETERS
 LEVEL SPACING = 13.661 PLUS-OR-MINUS 1.104 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1599.16 PLUS-OR-MINUS 39.57 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1658.94 MB
 (N,2N) THRESHOLD = 12.16 MEV
 (N,3N) THRESHOLD = 20.90 MEV
 THIS ISOTOPE HAS 46 NEUTRONS, 38 PROTONS, (MASS = 84)
 NEUTRON EXCESS PARAMETER = .09524
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .9640 PLUS-OR-MINUS .0239
 N/SPACING = 3.367 A/SPACING = 6.149
 ERROR .272 ERROR .497



SR-84 ...FROM REF. P 61 (588)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR	MEASURED, ERR	ADJUSTED, ERR
13.400	84.30 4.20	84.300 4.200		
13.690	111.10 5.60	111.100 5.600		
13.860	115.90 5.80	115.900 5.800		
14.090	142.40 7.10	142.400 7.100		
14.310	149.90 7.50	150.141 7.512		
14.500	171.70 8.60	172.444 8.637		
14.930	180.60 9.00	182.451 9.092		
16.500	230.00 33.00	236.692 33.900		
17.950	351.00 35.00	366.164 36.512		
19.760	295.00 30.00	311.865 31.715		

FITTED PARAMETERS

NUCLEAR TEMP. = 1.232 PLUS-MINUS .096 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 299.43 PLUS-MINUS 25.56 MB

RELATED DATA

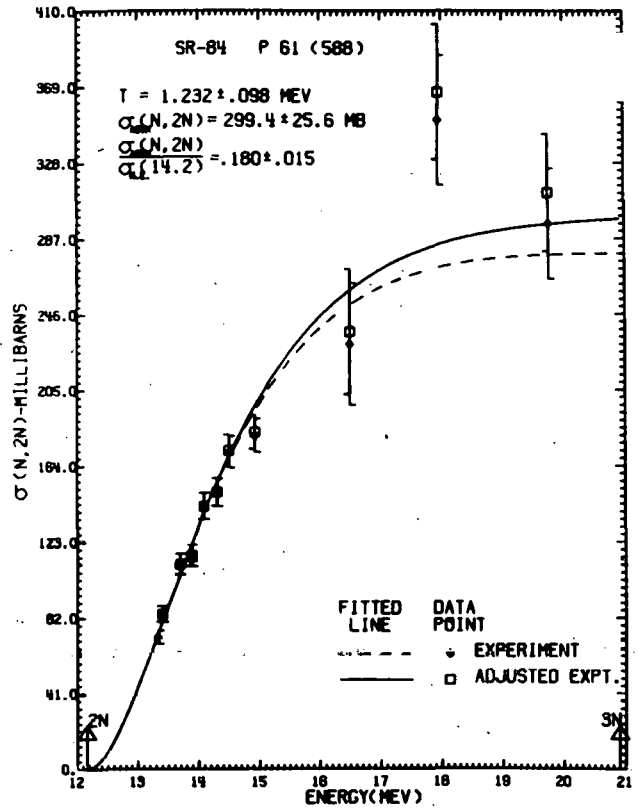
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1658.94 MB
 (N,2N) THRESHOLD = 12.16 MEV
 (N,3N) THRESHOLD = 20.90 MEV

THIS ISOTOPE HAS 46 NEUTRONS, 38 PROTONS, (MASS = 84)

NEUTRON EXCESS PARAMETER = .09524

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .1805 PLUS-MINUS .0154

1/SPACING = 6.350 T-SPACING = 11.291
 ERROR .465 ERROR .898



SR-84 ...FROM REF. P 61 (588)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR	MEASURED, ERR	ADJUSTED, ERR
13.400	84.30 4.20	84.300 4.200		
13.690	111.10 5.60	111.100 5.600		
13.860	115.90 5.80	115.900 5.800		
14.090	142.40 7.10	142.400 7.100		
14.310	149.90 7.50	150.141 7.512		
14.500	171.70 8.60	172.444 8.637		
14.930	180.60 9.00	182.451 9.092		
16.500	230.00 33.00	236.692 33.960		
17.950	351.00 35.00	366.164 36.512		
19.760	295.00 30.00	311.865 31.715		

FITTED PARAMETERS

LEVEL SPACING = 8.170 PLUS-MINUS 1.268 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 320.93 PLUS-MINUS 27.63 MB

RELATED DATA

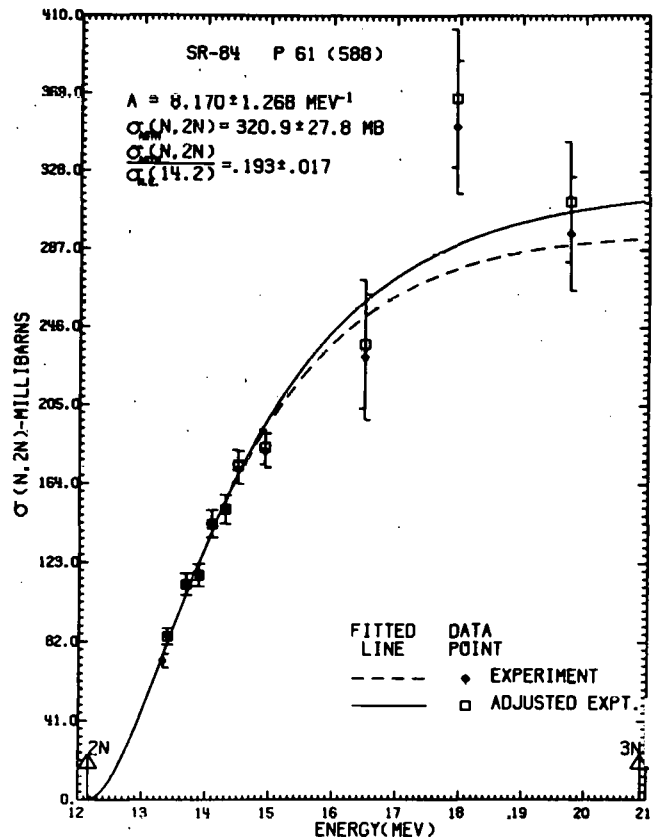
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1658.94 MB
 (N,2N) THRESHOLD = 12.16 MEV
 (N,3N) THRESHOLD = 20.90 MEV

THIS ISOTOPE HAS 46 NEUTRONS, 38 PROTONS, (MASS = 84)

NEUTRON EXCESS PARAMETER = .09524

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .1935 PLUS-MINUS .0168

N/SPACING = 5.630 A/SPACING = 10.282
 ERROR .874 ERROR 1.596

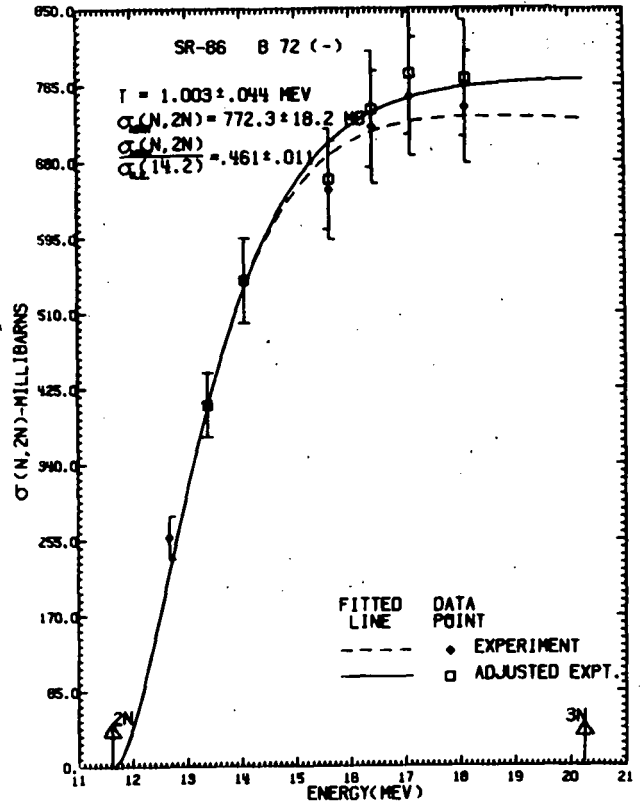


SR-86 ... FROM REF. B 72 (-)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.380	407.00	36.00	407.000	36.000	
14.060	547.00	48.00	547.000	48.000	
15.020	648.00	55.00	660.071	56.025	
16.410	718.00	63.00	737.747	64.733	
17.110	752.00	66.00	778.006	68.282	
18.120	740.00	62.00	772.285	64.705	

FITTED PARAMETERS
 NUCLEON TEMP. = 1.003 PLUS-OR-MINUS .044 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 772.26 PLUS-OR-MINUS 18.18 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1676.65 MB
 (N,2N) THRESHOLD = 11.62 MEV
 (N,3N) THRESHOLD = 20.24 MEV
 THIS ISOTOPE HAS 40 NEUTRONS, 38 PROTONS, (MASS = 86)
 NEUTRON EXCESS PARAMETER = .11026
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4606 PLUS-OR-MINUS .0106
 T/SUMT(N) = 0.949 T/SUMT(A) = 9.301
 ERROR .305 ERROR .408

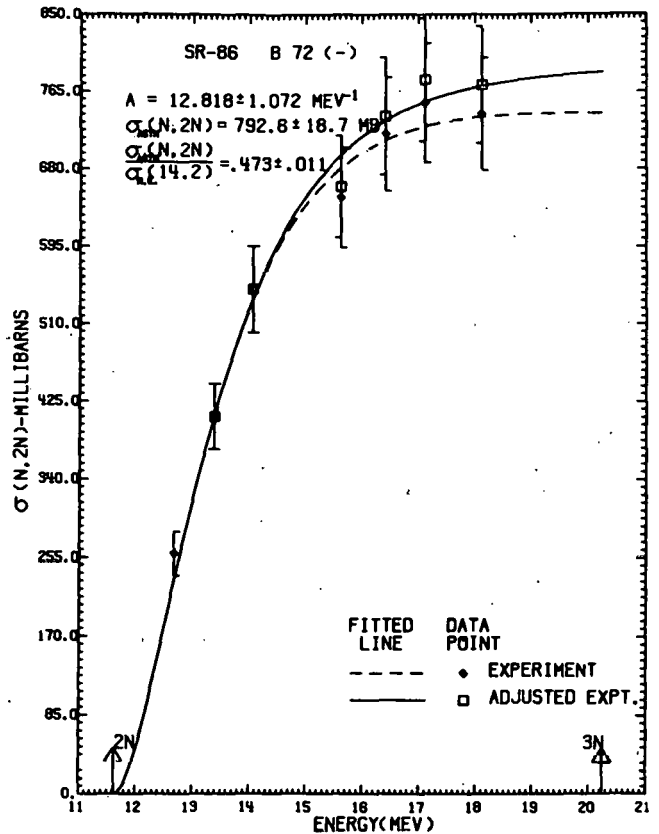


SR-86 ... FROM REF. B 72 (-)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.380	407.00	36.00	407.000	36.000	
14.060	547.00	48.00	547.000	48.000	
15.020	648.00	55.00	660.071	56.025	
16.410	718.00	63.00	737.747	64.733	
17.110	752.00	66.00	778.006	68.282	
18.120	740.00	62.00	772.285	64.705	

FITTED PARAMETERS
 LEVEL SPACING = 12.818 PLUS-OR-MINUS 1.072 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 792.64 PLUS-OR-MINUS 18.71 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1676.65 MB
 (N,2N) THRESHOLD = 11.62 MEV
 (N,3N) THRESHOLD = 20.24 MEV
 THIS ISOTOPE HAS 40 NEUTRONS, 38 PROTONS, (MASS = 86)
 NEUTRON EXCESS PARAMETER = .11628
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4727 PLUS-OR-MINUS .0112
 N/SPACING = 3.745 A/SPACING = 6.709
 ERROR .313 ERROR .561

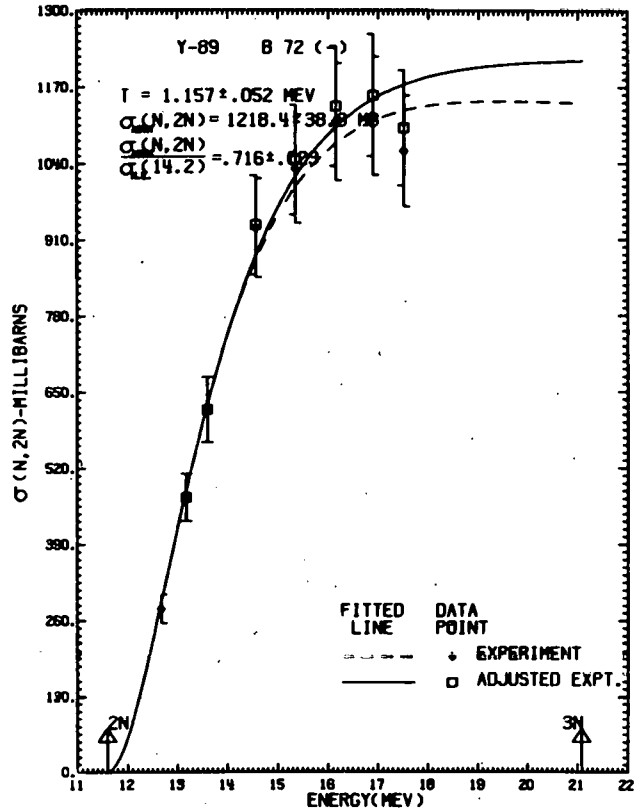


Y-89 ...FROM REF. B 72 (-)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB) ADJUSTED	ERR
13.180	470.00	41.00	470.000	41.000
13.600	620.00	56.00	620.000	56.000
14.560	930.00	84.00	934.578	84.413
15.350	1030.00	92.00	1045.330	93.369
16.150	1110.00	100.00	1136.521	102.389
16.890	1120.00	101.00	1155.117	104.167
17.510	1060.00	95.00	1099.239	98.517

FITTED PARAMETERS
 NUCLEON TEMP. = 1.157 PLUS-OR-MINUS .052 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1218.39 PLUS-OR-MINUS 38.85 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1702.82 MB
 (N,2N) THRESHOLD = 11.00 MEV
 (N,3N) THRESHOLD = 21.08 MEV
 THIS ISOTOPE HAS 50 NEUTRONS, 39 PROTONS, (MASS = 89)
 NEUTRON EXCESS PARAMETER = .12360
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7155 PLUS-OR-MINUS .0225
 T*SQRT(N) = 8.181 T*SQRT(A) = 10.915
 ERROR .368 ERROR .491

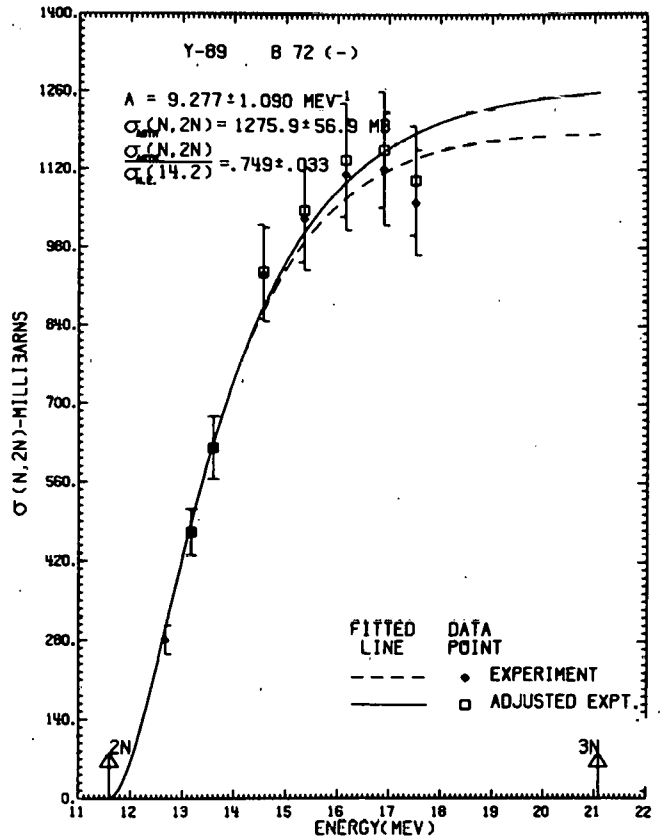


Y-89 ...FROM REF. B 72 (-)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB) ADJUSTED	ERR
13.180	470.00	41.00	470.000	41.000
13.600	620.00	56.00	620.000	56.000
14.560	930.00	84.00	934.578	84.413
15.350	1030.00	92.00	1045.330	93.369
16.150	1110.00	100.00	1136.521	102.389
16.890	1120.00	101.00	1155.117	104.167
17.510	1060.00	95.00	1099.239	98.517

FITTED PARAMETERS
 LEVEL SPACING = 9.277 PLUS-OR-MINUS 1.090 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1275.93 PLUS-OR-MINUS 56.94 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1702.82 MB
 (N,2N) THRESHOLD = 11.00 MEV
 (N,3N) THRESHOLD = 21.08 MEV
 THIS ISOTOPE HAS 50 NEUTRONS, 39 PROTONS, (MASS = 89)
 NEUTRON EXCESS PARAMETER = .12360
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7493 PLUS-OR-MINUS .0334
 N/SPACING = 5.390 A/SPACING = 9.594
 ERROR .633 ERROR 1.127



Y-89 ... FROM REF. A 69 (3053)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.290	621.90 7.10	621.900 7.100	
13.870	811.60 43.10	811.600 43.100	
15.270	1040.00 190.00	1054.482 192.046	
15.710	947.90 46.00	965.972 46.877	
16.080	954.30 40.90	976.388 41.847	
16.740	997.40 35.10	1027.228 36.150	
17.580	1126.00 72.00	1170.442 74.709	

FITTED PARAMETERS

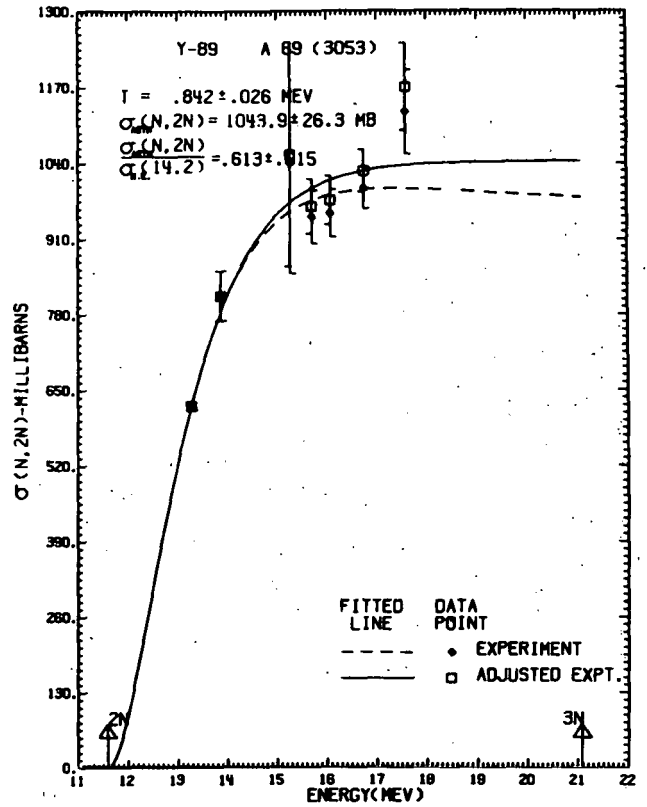
NUCLEAR TEMP. = .842 PLUS-OR-MINUS .026 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1043.66 PLUS-OR-MINUS 26.26 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1702.82 MB
 (N,2N) THRESHOLD = 11.60 MEV
 (N,3N) THRESHOLD = 21.08 MEV

THIS ISOTOPE HAS 50 NEUTRONS, 39 PROTONS, (MASS = 89)
 NEUTRON EXCESS PARAMETER = .12360
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .6130 PLUS-OR-MINUS .0154

T*SQRT(N) = 5.954 T*SQRT(A) = 7.943
 ERROR .184 ERROR .249



Y-89 ... FROM REF. A 69 (3053)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.290	621.90 7.10	621.900 7.100	
13.870	811.60 43.10	811.600 43.100	
15.270	1040.00 190.00	1054.482 192.046	
15.710	947.90 46.00	965.972 46.877	
16.080	954.30 40.90	976.388 41.847	
16.740	997.40 35.10	1027.228 36.150	
17.580	1126.00 72.00	1170.442 74.709	

FITTED PARAMETERS

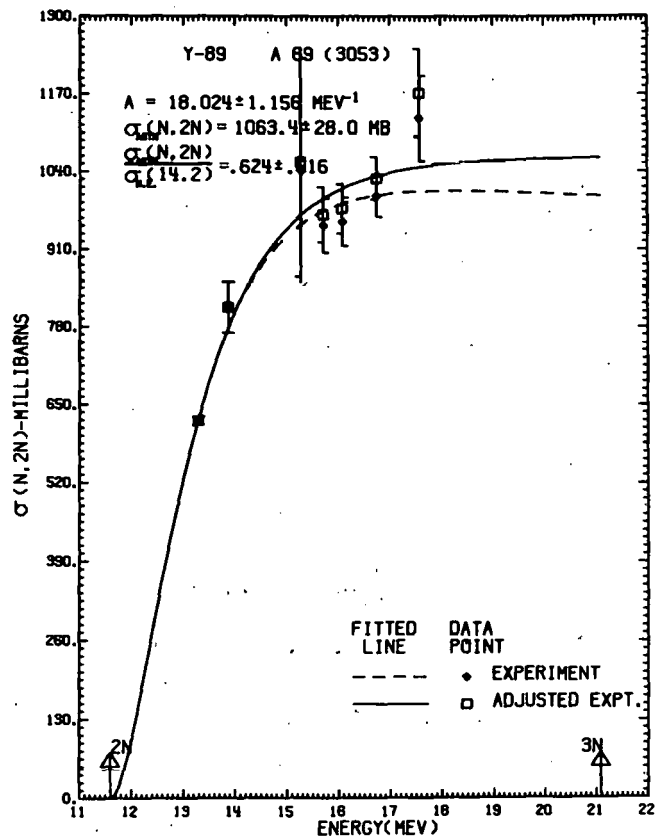
LEVEL SPACING = 18.024 PLUS-OR-MINUS 1.156 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1063.35 PLUS-OR-MINUS 28.00 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1702.82 MB
 (N,2N) THRESHOLD = 11.60 MEV
 (N,3N) THRESHOLD = 21.08 MEV

THIS ISOTOPE HAS 50 NEUTRONS, 39 PROTONS, (MASS = 89)
 NEUTRON EXCESS PARAMETER = .12360
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .6245 PLUS-OR-MINUS .0164

N/SPACING = 2.774 A/SPACING = 4.938
 ERROR .178 ERROR .317



Y-89 ... FROM REF. P 61 (588)

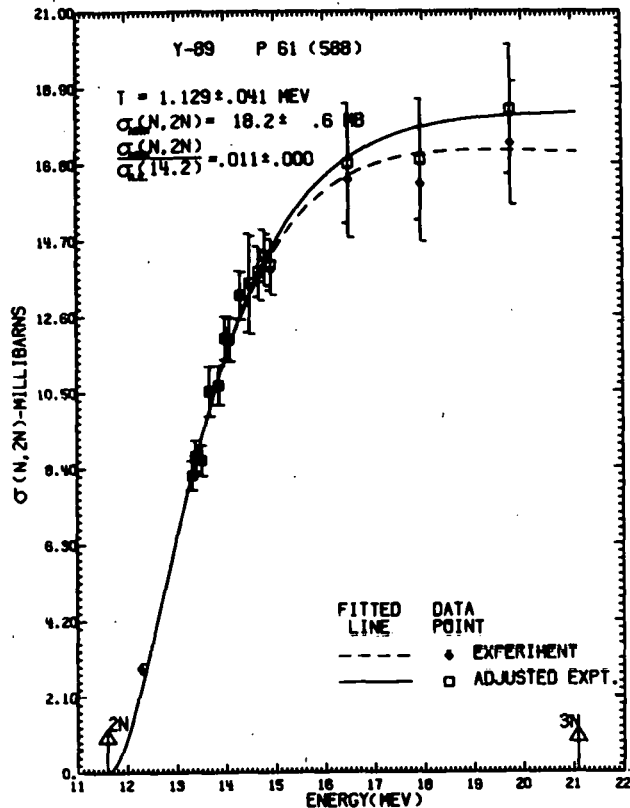
ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR	ADJUSTED	ERR
13.330	8.20	.41	8.200	.410
13.400	8.74	.44	8.740	.440
13.520	8.63	.43	8.630	.430
13.690	10.54	.69	10.540	.690
13.880	10.70	.54	10.700	.540
14.010	12.01	.60	12.010	.600
14.090	11.96	.60	11.960	.600
14.310	13.17	.60	13.190	.661
14.500	13.46	1.35	13.515	1.356
14.680	13.74	.69	13.829	.694
14.810	14.16	.71	14.276	.716
14.930	13.89	.70	14.025	.707
16.500	16.35	1.60	16.800	1.644
17.950	16.23	1.60	16.891	1.665
19.760	17.36	1.70	18.292	1.791

FITTED PARAMETERS

NUCLEAR TEMP. = 1.129 PLUS-OR-MINUS .041 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 18.23 PLUS-OR-MINUS .55 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1702.82 MB
 (N,2N) THRESHOLD = 11.60 MEV
 (N,3N) THRESHOLD = 21.08 MEV
 THIS ISOTOPE HAS 50 NEUTRONS, 39 PROTONS, (MASS = 89)
 NEUTRON EXCESS PARAMETER = .12360
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0107 PLUS-OR-MINUS .0003
 T=5URT(N) = 7.983 T=5URT(A) = 10.651
 ERROR .290 ERROR .387



Y-89 ... FROM REF. P 61 (588)

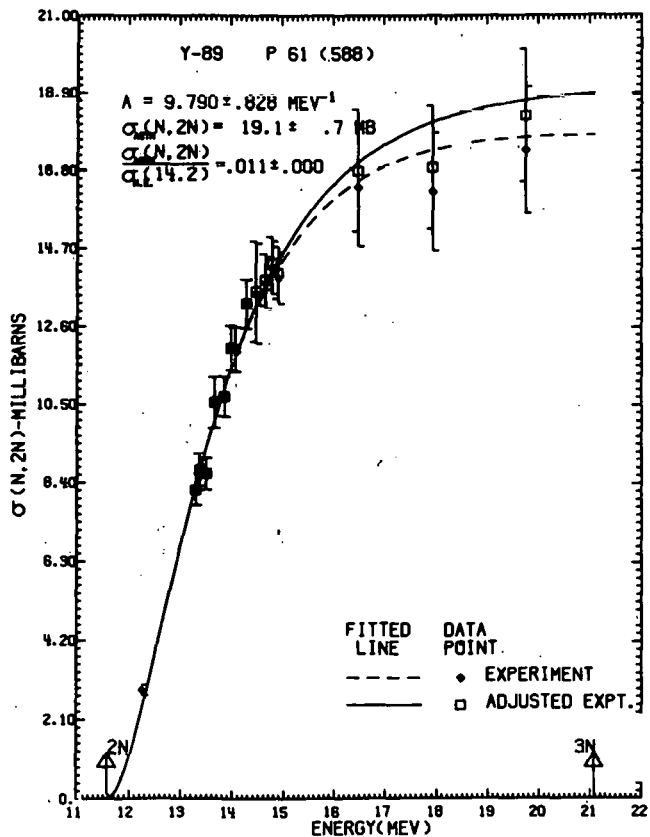
ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR	ADJUSTED	ERR
13.330	8.20	.41	8.200	.410
13.400	8.74	.44	8.740	.440
13.520	8.63	.43	8.630	.430
13.690	10.54	.69	10.540	.690
13.880	10.70	.54	10.700	.540
14.010	12.01	.60	12.010	.600
14.090	11.96	.60	11.960	.600
14.310	13.17	.66	13.190	.661
14.500	13.46	1.35	13.515	1.356
14.680	13.74	.69	13.829	.694
14.810	14.16	.71	14.276	.716
14.930	13.89	.70	14.025	.707
16.500	16.35	1.60	16.800	1.644
17.950	16.23	1.60	16.891	1.665
19.760	17.36	1.70	18.292	1.791

FITTED PARAMETERS

LEVEL SPACING = 9.790 PLUS-OR-MINUS .828 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 19.12 PLUS-OR-MINUS .72 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1702.82 MB
 (N,2N) THRESHOLD = 11.60 MEV
 (N,3N) THRESHOLD = 21.08 MEV
 THIS ISOTOPE HAS 50 NEUTRONS, 39 PROTONS, (MASS = 89)
 NEUTRON EXCESS PARAMETER = .12360
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .0112 PLUS-OR-MINUS .0004
 N/SPACING = 5.107 A/SPACING = 9.091
 ERROR .432 ERROR .769



Y-89 ... FROM REF. T 60 (590)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.800	239.00	48.00	239.000	48.000	
13.000	328.00	66.00	328.000	66.000	
13.850	584.00	120.00	584.000	120.000	
14.000	678.00	140.00	678.000	140.000	
14.500	685.00	140.00	687.822	140.577	
15.100	1003.00	200.00	1014.887	202.370	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.639 PLUS-OR-MINUS .252 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1475.55 PLUS-OR-MINUS 278.68 MB

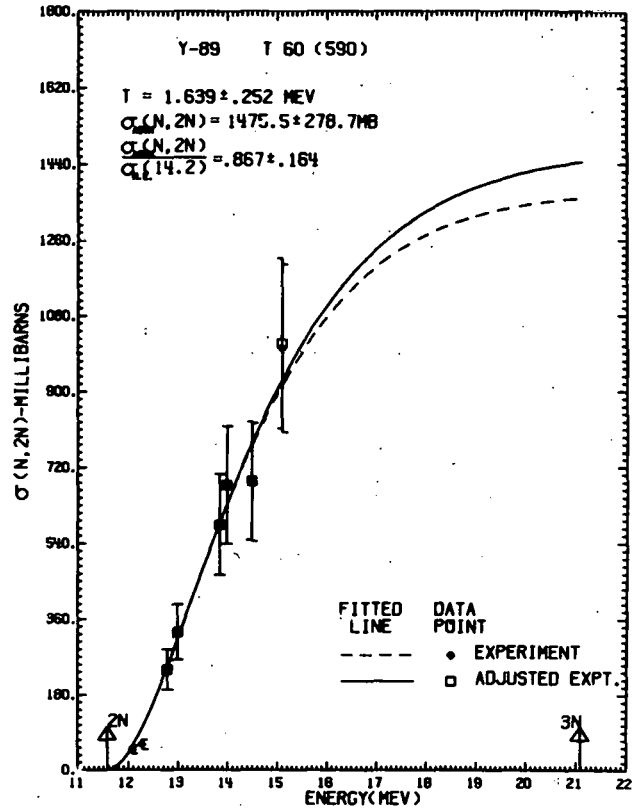
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1702.82 MB
 (N,2N) THRESHOLD = 11.60 MEV
 (N,3N) THRESHOLD = 21.08 MEV

THIS ISOTOPE HAS 50 NEUTRONS, 39 PROTONS, (MASS = 89)
 NEUTRON EXCESS PARAMETER = .12360

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8665 PLUS-OR-MINUS .1637

T=SCRT(N) = 11.589 T=SCRT(A) = 15.462
 ERROR 1.782 ERROR 2.377



Y-89 ... FROM REF. T 60 (590)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.800	239.00	48.00	239.000	48.000	
13.000	328.00	66.00	328.000	66.000	
13.850	584.00	120.00	584.000	120.000	
14.000	678.00	140.00	678.000	140.000	
14.500	685.00	140.00	687.822	140.577	
15.100	1003.00	200.00	1014.887	202.370	

FITTED PARAMETERS

LEVEL SPACING = 3.674 PLUS-OR-MINUS 1.350 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1815.74 PLUS-OR-MINUS 444.32 MB

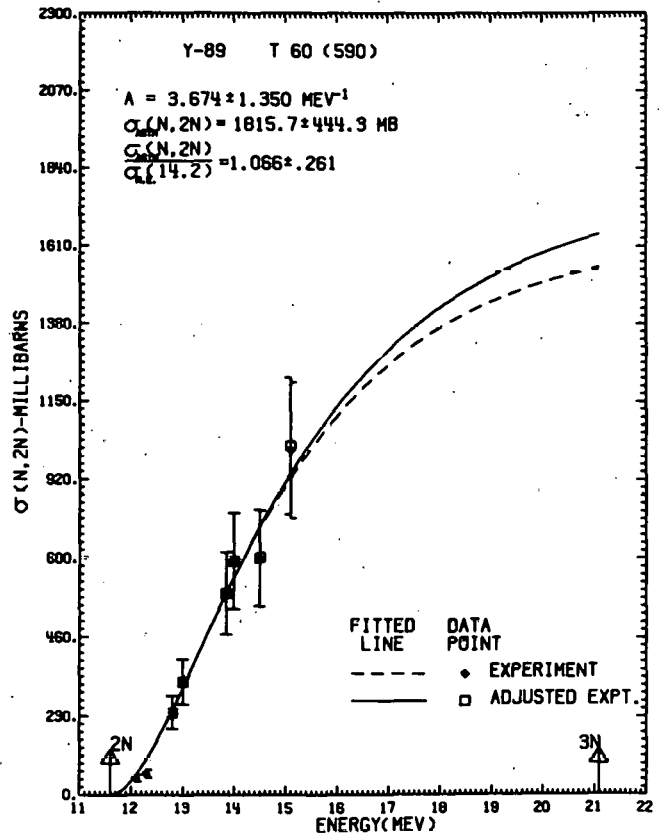
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1702.82 MB
 (N,2N) THRESHOLD = 11.60 MEV
 (N,3N) THRESHOLD = 21.08 MEV

THIS ISOTOPE HAS 50 NEUTRONS, 39 PROTONS, (MASS = 89)
 NEUTRON EXCESS PARAMETER = .12360

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.0663 PLUS-OR-MINUS .2609

N/SPACING = 13.609 A/SPACING = 24.224
 ERROR 5.001 ERROR 8.901

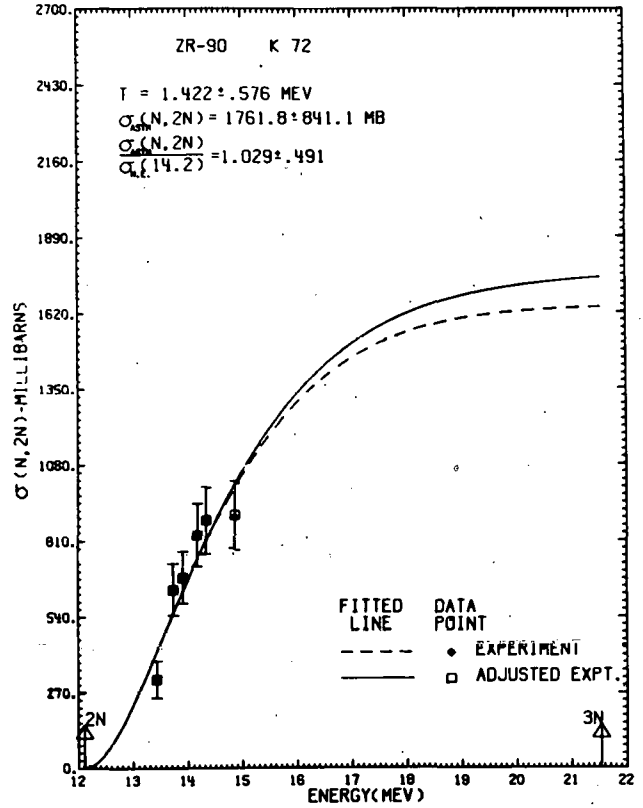


ZR-90 ... FROM REF. K 72

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.440	317.00	66.00	317.000	66.000	
13.740	438.00	93.00	638.000	93.000	
13.920	491.00	93.00	681.000	93.000	
14.180	632.00	112.00	832.000	112.000	
14.340	893.00	118.00	884.699	118.227	
14.870	896.00	118.09	903.950	119.047	

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.422 PLUS-OR-MINUS .576 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1761.84 PLUS-OR-MINUS 841.06 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1711.44 MB
 (N,2N) THRESHOLD = 12.12 MEV
 (N,3N) THRESHOLD = 21.53 MEV
 THIS ISOTOPE HAS 90 NEUTRONS, 40 PROTONS, (MASS = 90)
 NEUTRON EXCESS PARAMETER = .11111
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.0294 PLUS-OR-MINUS .4914
 T=SOFT(N) = 10.055 T=SOFT(A) = 13.490
 ERROR 4.073 ERROR 5.464

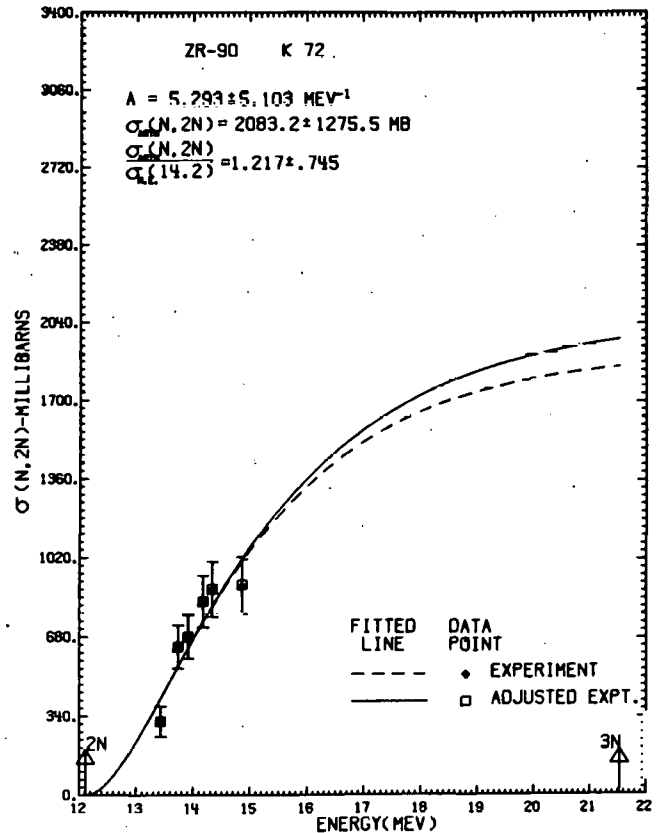


ZR-90 ... FROM REF. K 72

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.440	317.00	66.00	317.000	66.000	
13.740	638.00	93.00	638.000	93.000	
13.920	681.00	93.00	681.000	93.000	
14.180	832.00	112.00	832.000	112.000	
14.340	893.00	118.00	884.699	118.227	
14.870	896.00	118.00	903.950	119.047	

FITTED PARAMETERS
 LEVEL SPACING = 5.293 PLUS-OR-MINUS 1.03PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2083.19 PLUS-OR-MINUS 1275.50 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1711.44 MB
 (N,2N) THRESHOLD = 12.12 MEV
 (N,3N) THRESHOLD = 21.53 MEV
 THIS ISOTOPE HAS 90 NEUTRONS, 40 PROTONS, (MASS = 90)
 NEUTRON EXCESS PARAMETER = .11111
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.2172 PLUS-OR-MINUS .7453
 N/SPACING = 9.446 A/SPACING = 17.004
 ERROR 9.107 ERROR 16.393



ZR-90 ... FROM REF. A 69 (2366)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.570	596.50	4.40	596.500	4.400
14.200	677.90	28.50	677.900	28.500
14.520	759.20	5.80	762.497	5.825
14.860	815.70	15.50	822.834	15.636
15.140	885.50	4.00	896.317	4.049
15.330	1001.20	6.50	1015.709	6.594
15.490	993.70	4.40	1009.958	4.472
15.920	1053.60	11.10	1075.913	11.335
16.260	1024.60	15.40	1050.202	15.785
16.580	1225.60	9.10	1259.934	9.355
17.070	1108.20	6.90	1144.417	7.125
17.550	1241.90	9.00	1287.774	9.332
18.180	1385.80	7.60	1444.121	7.920

FITTED PARAMETERS

NUCLEAR TEMP. = 1.161 PLUS-OR-MINUS .115 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1313.6 PLUS-OR-MINUS 78.41 MB

RELATED DATA

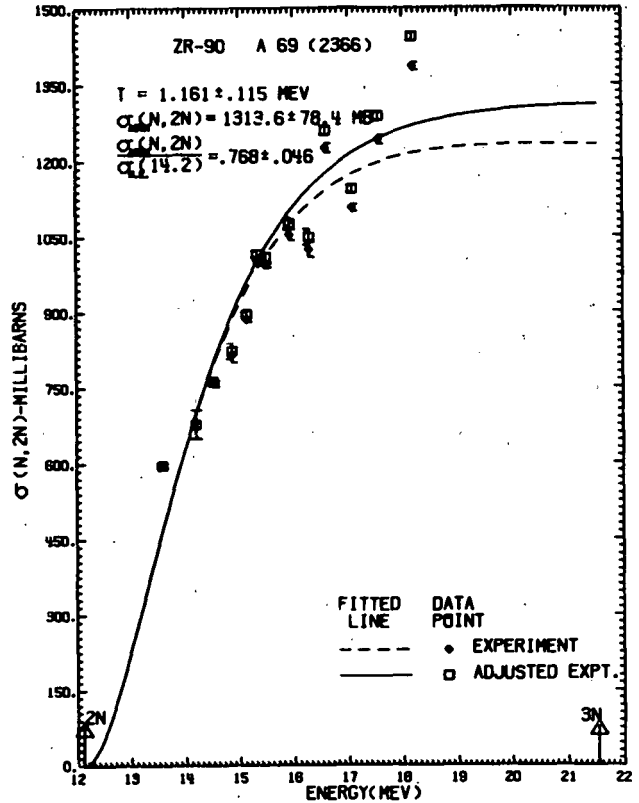
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1711.44 MB
 (N,2N) THRESHOLD = 12.12 MEV
 (N,3N) THRESHOLD = 21.53 MEV

THIS ISOTOPE HAS 50 NEUTRONS, 40 PROTONS, (MASS = 90)

NEUTRON EXCESS PARAMETER = .11111

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7675 PLUS-OR-MINUS .0458

T=SQRT(N) = 8.210 T=SQRT(A) = 11.014
 ERROR .613 ERROR 1.091



ZR-90 ... FROM REF. A 69 (2366)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.570	596.50	4.40	596.500	4.400
14.200	677.90	28.50	677.900	28.500
14.520	759.20	5.80	762.497	5.825
14.860	815.70	15.50	822.834	15.636
15.140	885.50	4.00	896.317	4.049
15.330	1001.20	6.50	1015.709	6.594
15.490	993.70	4.40	1009.958	4.472
15.920	1053.60	11.10	1075.913	11.335
16.260	1024.60	15.40	1050.202	15.785
16.580	1225.60	9.10	1259.934	9.355
17.070	1108.20	6.90	1144.417	7.125
17.550	1241.90	9.00	1287.774	9.332
18.180	1385.80	7.60	1444.121	7.920

FITTED PARAMETERS

LEVEL SPACING = 9.814 PLUS-OR-MINUS 1.932 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1372.55 PLUS-OR-MINUS 89.21 MB

RELATED DATA

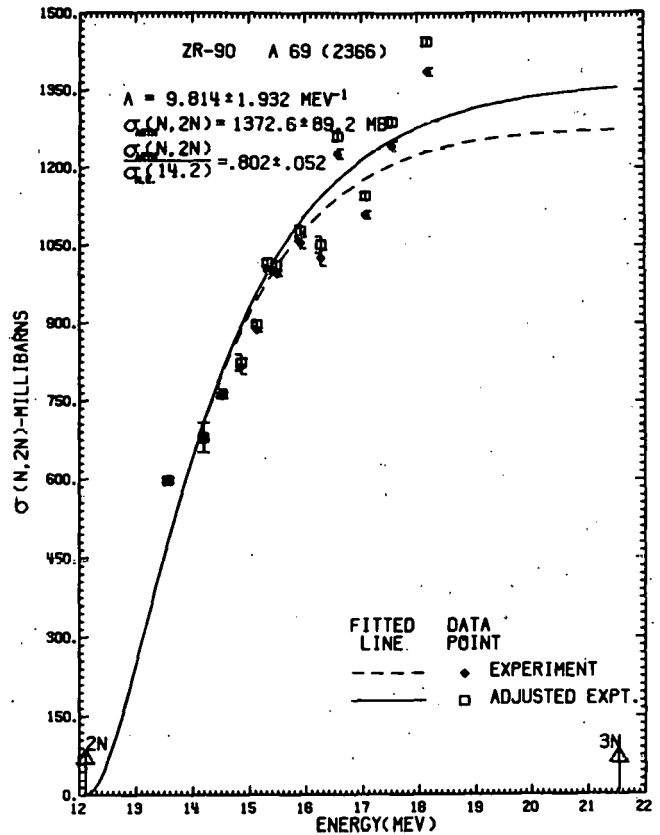
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1711.44 MB
 (N,2N) THRESHOLD = 12.12 MEV
 (N,3N) THRESHOLD = 21.53 MEV

THIS ISOTOPE HAS 50 NEUTRONS, 40 PROTONS, (MASS = 90)

NEUTRON EXCESS PARAMETER = .11111

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8020 PLUS-OR-MINUS .0521

N/SPACING = 5.095 A/SPACING = 9.171
 ERROR 1.003 ERROR 1.805

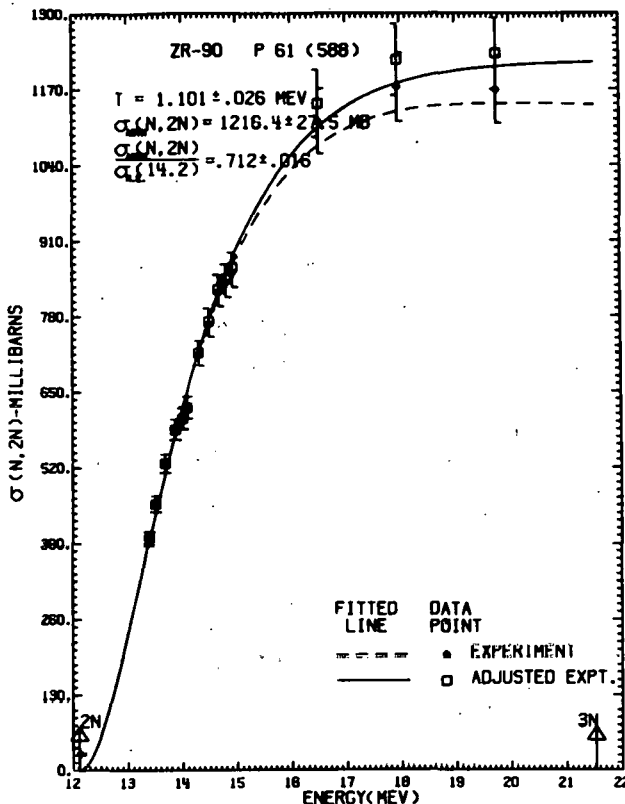


ZR-90 ... FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED, ENM	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.400	398.00	12.00	398.000 12.000
13.520	457.00	14.00	457.000 14.000
13.690	527.00	16.00	527.000 16.000
13.880	585.00	18.00	585.000 18.000
14.010	604.00	18.00	604.000 18.000
14.090	623.00	19.00	623.000 19.000
14.310	716.00	21.00	717.085 21.032
14.500	768.00	23.00	771.132 23.094
14.680	822.00	25.00	827.295 25.161
14.810	838.00	25.00	844.798 25.203
14.930	856.00	26.00	864.241 26.250
16.500	1115.00	56.00	1145.350 57.524
17.950	1173.00	59.00	1220.227 61.375
19.760	1169.00	58.00	1230.973 61.075

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.101 PLUS-OR-MINUS .026 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1216.36 PLUS-OR-MINUS 27.51 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1711.44 MB
 (N,2N) THRESHOLD = 12.12 MEV
 (N,3N) THRESHOLD = 21.53 MEV
 THIS ISOTOPE HAS 50 NEUTRONS, 40 PROTONS, (MASS = 90)
 NEUTRON EXCESS PARAMETER = .11111
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7119 PLUS-OR-MINUS .0161
 T*SQRT(N) = 7.785 T*SQRT(A) = 10.445
 ERROR .184 ERROR .247

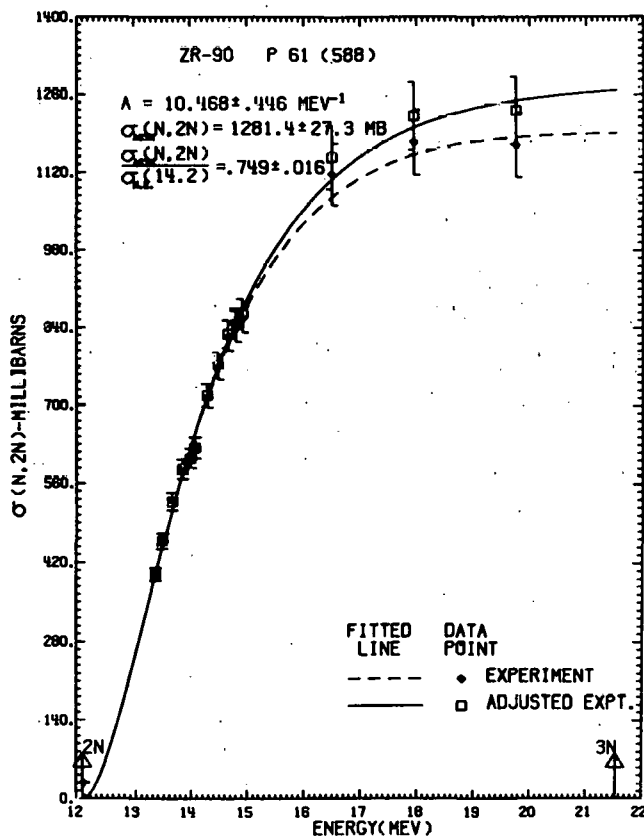


ZR-90 ... FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED, ENM	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.010	604.00	18.00	604.000 18.000
13.400	398.00	12.00	398.000 12.000
13.520	457.00	14.00	457.000 14.000
13.690	527.00	16.00	527.000 16.000
13.880	585.00	18.00	585.000 18.000
14.090	623.00	19.00	623.000 19.000
14.310	716.00	21.00	717.085 21.032
14.500	768.00	23.00	771.132 23.094
14.680	822.00	25.00	827.295 25.161
14.810	838.00	25.00	844.798 25.203
14.930	856.00	26.00	864.241 26.250
16.500	1115.00	56.00	1145.350 57.524
17.950	1173.00	59.00	1220.227 61.375
19.760	1169.00	58.00	1230.973 61.075

FITTED PARAMETERS
 LEVEL SPACING = 10.468 PLUS-OR-MINUS .446 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1281.40 PLUS-OR-MINUS 27.25 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1711.44 MB
 (N,2N) THRESHOLD = 12.12 MEV
 (N,3N) THRESHOLD = 21.53 MEV
 THIS ISOTOPE HAS 50 NEUTRONS, 40 PROTONS, (MASS = 90)
 NEUTRON EXCESS PARAMETER = .11111
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7487 PLUS-OR-MINUS .0159
 N/SPACING = 4.776 A/SPACING = 8.598
 ERROR .204 ERROR .366

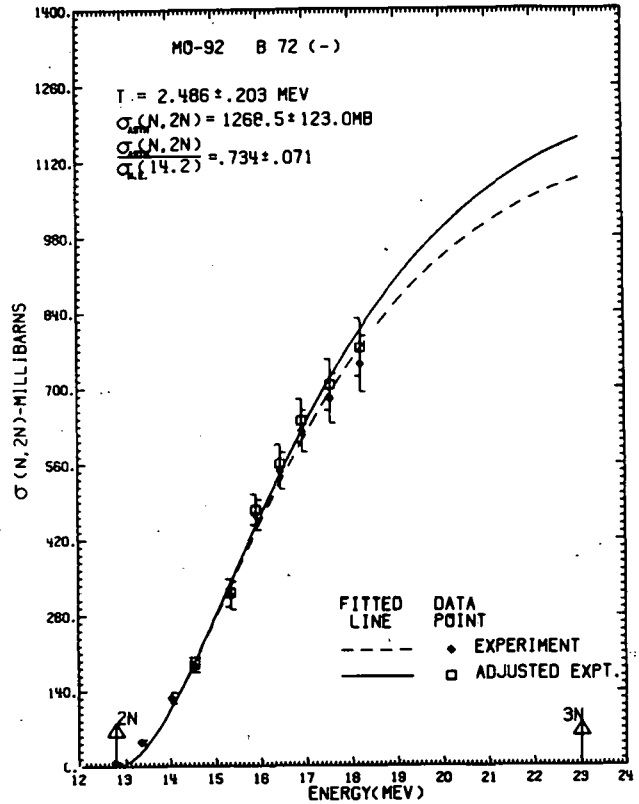


MO-92 ...FROM REF. B 72 (-)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.950	186.00 13.00	188.873	13.060
15.360	317.00 26.00	321.608	26.378
15.920	466.00 28.00	475.659	28.580
16.450	547.00 34.00	561.297	34.889
16.940	671.00 39.00	640.113	40.200
17.560	682.00 46.00	706.677	47.664
18.230	745.00 52.00	775.904	54.157

FITTED PARAMETERS
 NUCLEAR TEMP. = 2.486 PLUS-OR-MINUS .203 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1268.53 PLUS-OR-MINUS 123.01 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1728.53 MB
 (N,2N) THRESHOLD = 12.83 MEV
 (N,3N) THRESHOLD = 23.02 MEV
 THIS ISOTOPE HAS 50 NEUTRONS, 42 PROTONS, (MASS = 92)
 NEUTRON EXCESS PARAMETER = .08696
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7339 PLUS-OR-MINUS .0712
 T=SQRT(N) = 17.579 T=SQRT(A) = 23.845
 ERROR 1.435 ERROR 1.947

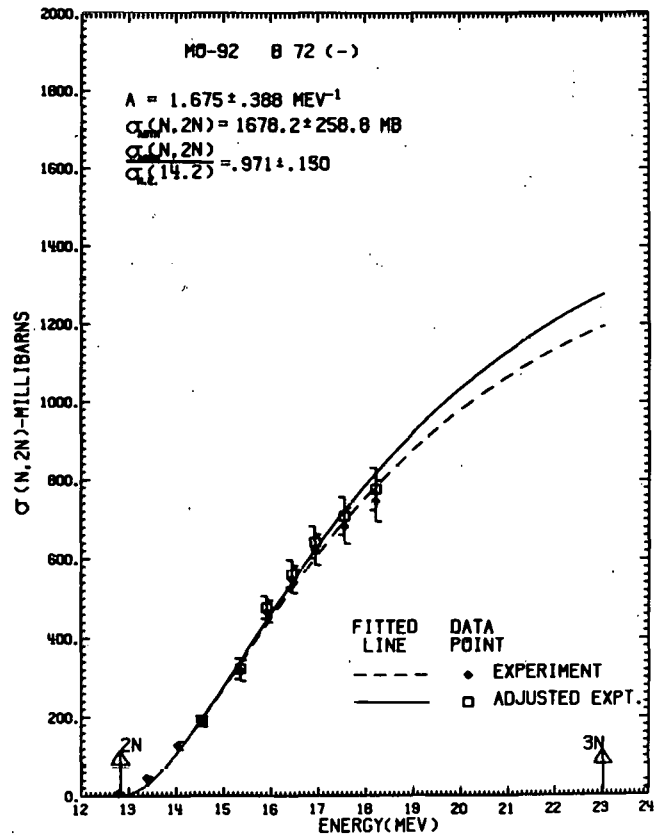


MO-92 ...FROM REF. B 72 (-)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.950	188.00 13.00	188.873	13.060
15.360	317.00 26.00	321.608	26.378
15.920	466.00 28.00	475.659	28.580
16.450	547.00 34.00	561.297	34.889
16.940	621.00 39.00	640.113	40.200
17.560	682.00 46.00	706.677	47.664
18.230	745.00 52.00	775.904	54.157

FITTED PARAMETERS
 LEVEL SPACING = 1.675 PLUS-OR-MINUS .388 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1678.19 PLUS-OR-MINUS 258.82 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1728.53 MB
 (N,2N) THRESHOLD = 12.83 MEV
 (N,3N) THRESHOLD = 23.02 MEV
 THIS ISOTOPE HAS 50 NEUTRONS, 42 PROTONS, (MASS = 92)
 NEUTRON EXCESS PARAMETER = .08696
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .9709 PLUS-OR-MINUS .1497
 N/SPACING = 29.851 A/SPACING = 54.925
 ERROR 6.915 ERROR 12.723

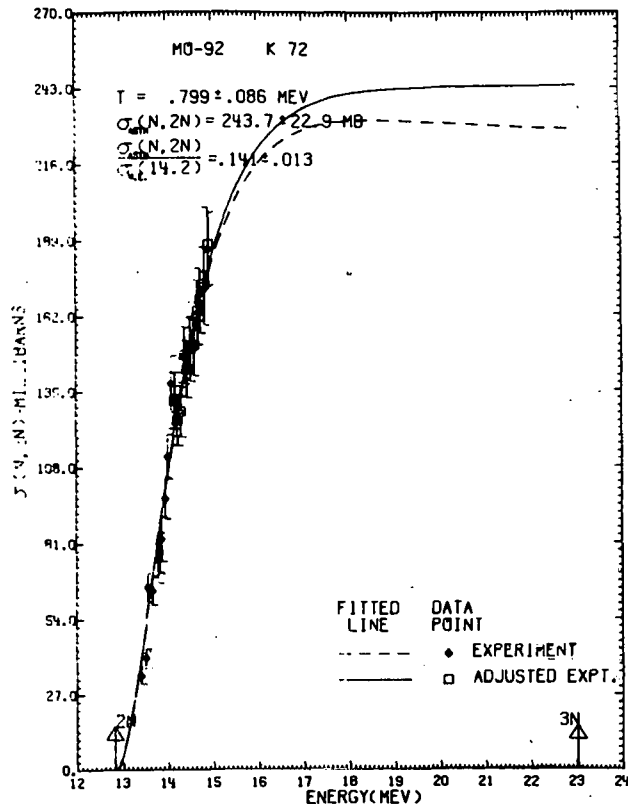


MO-92 ...FROM REF, K 72

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.170	132.00 10.00	132.000	10.000
14.230	125.00 9.00	125.051	9.004
14.310	129.00 9.00	128.190	9.013
14.390	148.00 10.00	148.378	10.026
14.440	143.00 10.00	143.459	10.032
14.520	150.00 11.00	150.638	11.047
14.600	151.00 10.00	151.799	10.053
14.650	163.00 11.00	164.029	11.069
14.740	167.00 11.00	168.181	11.078
14.840	172.00 13.00	173.431	13.108
14.920	186.00 13.00	187.731	13.121

FITTED PARAMETERS
 NUCLEAR TEMPERATURE = .799 PLUS-OR-MINUS .006 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 243.74 PLUS-OR-MINUS 22.86 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1728.53 MB
 (N,2N) THRESHOLD = 12.83 MEV
 (N,3N) THRESHOLD = 23.02 MEV
 THIS ISOTOPE HAS 50 NEUTRONS, 42 PROTONS, (MASS = 92)
 NEUTRON EXCESS PARAMETER = .08696
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .1410 PLUS-OR-MINUS .0132
 T-SQRT(N) = 9.450 T-SQRT(A) = 7.064
 ERROR = .608 ERROR = .625

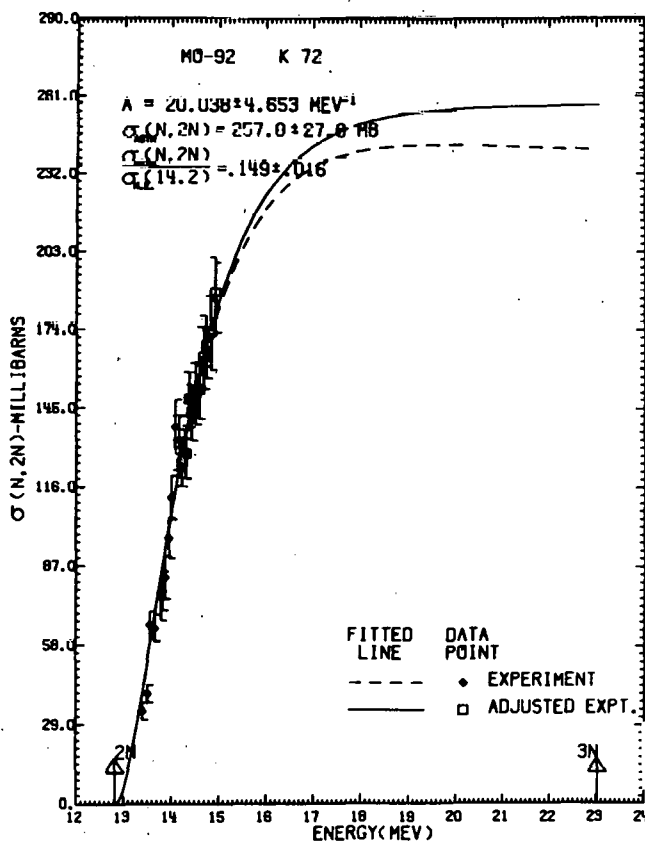


MO-92 ...FROM REF, K 72

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
14.170	132.00 10.00	132.000	10.000
14.230	125.00 9.00	125.051	9.004
14.310	129.00 9.00	128.190	9.013
14.390	148.00 10.00	148.378	10.026
14.440	143.00 10.00	143.459	10.032
14.520	150.00 11.00	150.638	11.047
14.600	151.00 10.00	151.799	10.053
14.650	163.00 11.00	164.029	11.069
14.740	167.00 11.00	168.181	11.078
14.840	172.00 13.00	173.431	13.108
14.920	186.00 13.00	187.731	13.121

FITTED PARAMETERS
 LEVEL SPACING 820.038 PLUS-OR-MINUS 4.653 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 257.77 PLUS-OR-MINUS 27.55 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1728.53 MB
 (N,2N) THRESHOLD = 12.83 MEV
 (N,3N) THRESHOLD = 23.02 MEV
 THIS ISOTOPE HAS 50 NEUTRONS, 42 PROTONS, (MASS = 92)
 NEUTRON EXCESS PARAMETER = .08696
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .1491 PLUS-OR-MINUS .0159
 N/SPACING = 2.495 A/SPACING = 4.591
 ERROR = .579 ERROR = 1.066

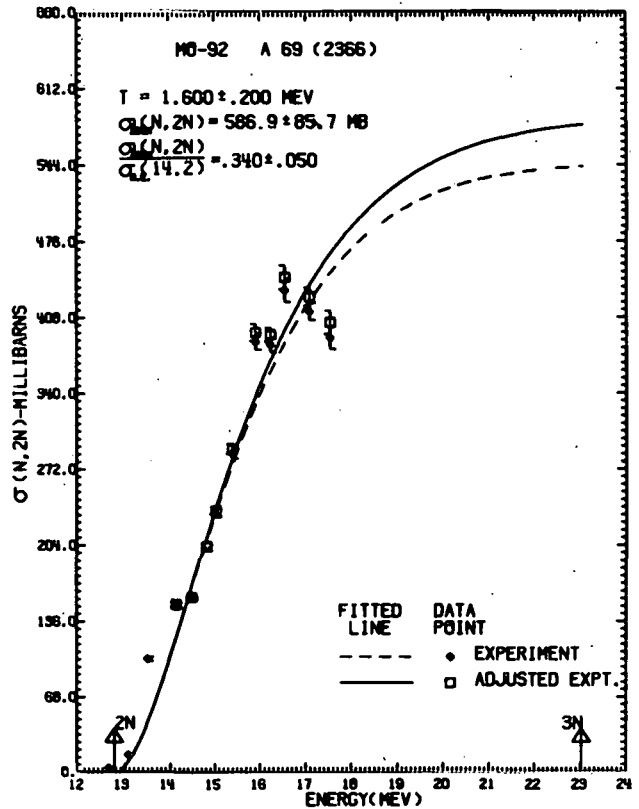


MO-92 ...FROM REF. A 69 (2366)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR	
14.180	150.70	2.30	150.700	2.300
14.530	156.30	1.50	156.986	1.507
14.850	201.50	2.60	203.202	2.622
15.050	232.20	3.30	234.728	3.336
15.410	285.90	4.30	290.220	4.365
15.920	386.60	7.70	394.613	7.860
16.250	383.30	6.10	392.555	6.247
16.560	432.10	10.40	443.857	10.683
17.090	413.10	7.00	426.373	8.051
17.540	389.40	10.10	403.425	10.464

FITTED PARAMETERS
 NUCLEON TEMP. = 1.600 PLUS-OR-MINUS .200 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 586.9 PLUS-OR-MINUS 85.72 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1728.53 MB
 (N,2N) THRESHOLD = 12.83 MEV
 (N,3N) THRESHOLD = 23.02 MEV
 THIS ISOTOPE HAS 50 NEUTRONS, 42 PROTONS, (MASS = 92)
 NEUTRON EXCESS PARAMETER = .08696
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .3396 PLUS-OR-MINUS .0496
 T=SQRT(N) = 11.314 T=SQRT(A) = 15.347
 ERROR 1.414 ERROR 1.918

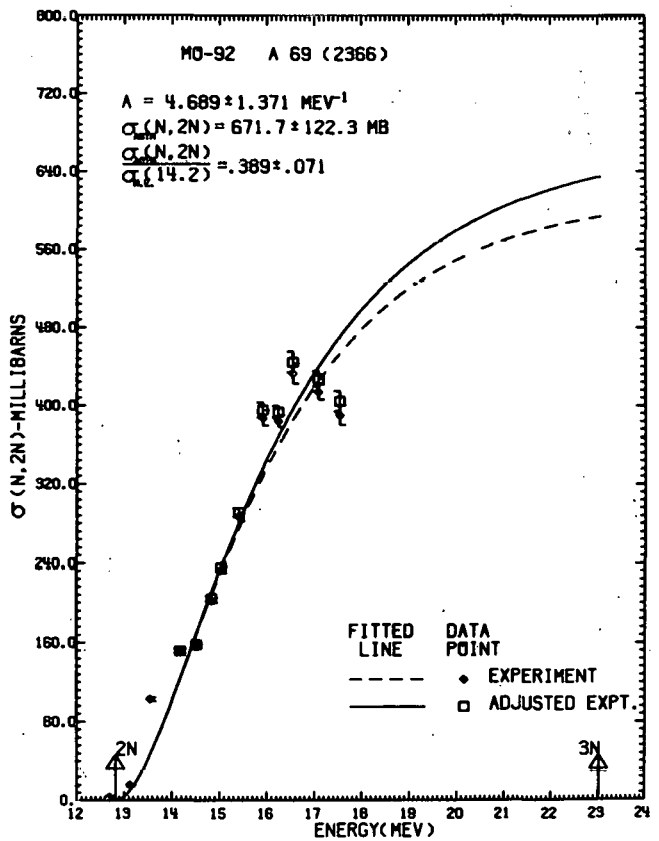


MO-92 ...FROM REF. A 69 (2366)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR	
14.180	150.70	2.30	150.700	2.300
14.530	156.30	1.50	156.986	1.507
14.850	201.50	2.60	203.202	2.622
15.050	232.20	3.30	234.728	3.336
15.410	285.90	4.30	290.220	4.365
15.920	386.60	7.70	394.613	7.860
16.250	383.30	6.10	392.555	6.247
16.560	432.10	10.40	443.857	10.683
17.090	413.10	7.00	426.373	8.051
17.540	389.40	10.10	403.425	10.464

FITTED PARAMETERS
 LEVEL SPACING = 4.689 PLUS-OR-MINUS 1.371 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 671.68 PLUS-OR-MINUS 122.30 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1728.53 MB
 (N,2N) THRESHOLD = 12.83 MEV
 (N,3N) THRESHOLD = 23.02 MEV
 THIS ISOTOPE HAS 50 NEUTRONS, 42 PROTONS, (MASS = 92)
 NEUTRON EXCESS PARAMETER = .08696
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .3886 PLUS-OR-MINUS .0708
 N/SPACING = 10.663 A/SPACING = 19.620
 ERROR 3.118 ERROR 5.737



MO-92 ... FROM REF. B 52 (83)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
14.600	300.00	100.00	301.587	100.529	
16.900	770.00	150.00	793.416	154.562	
19.300	950.00	180.00	996.441	188.799	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.734 PLUS-OR-MINUS .103 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1138.74 PLUS-OR-MINUS 52.04 MB

RELATED DATA

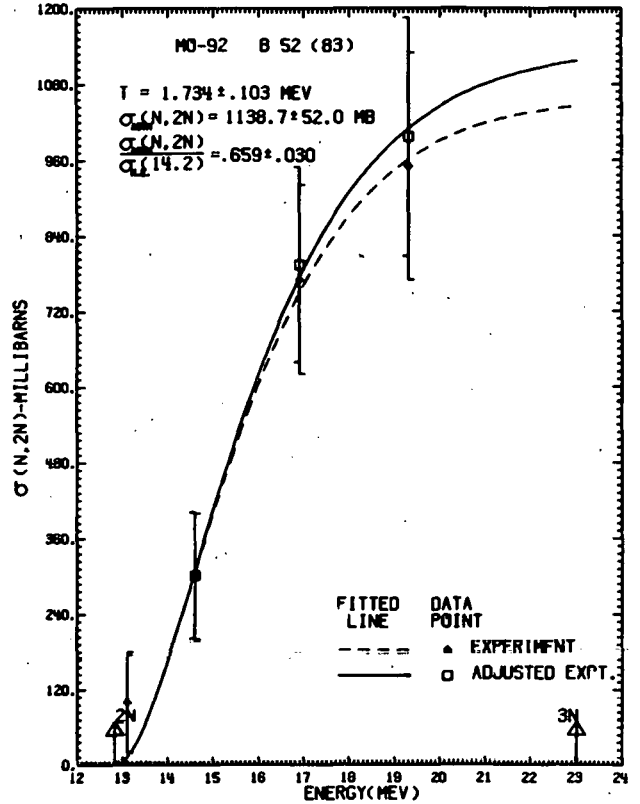
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1728.53 MB
 (N,2N) THRESHOLD = 12.83 MEV
 (N,3N) THRESHOLD = 23.02 MEV

THIS ISOTOPE HAS 50 NEUTRONS, 42 PROTONS, (MASS = 92)

NEUTRON EXCESS PARAMETER = .08696

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6588 PLUS-OR-MINUS .0301

T=SQRT(N) = 12.261 T=SQRT(A) = 16.632
 ERROR .728 ERROR .988



MO-92 ... FROM REF. B 52 (83)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
14.600	300.00	100.00	301.587	100.529	
16.900	770.00	150.00	793.416	154.562	
19.300	950.00	180.00	996.441	188.799	

FITTED PARAMETERS

LEVEL SPACING = 4.294 PLUS-OR-MINUS .889 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1257.15 PLUS-OR-MINUS 112.77 MB

RELATED DATA

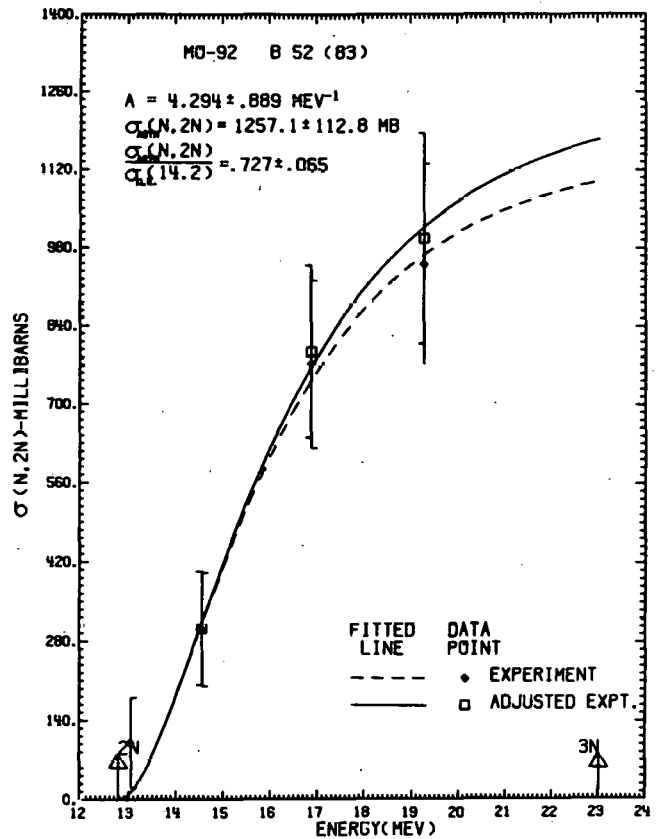
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1728.53 MB
 (N,2N) THRESHOLD = 12.83 MEV
 (N,3N) THRESHOLD = 23.02 MEV

THIS ISOTOPE HAS 50 NEUTRONS, 42 PROTONS, (MASS = 92)

NEUTRON EXCESS PARAMETER = .08696

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7273 PLUS-OR-MINUS .0652

N/SPACING = 11.644 A/SPACING = 21.425
 ERROR 2.411 ERROR 4.436



RU-96 ...FROM REF. B 70

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.600	450.00 50.00	450.000 50.000	
13.300	610.00 60.00	610.000 60.000	
13.900	770.00 70.00	770.000 70.000	
14.600	880.00 80.00	886.610 80.601	
15.300	890.00 70.00	901.819 70.930	
16.100	990.00 70.00	1011.442 71.516	
16.700	1000.00 90.00	1027.313 92.458	
17.400	990.00 70.00	1022.953 72.330	
18.100	910.00 60.00	945.166 62.319	

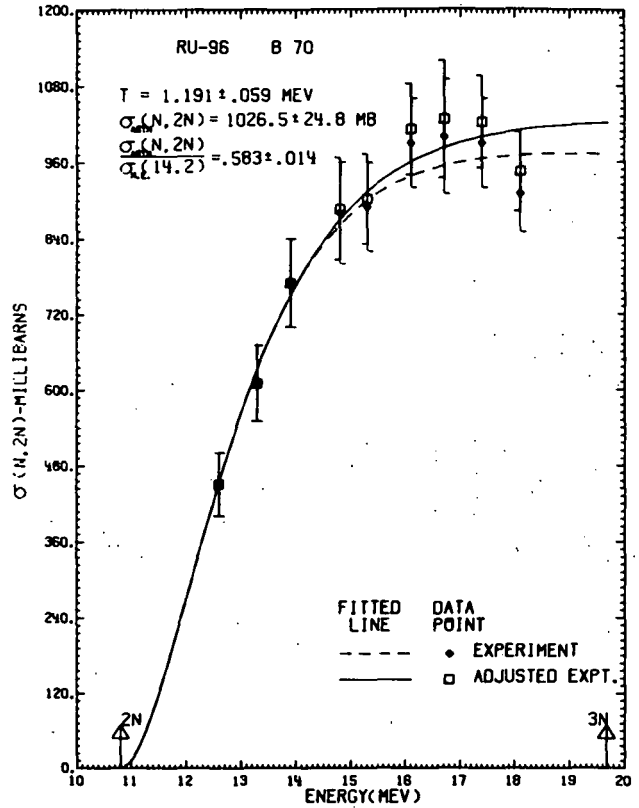
FITTED PARAMETERS
 NUCLEAR TEMP. = 1.191 PLUS-OR-MINUS .059 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1026.49 PLUS-OR-MINUS 24.78 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1762.16 MB
 (N,2N) THRESHOLD = 10.81 MEV
 (N,3N) THRESHOLD = 19.67 MEV

THIS ISOTOPE HAS 52 NEUTRONS, 44 PROTONS, (MASS = 96)
 NEUTRON EXCESS PARAMETER = .08333

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .625 PLUS-OR-MINUS .0141

T*SORT(N) = 8.598 T*SORT(A) = 11.669
 ERROR .425 ERROR .578



RU-96 ...FROM REF. B 70

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.600	450.00 50.00	450.000 50.000	
13.300	610.00 60.00	610.000 60.000	
13.900	770.00 70.00	770.000 70.000	
14.600	880.00 80.00	886.610 80.601	
15.300	890.00 70.00	901.819 70.930	
16.100	990.00 70.00	1011.442 71.516	
16.700	1000.00 90.00	1027.313 92.458	
17.400	990.00 70.00	1022.953 72.330	
18.100	910.00 60.00	945.166 62.319	

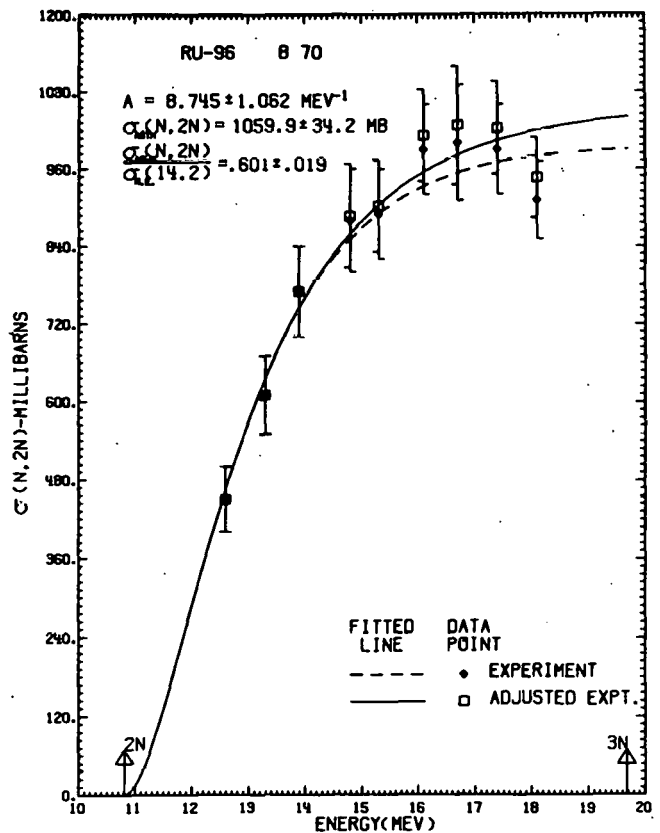
FITTED PARAMETERS
 LEVEL SPACING = 8.745 PLUS-OR-MINUS 1.062 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1059.87 PLUS-OR-MINUS 34.21 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1762.16 MB
 (N,2N) THRESHOLD = 10.81 MEV
 (N,3N) THRESHOLD = 19.67 MEV

THIS ISOTOPE HAS 52 NEUTRONS, 44 PROTONS, (MASS = 96)
 NEUTRON EXCESS PARAMETER = .08333

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6015 PLUS-OR-MINUS .0194

N/SPACING = 5.946 A/SPACING = 10.978
 ERROR .722 ERROR 1.333

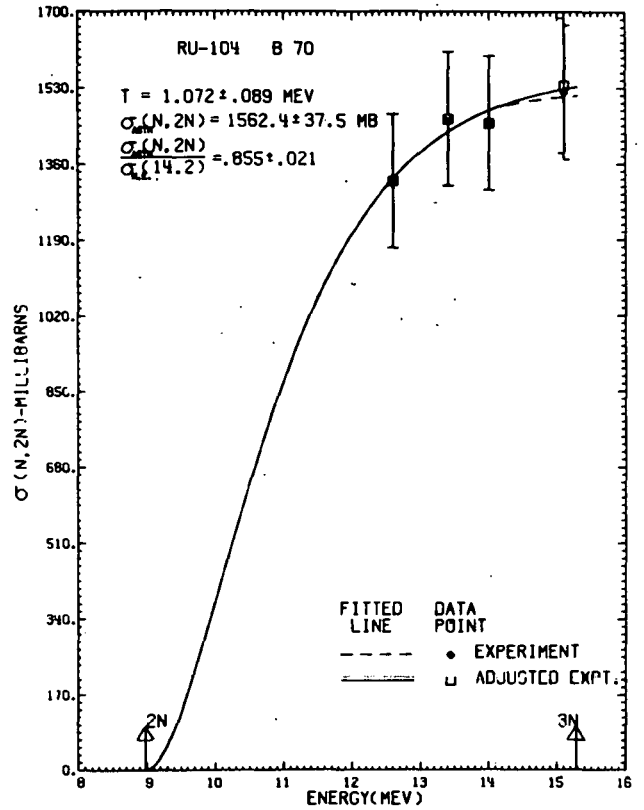


RU-104 ... FROM REF. B 70

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.600	1326.00 150.00	1320.000	150.000
13.400	1460.00 150.00	1460.000	150.000
14.000	1490.00 150.00	1490.000	150.000
15.100	1520.00 150.00	1535.440	151.524

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.072 PLUS-OR-MINUS .089 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1562.42 PLUS-OR-MINUS 37.51 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1827.37 MB
 (N,2N) THRESHOLD = 8.99 MEV
 (N,3N) THRESHOLD = 15.28 MEV
 THIS ISOTOPE HAS 60 NEUTRONS, 44 PROTONS, (MASS = 104)
 NEUTRON EXCESS PARAMETER = .15385
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .8550 PLUS-OR-MINUS .0205
 T=SQRT(N) = 5.304 T=SQRT(A) = 10.932
 ERROR .449 ERROR .908

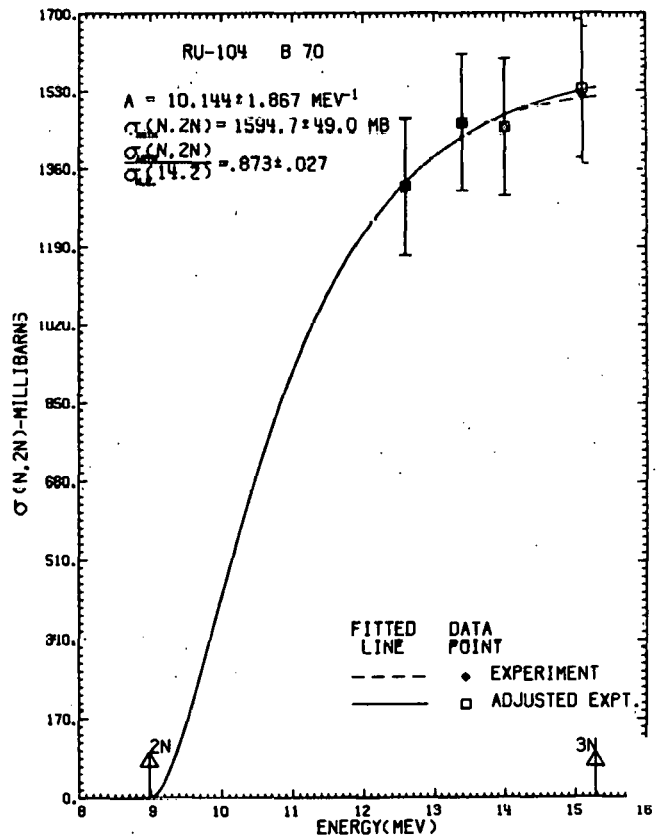


RU-104 ... FROM REF. B 70

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.600	1320.00 150.00	1320.000	150.000
13.400	1460.00 150.00	1460.000	150.000
14.000	1490.00 150.00	1490.000	150.000
15.100	1520.00 150.00	1535.440	151.524

FITTED PARAMETERS
 LEVEL SPACING = 10.144 PLUS-OR-MINUS 1.867 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1594.70 PLUS-OR-MINUS 48.98 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1827.37 MB
 (N,2N) THRESHOLD = 8.99 MEV
 (N,3N) THRESHOLD = 15.28 MEV
 THIS ISOTOPE HAS 60 NEUTRONS, 44 PROTONS, (MASS = 104)
 NEUTRON EXCESS PARAMETER = .15385
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .8727 PLUS-OR-MINUS .0268
 N/SPACING = 5.915 A/SPACING = 10.252
 ERROR 1.349 ERROR 1.887



RH-103 ... FROM REF. P 70

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
10.630	307.00 240.00	307.000 240.000	
10.860	530.00 293.00	530.000 293.000	
11.080	706.00 337.00	706.000 337.000	
11.280	576.00 314.00	576.000 314.000	
11.450	610.00 87.00	610.000 87.000	
11.530	662.00 80.00	662.000 80.000	
12.610	906.00 52.00	906.000 52.000	
13.050	1014.00 54.00	1014.000 54.000	
13.390	913.00 51.00	913.000 51.000	
13.810	974.00 53.00	974.000 53.000	
14.200	946.00 51.00	946.000 51.000	
14.610	319.00 47.00	923.459 47.228	
15.030	984.00 50.00	993.362 50.476	
15.400	1000.00 53.00	1013.376 53.709	
15.820	997.00 52.00	1014.444 52.910	
16.070	978.00 56.00	997.387 57.110	
16.190	1057.00 54.00	1079.005 55.124	
16.590	1063.00 54.00	1088.912 55.316	

FITTED PARAMETERS

NUCLEAR TEMP. = .936 PLUS-OR-MINUS .067 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1025.46 PLUS-OR-MINUS 17.70 MB

RELATED DATA

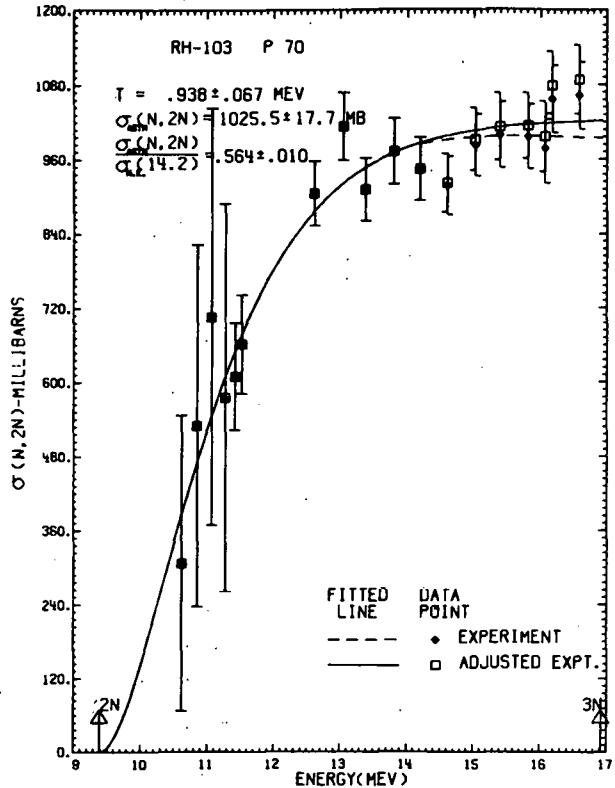
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1819.36 MB
 (N,2N) THRESHOLD = 9.40 MEV
 (N,3N) THRESHOLD = 16.92 MEV

THIS ISOTOPE HAS 58 NEUTRONS, 45 PROTONS, (MASS = 103)

NEUTRON EXCESS PARAMETER = .12621

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .5636 PLUS-OR-MINUS .0097

T*SQRT(K) = 7.144 T*SQRT(A) = 9.520
 ERROR .510 ERROR .680



RH-103 ... FROM REF. P 70

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
10.630	307.00 240.00	307.000 240.000	
10.860	530.00 293.00	530.000 293.000	
11.080	706.00 337.00	706.000 337.000	
11.280	576.00 314.00	576.000 314.000	
11.430	610.00 87.00	610.000 87.000	
11.530	662.00 80.00	662.000 80.000	
12.610	906.00 52.00	906.000 52.000	
13.050	1014.00 54.00	1014.000 54.000	
13.390	913.00 51.00	913.000 51.000	
13.810	974.00 53.00	974.000 53.000	
14.200	946.00 51.00	946.000 51.000	
14.610	319.00 47.00	923.459 47.228	
15.030	984.00 50.00	993.362 50.476	
15.400	1000.00 53.00	1013.376 53.709	
15.820	997.00 52.00	1014.444 52.910	
16.070	978.00 56.00	997.387 57.110	
16.190	1057.00 54.00	1079.005 55.124	
16.590	1063.00 54.00	1088.912 55.316	

FITTED PARAMETERS

LEVEL SPACING = 12.990 PLUS-OR-MINUS 1.899 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1042.59 PLUS-OR-MINUS 21.26 MB

RELATED DATA

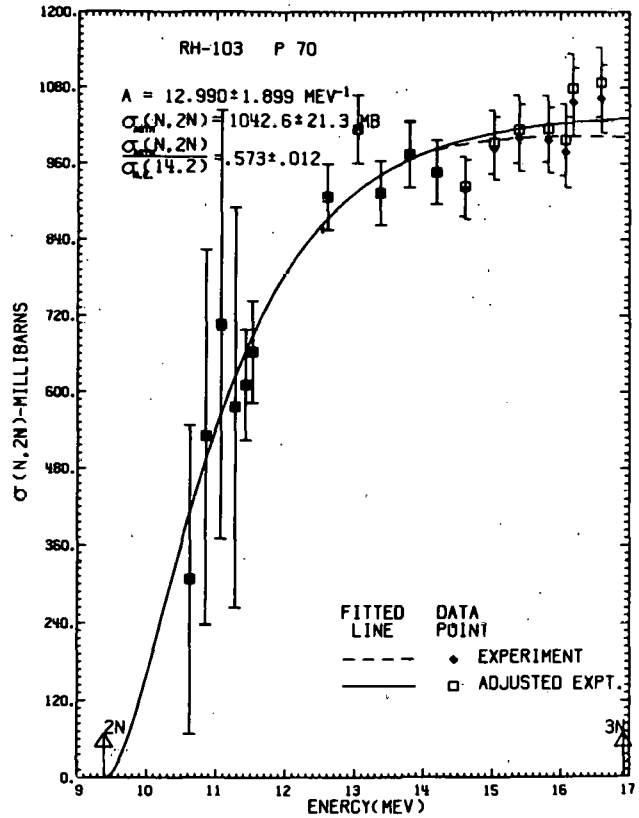
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1819.36 MB
 (N,2N) THRESHOLD = 9.40 MEV
 (N,3N) THRESHOLD = 16.92 MEV

THIS ISOTOPE HAS 58 NEUTRONS, 45 PROTONS, (MASS = 103)

NEUTRON EXCESS PARAMETER = .12621

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .5731 PLUS-OR-MINUS .0117

W/SPACING = 4.469 A/SPACING = 7.92V
 ERROR .653 ERROR 1.159

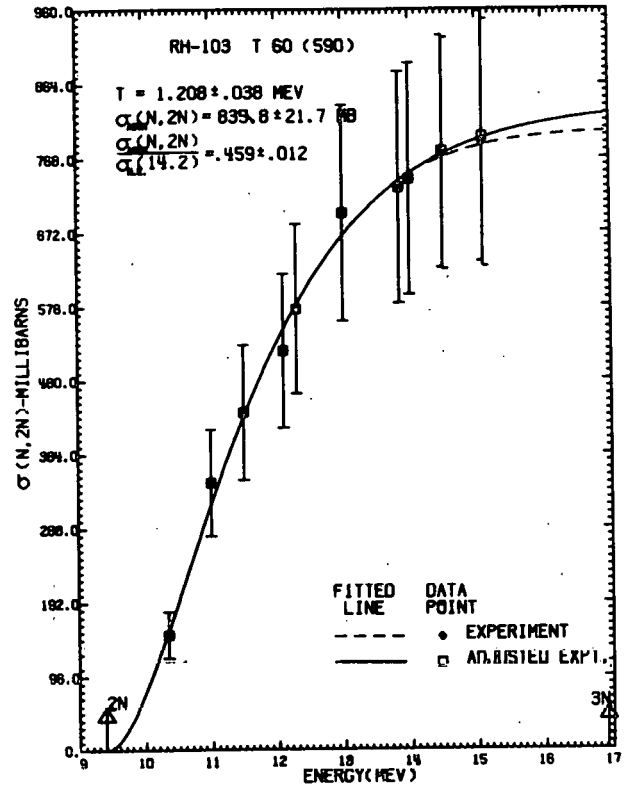


RH-103 ... FROM REF. T 60 (590)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
10.350	150.00	30.00	150.000	30.000
11.000	347.00	69.00	347.000	69.000
11.500	438.00	88.00	438.000	88.000
12.100	518.00	100.00	518.000	100.000
12.300	572.00	110.00	572.000	110.000
13.000	696.00	140.00	696.000	140.000
13.850	729.00	150.00	729.000	150.000
14.000	740.00	150.00	740.000	150.000
14.500	773.00	150.00	775.768	150.537
15.100	787.00	160.00	795.076	161.642

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.208 PLUS-OR-MINUS .038 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 835.77 PLUS-OR-MINUS 21.69 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1819.36 MB
 (N,2N) THRESHOLD = 9.40 MEV
 (N,3N) THRESHOLD = 16.92 MEV
 THIS ISOTOPE HAS 58 NEUTRONS, 45 PROTONS, (MASS = 103)
 NEUTRON EXCESS PARAMETER = .12621
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .4594 PLUS-OR-MINUS .0119
 T*SQRT(N) = 9.200 T*SQRT(A) = 12.260
 ERROR .289 ERROR .386

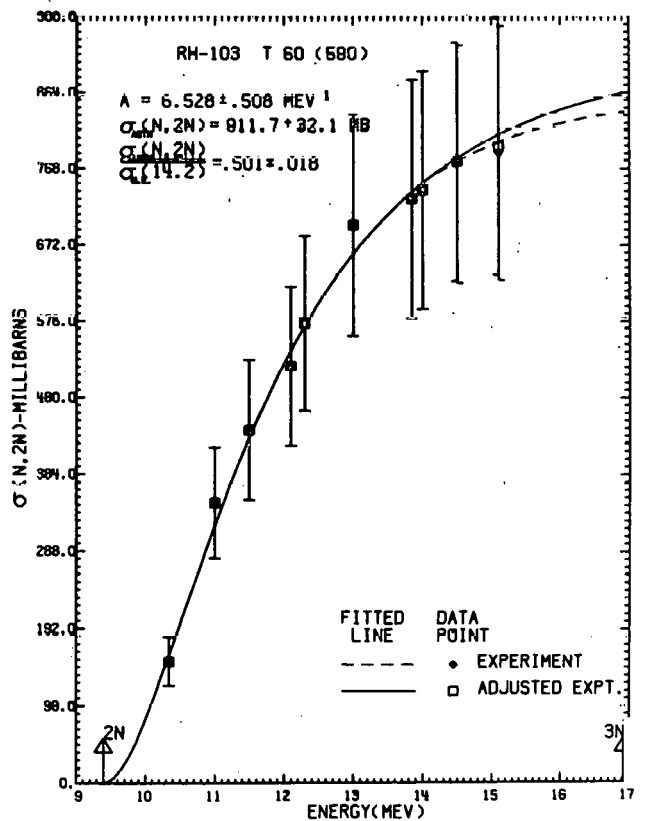


RH-103 ... FROM REF. T 60 (590)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
10.350	150.00	30.00	150.000	30.000
11.000	347.00	69.00	347.000	69.000
11.500	438.00	88.00	438.000	88.000
12.100	518.00	100.00	518.000	100.000
12.300	572.00	110.00	572.000	110.000
13.000	696.00	140.00	696.000	140.000
13.850	729.00	150.00	729.000	150.000
14.000	740.00	150.00	740.000	150.000
14.500	773.00	150.00	775.768	150.537
15.100	787.00	160.00	795.076	161.642

FITTED PARAMETERS
 LEVEL SPACING = 6.528 PLUS-OR-MINUS .508 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 911.69 PLUS-OR-MINUS 32.15 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1819.36 MB
 (N,2N) THRESHOLD = 9.40 MEV
 (N,3N) THRESHOLD = 16.92 MEV
 THIS ISOTOPE HAS 58 NEUTRONS, 45 PROTONS, (MASS = 103)
 NEUTRON EXCESS PARAMETER = .12621
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .5011 PLUS-OR-MINUS .0177
 N/SPACING = 8.885 A/SPACING = 15.778
 ERROR .691 ERROR 1.220

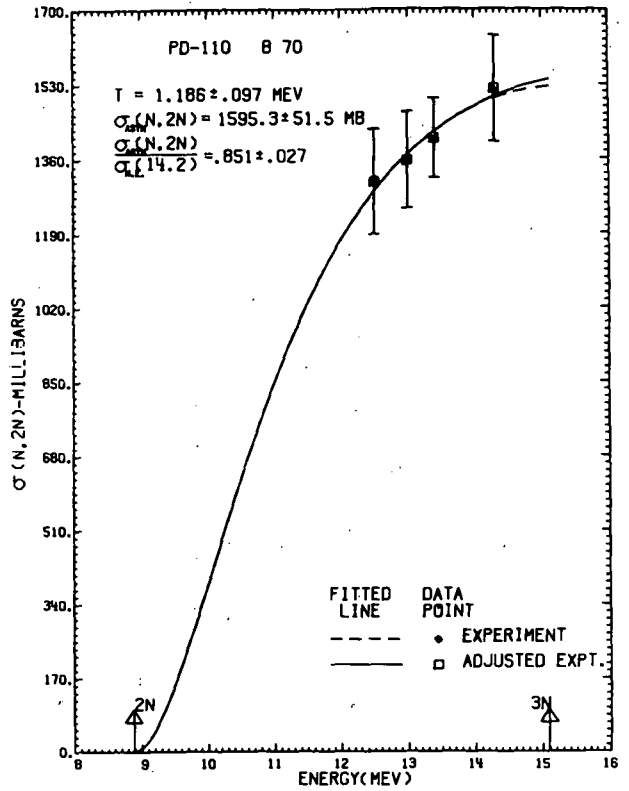


PD-110 ... FROM REF. B 70

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.500	1310.00 120.00	1310.000	120.000
13.000	1360.00 110.00	1360.000	110.000
13.400	1410.00 90.00	1410.000	90.000
14.300	1520.00 120.00	1521.720	120.136

FITTED PARAMETERS
 NUCLEAR LEVEL = 1.186 PLUS-OR-MINUS .097 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1595.35 PLUS-OR-MINUS 51.53 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1874.70 MB
 (N,2N) THRESHOLD = 8.89 MEV
 (N,3N) THRESHOLD = 15.09 MEV
 THIS ISOTOPE HAS 64 NEUTRONS, 46 PROTONS, (MASS = 110)
 NEUTRON EXCESS PARAMETER = .16364
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .851 PLUS-OR-MINUS .0275
 T*SQRT(N) = 9.428 T*SQRT(A) = 12.439
 ERROR = .776 ERROR = 1.017

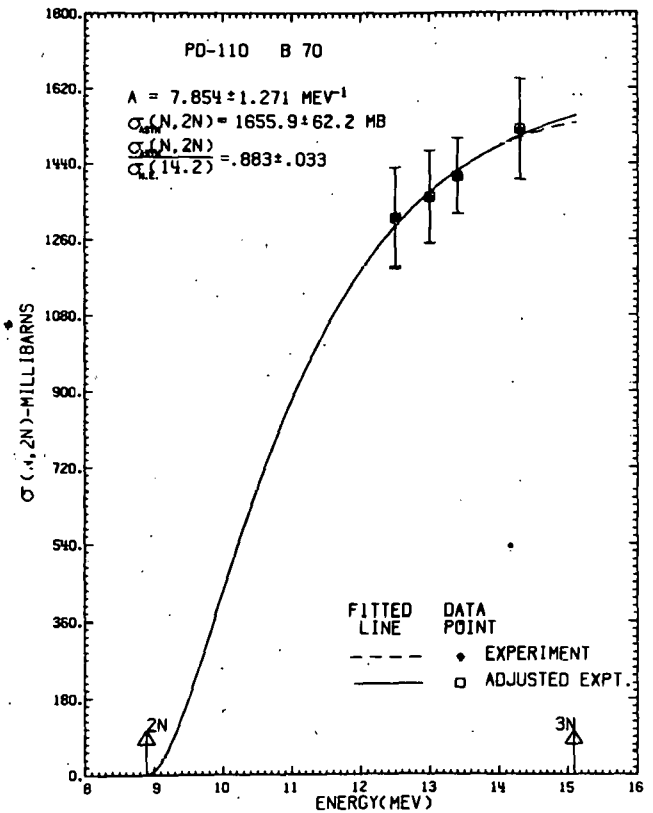


PD-110 ... FROM REF. B 70

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.500	1310.00 120.00	1310.000	120.000
13.000	1360.00 110.00	1360.000	110.000
13.400	1410.00 90.00	1410.000	90.000
14.300	1520.00 120.00	1521.720	120.136

FITTED PARAMETERS
 LEVEL SPACING = 7.854 PLUS-OR-MINUS 1.271 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1655.92 PLUS-OR-MINUS 62.16 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1874.70 MB
 (N,2N) THRESHOLD = 8.89 MEV
 (N,3N) THRESHOLD = 15.09 MEV
 THIS ISOTOPE HAS 64 NEUTRONS, 46 PROTONS, (MASS = 110)
 NEUTRON EXCESS PARAMETER = .16364
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .883 PLUS-OR-MINUS .0332
 N/SPACING = 8.149 A/SPACING = 14.006
 ERROR = 1.319 ERROR = 2.267

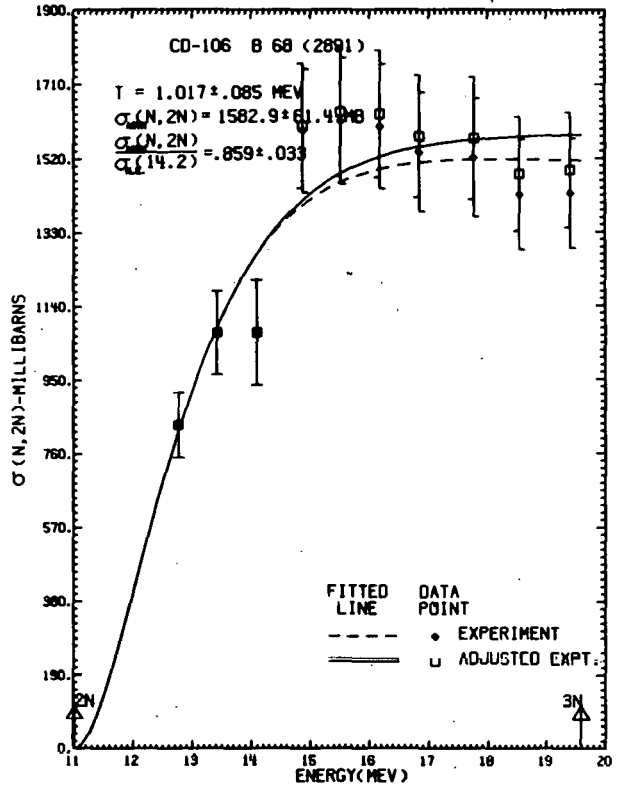


CD-106 ... FROM REF. B 68 (2891)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR		
12.780	834.00	84.00	834.000	84.000
13.440	1072.00	108.00	1072.000	108.000
14.110	1072.00	136.00	1072.000	136.000
14.870	1589.00	159.00	1600.986	160.199
15.520	1614.00	162.00	1636.813	164.290
16.180	1600.00	160.00	1632.257	163.226
16.850	1535.00	153.00	1574.374	156.925
17.780	1521.00	152.00	1570.167	156.914
18.560	1426.00	142.00	1478.990	147.277
19.420	1429.00	142.00	1488.683	147.931

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.017 PLUS-OR-MINUS .085 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1562.69 PLUS-OR-MINUS 61.41 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1643.29 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 19.60 MEV
 THIS ISOTOPE HAS 56 NEUTRONS, 48 PROTONS, (MASS = 106)
 NEUTRON EXCESS PARAMETER = .09434
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .9587 PLUS-OR-MINUS .0335
 TESPRT(N) = 7.745 TESPRT(A) = 10.4/1
 ERROR .647 ERROR .879

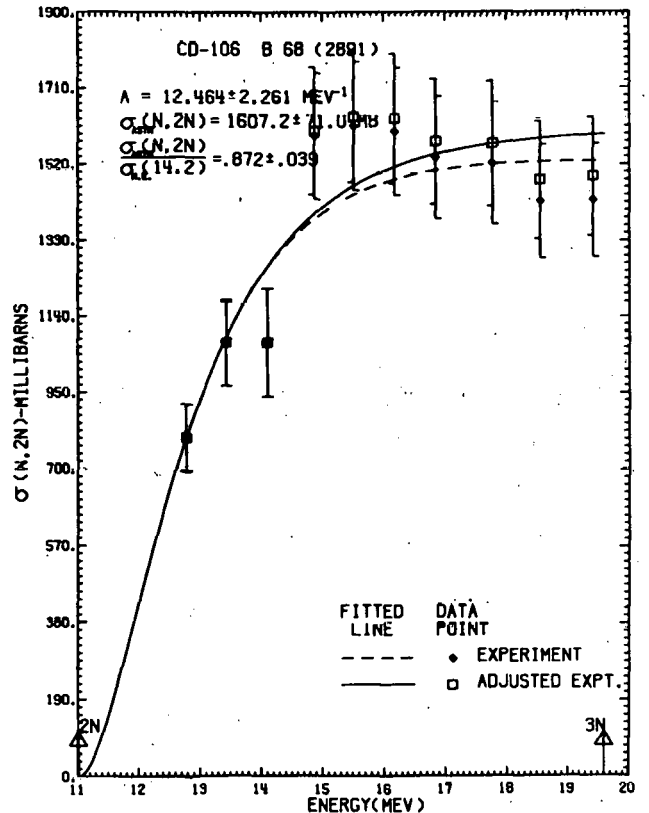


CD-106 ... FROM REF. B 68 (2891)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
	MEASURED	ERR		
12.780	834.00	84.00	834.000	84.000
13.440	1072.00	108.00	1072.000	108.000
14.110	1072.00	136.00	1072.000	136.000
14.870	1589.00	159.00	1600.986	160.199
15.520	1614.00	162.00	1636.813	164.290
16.180	1600.00	160.00	1632.257	163.226
16.850	1535.00	153.00	1574.374	156.925
17.780	1521.00	152.00	1570.167	156.914
18.560	1426.00	142.00	1478.990	147.277
19.420	1429.00	142.00	1488.683	147.931

FITTED PARAMETERS
 LEVEL SPACING = 12.464 PLUS-OR-MINUS 2.261 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1607.19 PLUS-OR-MINUS 70.99 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1643.29 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 19.60 MEV
 THIS ISOTOPE HAS 56 NEUTRONS, 48 PROTONS, (MASS = 106)
 NEUTRON EXCESS PARAMETER = .09434
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8719 PLUS-OR-MINUS .0389
 N/SPACING = 4.653 A/SPACING = 8.504
 ERROR .844 ERROR 1.543



CD-106 ... FROM REF. R 63 (2176)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED
12.300	476.00	48.00	476.000 48.000
12.900	385.00	39.00	385.000 39.000
13.100	532.00	53.00	532.000 53.000
13.500	621.00	62.00	621.000 62.000
14.000	640.00	64.00	640.000 64.000
14.300	819.00	82.00	819.964 82.097
14.600	953.00	95.00	957.383 95.437
14.900	980.00	98.00	987.705 98.771
15.200	956.00	96.00	966.492 97.054
15.700	909.00	91.00	923.400 92.442
16.000	939.00	94.00	956.447 95.747
16.300	1072.00	107.00	1094.714 109.267
17.300	990.00	99.00	1018.721 101.872
17.800	1044.00	104.00	1077.886 107.376

FITTED PARAMETERS

NUCLEAR TEMP. = 1.286 PLUS-OR-MINUS .149 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1101.52 PLUS-OR-MINUS 92.99 MB

RELATED DATA

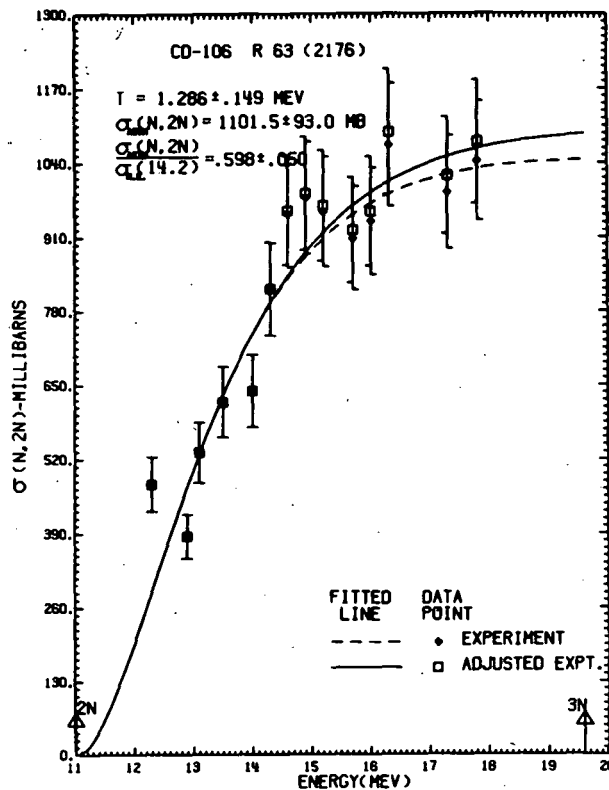
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1843.29 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 19.60 MEV

THIS ISOTOPE HAS 58 NEUTRONS, 48 PROTONS, (MASS = 106)

NEUTRON EXCESS PARAMETER = .09434

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5976 PLUS-OR-MINUS .0504

T*SQRT(N) = 9.794 T*SQRT(A) = 13.240
 ERROR 1.135 ERROR 1.534



CD-106 ... FROM REF. R 63 (2176)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED
12.300	476.00	48.00	476.000 48.000
12.900	385.00	39.00	385.000 39.000
13.100	532.00	53.00	532.000 53.000
13.500	621.00	62.00	621.000 62.000
14.000	640.00	64.00	640.000 64.000
14.300	819.00	82.00	819.964 82.097
14.600	953.00	95.00	957.383 95.437
14.900	980.00	98.00	987.705 98.771
15.200	956.00	96.00	966.492 97.054
15.700	909.00	91.00	923.400 92.442
16.000	939.00	94.00	956.447 95.747
16.300	1072.00	107.00	1094.714 109.267
17.300	990.00	99.00	1018.721 101.872
17.800	1044.00	104.00	1077.886 107.376

FITTED PARAMETERS

LEVEL SPACING = 7.206 PLUS-OR-MINUS 1.818 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1166.10 PLUS-OR-MINUS 110.15 MB

RELATED DATA

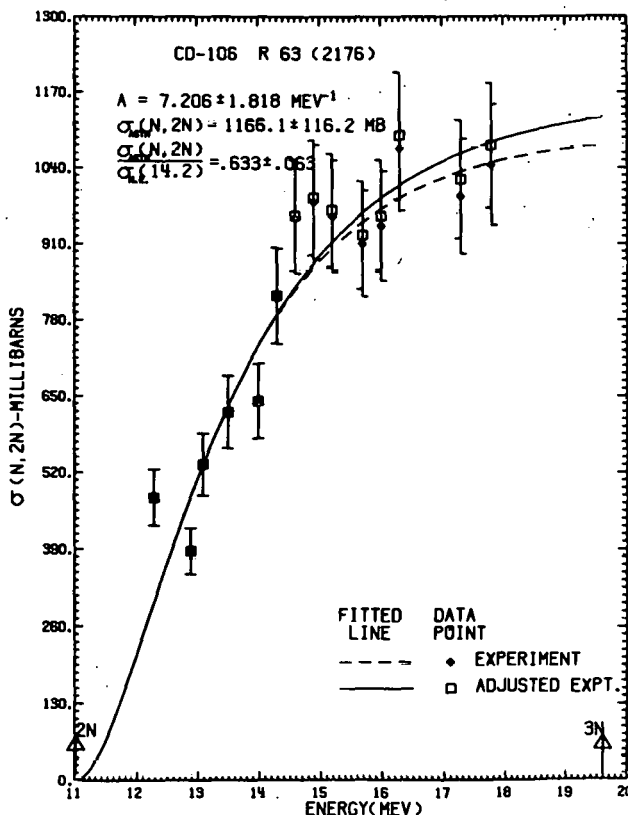
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1843.29 MB
 (N,2N) THRESHOLD = 11.02 MEV
 (N,3N) THRESHOLD = 19.60 MEV

THIS ISOTOPE HAS 58 NEUTRONS, 48 PROTONS, (MASS = 106)

NEUTRON EXCESS PARAMETER = .09434

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6326 PLUS-OR-MINUS .0630

N/SPACING = 8.049 A/SPACING = 14.710
 ERROR 2.031 ERROR 3.711

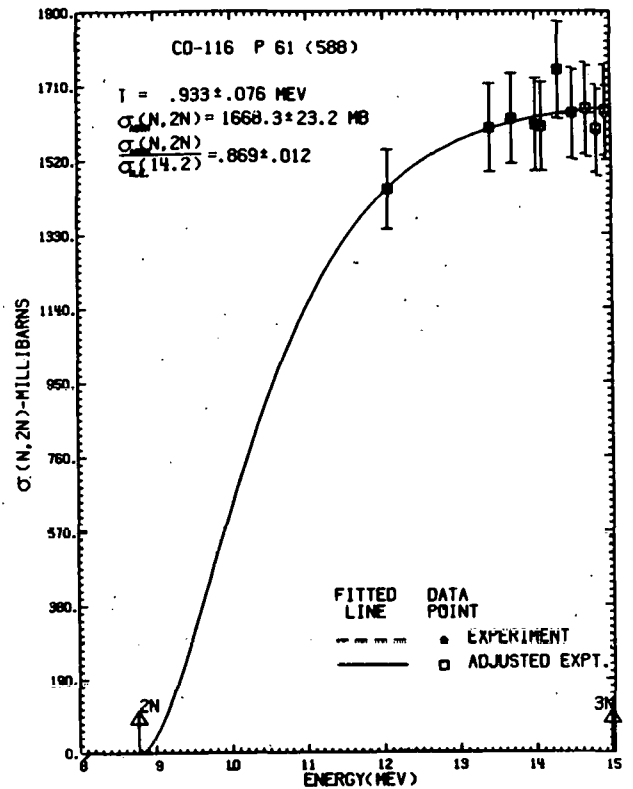


CD-116 ... FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.060	1442.00	102.00	1442.000	102.000	
13.400	1601.00	113.00	1601.000	113.000	
13.690	1625.00	119.00	1625.000	119.000	
14.010	1609.00	119.00	1609.000	119.000	
14.090	1604.00	114.00	1604.000	114.000	
14.310	1748.00	124.00	1750.091	124.146	
14.500	1634.00	116.00	1639.148	116.365	
14.680	1642.00	117.00	1650.154	117.581	
14.810	1588.00	112.00	1597.914	112.699	
14.930	1634.00	116.00	1646.088	116.858	

FITTED PARAMETERS
 NUCLEAR TEMP. = .933 PLUS-OR-MINUS .076 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1668.32 PLUS-OR-MINUS 23.22 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1920.83 MB
 (N,2N) THRESHOLD = 8.77 MEV
 (N,3N) THRESHOLD = 14.97 MEV
 THIS ISOTOPE HAS 88 NEUTRONS, 88 PROTONS, (MASS = 116)
 NEUTRON EXCESS PARAMETER = .17241
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .8685 PLUS-OR-MINUS .0121
 Y=SQRT(N) = 7.694 I=SQRT(A) = 10.099
 ERROR .027 ERROR .819

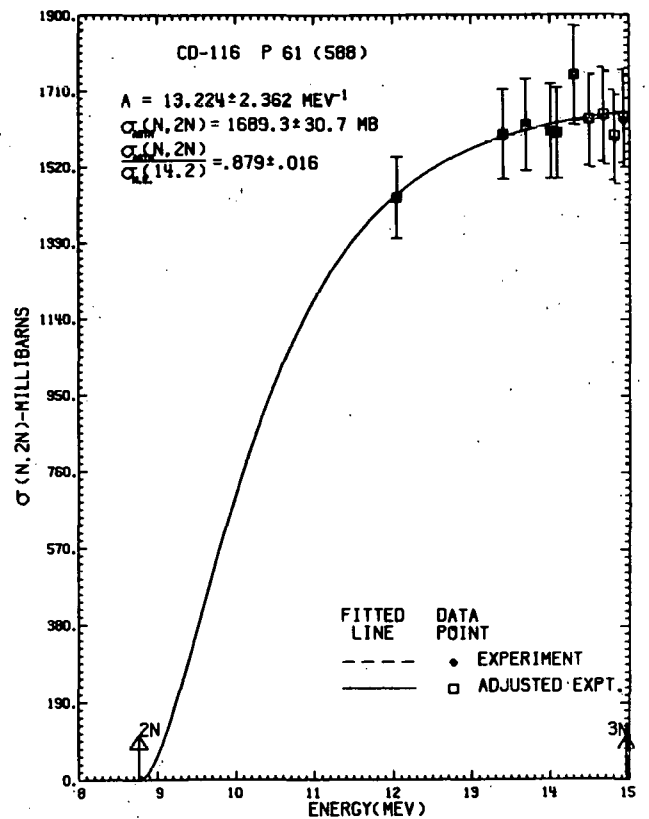


CD-116 ... FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.060	1442.00	102.00	1442.000	102.000	
13.400	1601.00	113.00	1601.000	113.000	
13.690	1625.00	119.00	1625.000	119.000	
14.010	1609.00	119.00	1609.000	119.000	
14.090	1604.00	114.00	1604.000	114.000	
14.310	1748.00	124.00	1750.091	124.146	
14.500	1634.00	116.00	1639.148	116.365	
14.680	1642.00	117.00	1650.154	117.581	
14.810	1588.00	112.00	1597.914	112.699	
14.930	1634.00	116.00	1646.088	116.858	

FITTED PARAMETERS
 LEVEL SPACING = 13.224 PLUS-OR-MINUS 2.362 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1689.34 PLUS-OR-MINUS 30.68 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1920.83 MB
 (N,2N) THRESHOLD = 8.77 MEV
 (N,3N) THRESHOLD = 14.97 MEV
 THIS ISOTOPE HAS 68 NEUTRONS, 48 PROTONS, (MASS = 116)
 NEUTRON EXCESS PARAMETER = .17241
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .8795 PLUS-OR-MINUS .0160
 N/SPACING = 5.142 A/SPACING = 8.772
 ERROR .918 ERROR 1.567



IN-113 ...FROM REF. G 70

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.980	1369.00	137.00	1369.000 137.000
13.330	1356.00	68.00	1356.000 68.000
13.860	1503.00	74.00	1503.000 74.000
14.920	1527.00	56.00	1532.276 56.193
15.170	1557.00	37.00	1572.471 37.368
15.440	1725.00	49.00	1746.440 49.609
15.980	1489.00	99.00	1514.444 100.692
16.280	1377.00	101.00	1403.847 102.969
16.870	1462.00	219.00	1496.922 224.231

FITTED PARAMETERS

NUCLEAR TEMP. = 1.159 PLUS-OR-MINUS .220 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1665.80 PLUS-OR-MINUS 81.09 MB

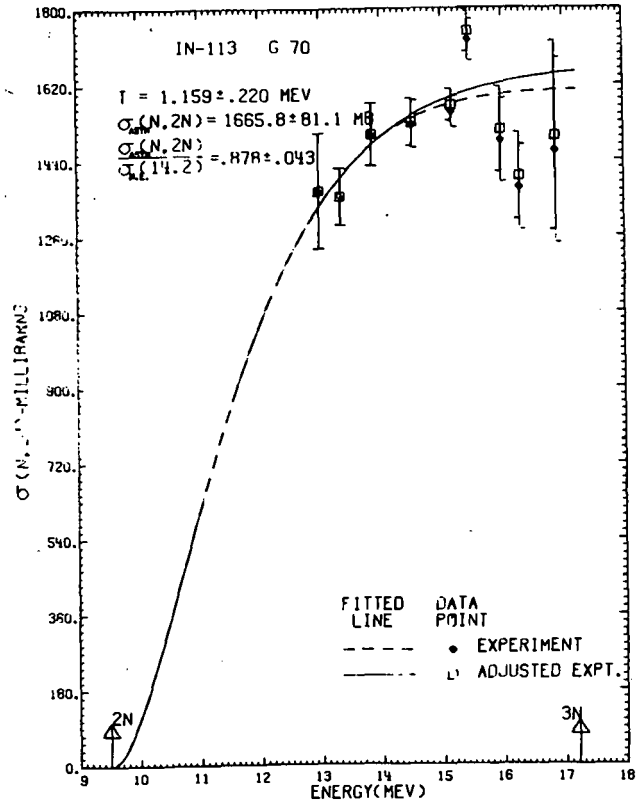
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1697.90 MB
 (N,2N) THRESHOLD = 9.21 MEV
 (N,3N) THRESHOLD = 17.21 MEV

THIS ISOTOPE HAS 64 NEUTRONS, 49 PROTONS, (MASS = 113)
 NEUTRON EXCESS PARAMETER = .14274

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8777 PLUS-OR-MINUS .0427

T=SCPT(N) = 7.272 T=SLRT(A) = 12.320
 ERROR 1.760 ERROR 2.339



IN-113 ...FROM REF. G 70

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.980	1369.00	137.00	1369.000 137.000
13.330	1356.00	68.00	1356.000 68.000
13.860	1503.00	74.00	1503.000 74.000
14.920	1527.00	56.00	1532.276 56.193
15.170	1557.00	37.00	1572.471 37.368
15.440	1725.00	49.00	1746.440 49.609
15.980	1489.00	99.00	1514.444 100.692
16.280	1377.00	101.00	1403.847 102.969
16.870	1462.00	219.00	1496.922 224.231

FITTED PARAMETERS

LEVEL SPACING = 0.254 PLUS-OR-MINUS 3.936 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1700.65 PLUS-OR-MINUS 110.37 MB

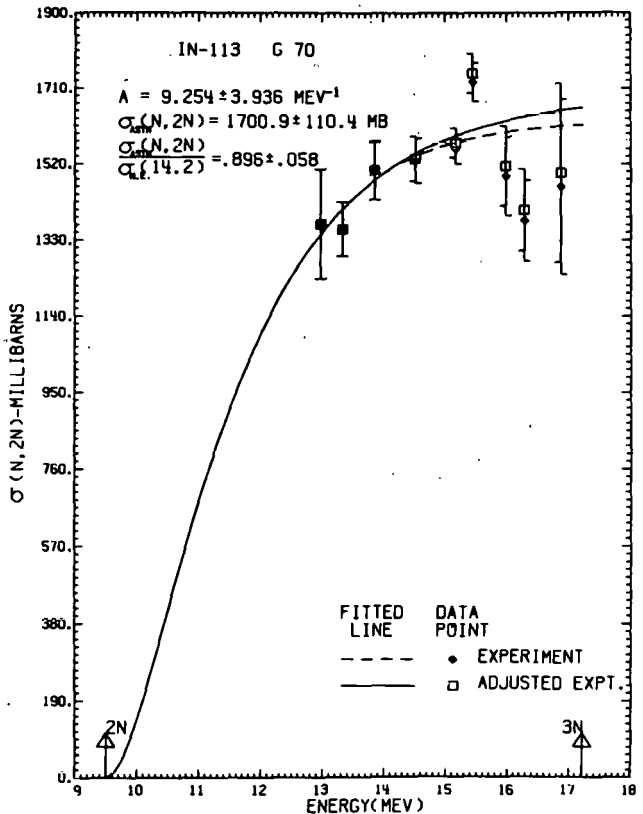
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1697.90 MB
 (N,2N) THRESHOLD = 9.21 MEV
 (N,3N) THRESHOLD = 17.21 MEV

THIS ISOTOPE HAS 64 NEUTRONS, 49 PROTONS, (MASS = 113)
 NEUTRON EXCESS PARAMETER = .14274

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8962 PLUS-OR-MINUS .0582

V/SPACING = 5.916 A/SPACING = 12.211
 ERROR 2.942 ERROR 5.194

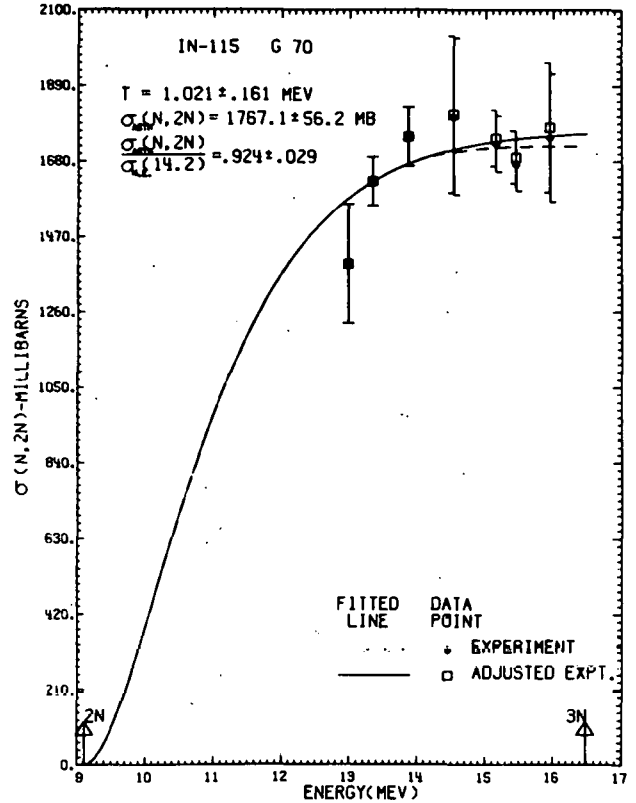


IN-115 ...FROM REF. G 70

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED
12.960	1394.00	166.00	1394.000 166.000
13.330	1623.00	68.00	1623.000 68.000
13.860	1748.00	82.00	1748.000 82.000
14.520	1803.00	218.00	1809.108 218.739
15.150	1727.00	78.00	1743.495 78.745
15.440	1670.00	73.00	1690.333 73.889
15.950	1745.00	178.00	1773.771 180.935

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.021 PLUS-OR-MINUS .161 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1767.09 PLUS-OR-MINUS 56.22 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1913.22 MB
 (N,2N) THRESHOLD = 9.11 MEV
 (N,3N) THRESHOLD = 16.48 MEV
 THIS ISOTOPE HAS 66 NEUTRONS, 49 PROTONS, (MASS = 115)
 NEUTRON EXCESS PARAMETER = .14783
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .9236 PLUS-OR-MINUS .0294
 T*SQRT(N) = 8.295 ERROR 1.308
 T*SQRT(A) = 10.949 ERROR 1.727

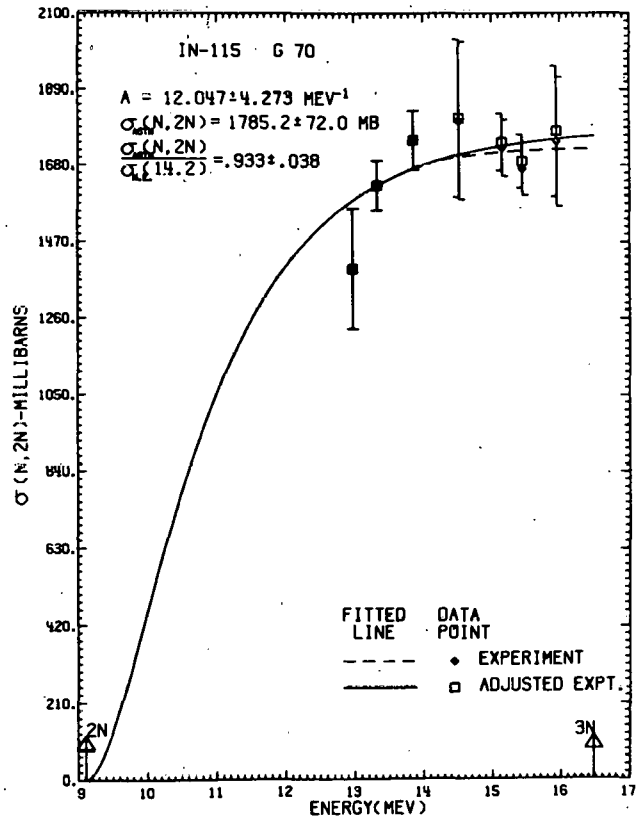


IN-115 ...FROM REF. G 70

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED
12.960	1394.00	166.00	1394.000 166.000
13.330	1623.00	68.00	1623.000 68.000
13.860	1748.00	82.00	1748.000 82.000
14.520	1803.00	218.00	1809.108 218.739
15.150	1727.00	78.00	1743.495 78.745
15.440	1670.00	73.00	1690.333 73.889
15.950	1745.00	178.00	1773.771 180.935

FITTED PARAMETERS
 LEVEL SPACING = 12.047 PLUS-OR-MINUS 4.273 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1785.17 PLUS-OR-MINUS 71.96 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1913.22 MB
 (N,2N) THRESHOLD = 9.11 MEV
 (N,3N) THRESHOLD = 16.48 MEV
 THIS ISOTOPE HAS 66 NEUTRONS, 49 PROTONS, (MASS = 115)
 NEUTRON EXCESS PARAMETER = .14783
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .9331 PLUS-OR-MINUS .0376
 N/SPACING = 5.479 ERROR 1.943
 A/SPACING = 9.546 ERROR 3.386

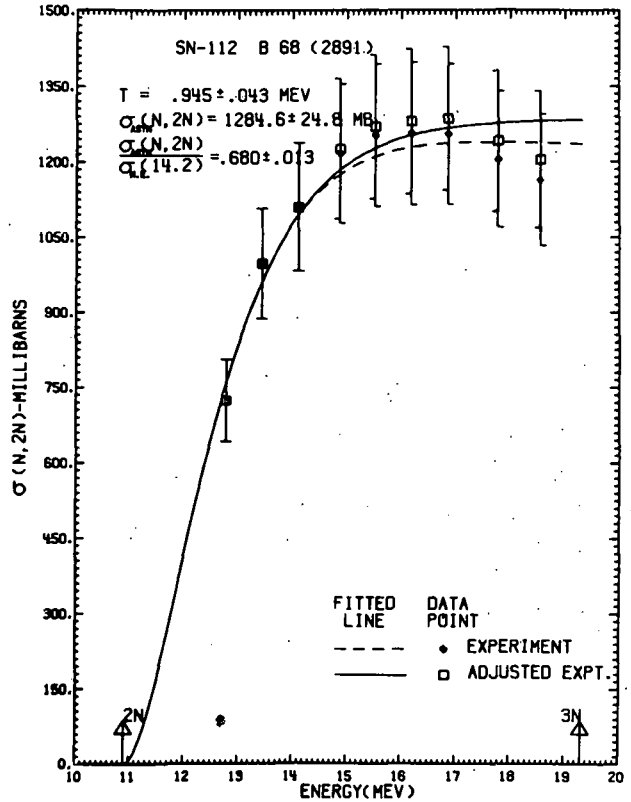


SN-112 ... FROM REF. B 68 (2891)

ENERGY (MEV)	MEASURED, ERR		N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
12.780	724.00	82.00	724.000	82.000		
13.440	998.00	110.00	998.000	110.000		
14.110	1110.00	127.00	1110.000	127.000		
14.870	1217.00	138.00	1225.644	138.980		
15.520	1253.00	141.00	1269.644	142.873		
16.180	1256.00	141.00	1279.749	143.666		
16.850	1255.00	139.00	1265.131	142.337		
17.780	1205.00	135.00	1241.351	139.073		
18.560	1164.00	131.00	1204.264	135.531		

FITTED PARAMETERS
 NUCLEAR TEMP. = .945 PLUS-OR-MINUS .043 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1204.39 PLUS-OR-MINUS 24.82 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1090.20 MB
 (N,2N) THRESHOLD = 10.90 MEV
 (N,3N) THRESHOLD = 19.30 MEV
 THIS ISOTOPE HAS 62 NEUTRONS, 50 PROTONS, (MASS = 112)
 NEUTRON EXCESS PARAMETER = .10714
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6796 PLUS-OR-MINUS .0131
 T=SQRT(N) = 7.441 T=SQRT(A) = 10.001
 ERROR .339 ERROR .455

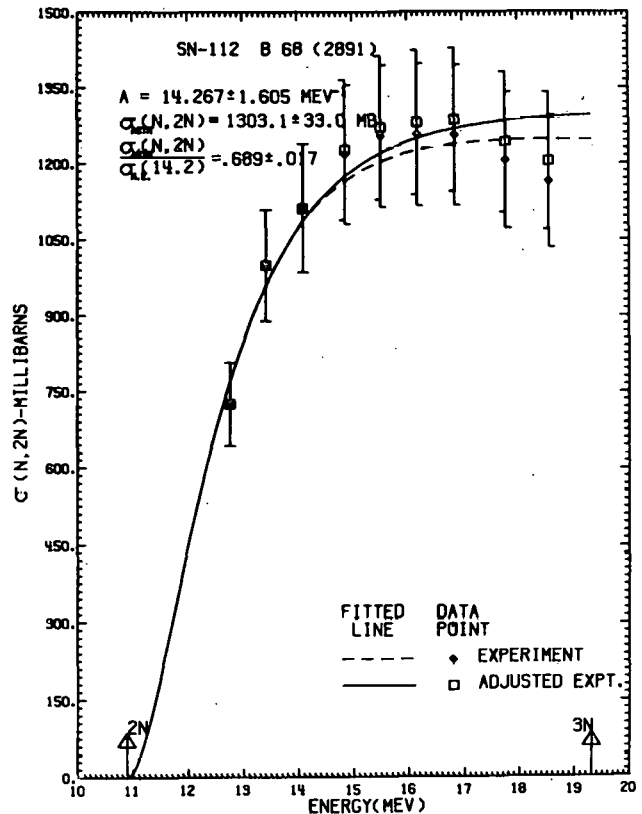


SN-112 ... FROM REF. B 68 (2891)

ENERGY (MEV)	MEASURED, ERR		N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
12.780	724.00	82.00	724.000	82.000		
13.440	998.00	110.00	998.000	110.000		
14.110	1110.00	127.00	1110.000	127.000		
14.870	1217.00	138.00	1225.644	138.980		
15.520	1253.00	141.00	1269.644	142.873		
16.180	1256.00	141.00	1279.749	143.666		
16.850	1255.00	139.00	1265.131	142.337		
17.780	1205.00	135.00	1241.351	139.073		
18.560	1164.00	131.00	1204.264	135.531		

FITTED PARAMETERS
 LEVEL SPACING = 14.267 PLUS-OR-MINUS 1.605 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1303.05 PLUS-OR-MINUS 33.04 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1090.20 MB
 (N,2N) THRESHOLD = 10.90 MEV
 (N,3N) THRESHOLD = 19.30 MEV
 THIS ISOTOPE HAS 62 NEUTRONS, 50 PROTONS, (MASS = 112)
 NEUTRON EXCESS PARAMETER = .10714
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6894 PLUS-OR-MINUS .0175
 N/SPACING = 4.346 A/SPACING = 7.850
 ERROR .489 ERROR .883



SN-112 ...FROM REF. R 63 (2182)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.300	760.00 76.00	760.000 76.000	
12.900	1082.00 108.00	1082.000 108.000	
13.300	1080.00 108.00	1080.000 108.000	
13.800	1166.00 117.00	1166.000 117.000	
14.100	1466.00 147.00	1466.000 147.000	
14.400	1515.00 152.00	1518.336 152.335	
14.900	1676.00 168.00	1688.407 169.244	
15.200	1653.00 165.00	1670.065 166.703	
15.700	1810.00 181.00	1836.932 183.693	
16.000	1880.00 188.00	1912.780 191.278	
16.400	1804.00 180.00	1841.250 183.717	
16.800	1876.00 188.00	1920.363 192.446	
17.200	1732.00 173.00	1777.805 177.575	
17.500	1900.00 190.00	1953.996 195.400	
17.800	2064.00 206.00	2126.516 212.239	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.172 PLUS-OR-MINUS .075 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1945.85 PLUS-OR-MINUS 73.32 MB

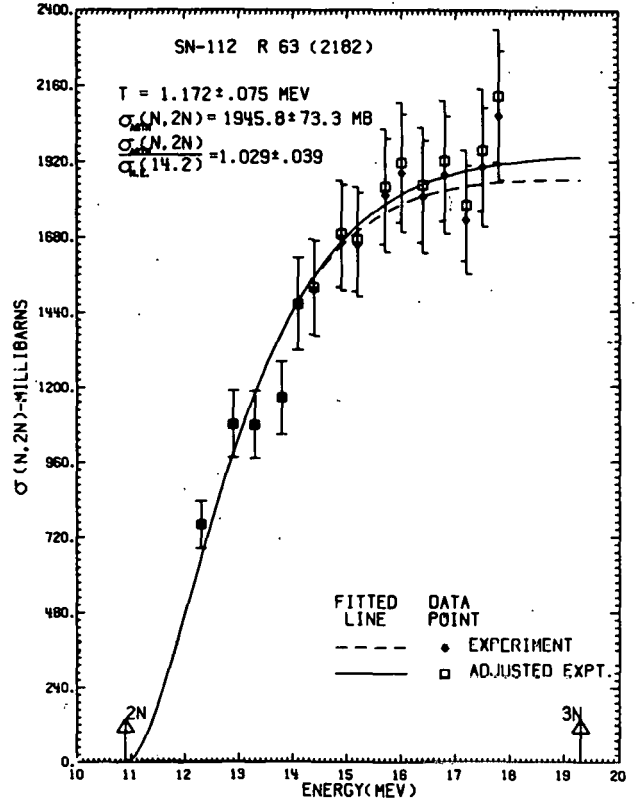
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1890.20 MB
 (N,2N) THRESHOLD = 10.90 MEV
 (N,3N) THRESHOLD = 19.30 MEV

THIS ISOTOPE HAS 62 NEUTRONS, 50 PROTONS, (MASS = 112)
 NEUTRON EXCESS PARAMETER = .10714

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.0294 PLUS-OR-MINUS .0388

T*SQRT(N) = 9.228 1*SQRT(A) = 12.403
 ERROR .591 ERROR .794



SN-112 ...FROM REF. R 63 (2182)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.300	760.00 76.00	760.000 76.000	
12.900	1082.00 108.00	1082.000 108.000	
13.300	1080.00 108.00	1080.000 108.000	
13.800	1166.00 117.00	1166.000 117.000	
14.100	1466.00 147.00	1466.000 147.000	
14.400	1515.00 152.00	1518.336 152.335	
14.900	1676.00 168.00	1688.407 169.244	
15.200	1653.00 165.00	1670.065 166.703	
15.700	1810.00 181.00	1836.932 183.693	
16.000	1880.00 188.00	1912.780 191.278	
16.400	1804.00 180.00	1841.250 183.717	
16.800	1876.00 188.00	1920.363 192.446	
17.200	1732.00 173.00	1777.805 177.575	
17.500	1900.00 190.00	1953.996 195.400	
17.800	2064.00 206.00	2126.516 212.239	

FITTED PARAMETERS

LEVEL SPACING = 8.779 PLUS-OR-MINUS 1.115 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2029.97 PLUS-OR-MINUS 83.00 MB

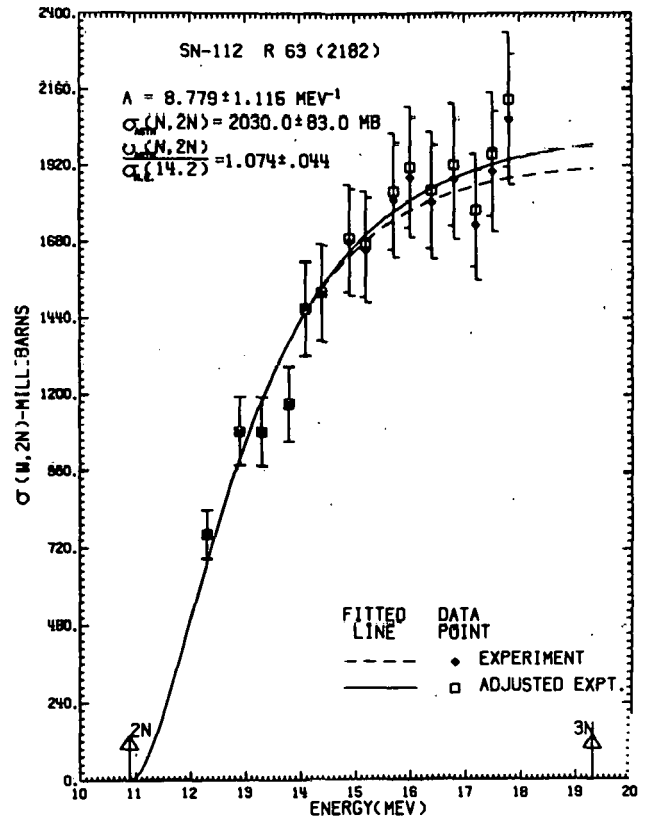
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1890.20 MB
 (N,2N) THRESHOLD = 10.90 MEV
 (N,3N) THRESHOLD = 19.30 MEV

THIS ISOTOPE HAS 62 NEUTRONS, 50 PROTONS, (MASS = 112)
 NEUTRON EXCESS PARAMETER = .10714

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.0739 PLUS-OR-MINUS .0439

N/SPACING = 7.062 A/SPACING = 12.758
 ERROR .897 ERROR 1.620



SN-112 ...FROM REF. P 61 (588)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED	ERR	ADJUSTED	ERR
12.800	512.00	100.00	512.000	100.000
13.330	1116.00	56.00	1116.000	56.000
13.400	1077.00	54.00	1077.000	54.000
13.520	1098.00	55.00	1098.000	55.000
13.690	1114.00	56.00	1114.000	56.000
14.010	1106.00	55.00	1106.000	55.000
14.090	1272.00	64.00	1272.000	64.000
14.310	1128.00	56.00	1129.376	56.068
14.560	1309.00	65.00	1313.289	65.213
14.680	1260.00	63.00	1266.510	63.326
14.810	1297.00	65.00	1309.427	65.422
14.930	1214.00	61.00	1223.349	61.470
16.500	1339.00	134.00	1367.678	136.870
17.950	1259.00	126.00	1298.263	129.929

FITTED PARAMETERS
 NUCLEAR TEMP. = .900 PLUS-OR-MINUS .111 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1364.42 PLUS-OR-MINUS 74.98 MB

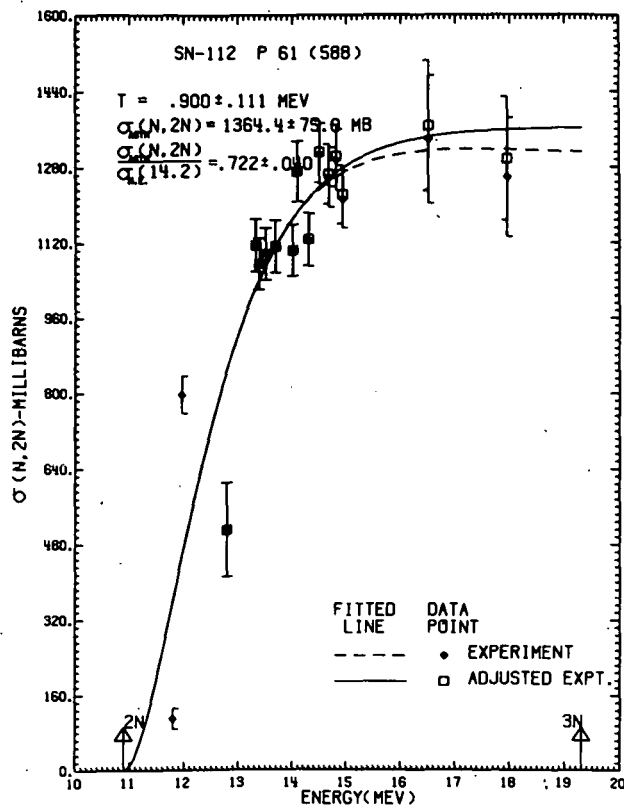
RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1890.20 MB
 (N,2N) THRESHOLD = 10.90 MEV
 (N,3N) THRESHOLD = 19.30 MEV

THIS ISOTOPE HAS 62 NEUTRONS, 50 PROTONS, (MASS = 112)

NEUTRON EXCESS PARAMETER = .10714

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7218 PLUS-OR-MINUS .0397

T=SURT(N) = 7.087 T=SURT(A) = 9.923
 ERROR .874 ERROR 1.175



SN-112 ...FROM REF. P 61 (588)

ENERGY (MEV)	N,2N CROSS SECTION (MB)		N,2N CROSS SECTION (MB)	
	MEASURED	ERR	ADJUSTED	ERR
12.800	512.00	100.00	512.000	100.000
13.330	1116.00	56.00	1116.000	56.000
13.400	1077.00	54.00	1077.000	54.000
13.520	1098.00	55.00	1098.000	55.000
13.690	1114.00	56.00	1114.000	56.000
14.010	1106.00	55.00	1106.000	55.000
14.090	1272.00	64.00	1272.000	64.000
14.310	1128.00	56.00	1129.376	56.068
14.560	1309.00	65.00	1313.289	65.213
14.680	1260.00	63.00	1266.510	63.326
14.810	1297.00	65.00	1309.427	65.422
14.930	1214.00	61.00	1223.349	61.470
16.500	1339.00	134.00	1367.678	136.870
17.950	1259.00	126.00	1298.263	129.929

FITTED PARAMETERS
 LEVEL SPACING = 15.480 PLUS-OR-MINUS 4.110 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1396.35 PLUS-OR-MINUS 90.26 MB

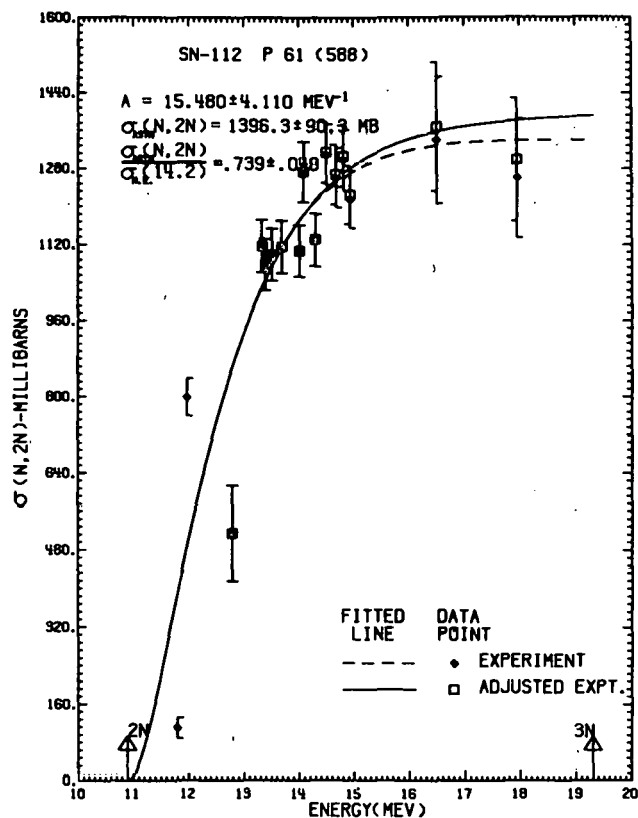
RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1890.20 MB
 (N,2N) THRESHOLD = 10.90 MEV
 (N,3N) THRESHOLD = 19.30 MEV

THIS ISOTOPE HAS 62 NEUTRONS, 50 PROTONS, (MASS = 112)

NEUTRON EXCESS PARAMETER = .10714

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7387 PLUS-OR-MINUS .0478

N/SPACING = 4.005 A/SPACING = 7.235
 ERROR 1.063 ERROR 1.921



SB-121 ...FROM REF. B 68 (2891)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.780	1369.00	93.00	1369.000	93.000	
13.440	1520.00	102.00	1520.000	102.000	
14.110	1546.00	107.00	1546.000	107.000	
14.870	1709.00	115.00	1720.091	115.746	
15.520	1759.00	119.00	1780.285	120.440	
16.180	1777.00	119.00	1807.512	121.043	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.354 PLUS-OR-MINUS .078 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1866.13 PLUS-OR-MINUS 46.75 MB

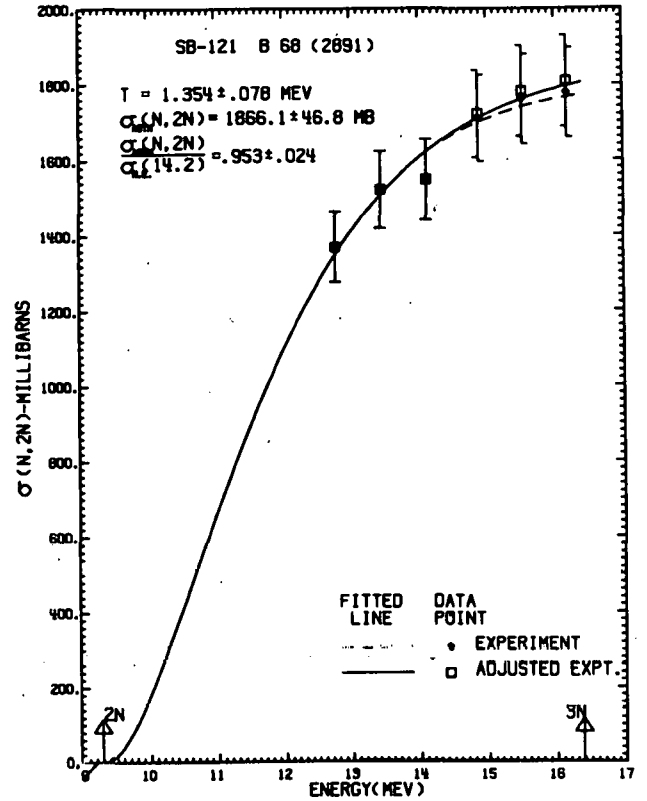
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1958.45 MB
 (N,2N) THRESHOLD = 9.32 MEV
 (N,3N) THRESHOLD = 16.38 MEV

THIS ISOTOPE HAS 70 NEUTRONS, 51 PROTONS, (MASS = 121)
 NEUTRON EXCESS PARAMETER = .15702

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .9530 PLUS-OR-MINUS .0219

T*SQRT(N) = 11.32b T*SQRT(A) = 14.894
 ERROR .653 ERROR .858



SB-121 ...FROM REF. B 68 (2891)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.780	1369.00	93.00	1369.000	93.000	
13.440	1520.00	102.00	1520.000	102.000	
14.110	1546.00	107.00	1546.000	107.000	
14.870	1709.00	115.00	1720.091	115.746	
15.520	1759.00	119.00	1780.285	120.440	
16.180	1777.00	119.00	1807.512	121.043	

FITTED PARAMETERS

LEVEL SPACING = 6.281 PLUS-OR-MINUS .742 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1946.88 PLUS-OR-MINUS 58.11 MB

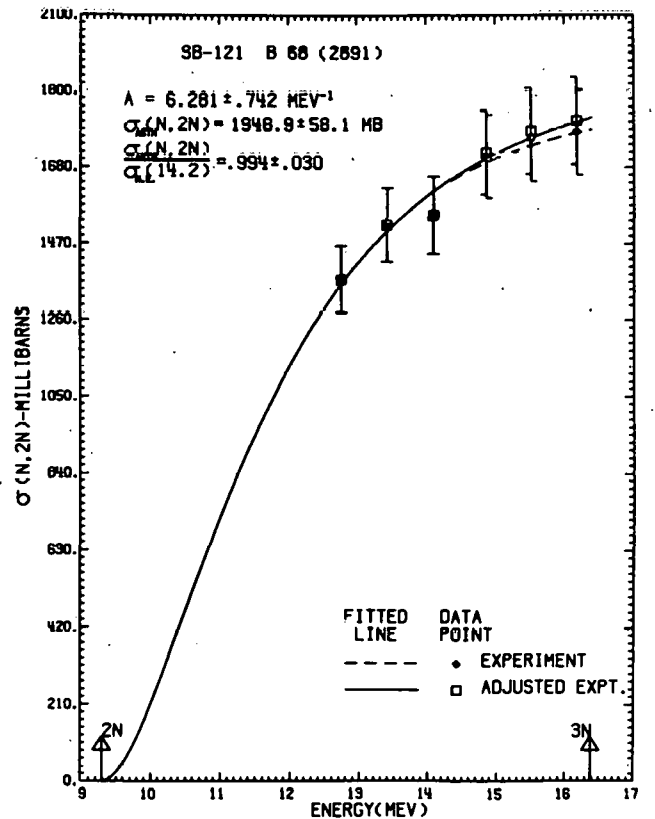
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1958.45 MB
 (N,2N) THRESHOLD = 9.32 MEV
 (N,3N) THRESHOLD = 16.38 MEV

THIS ISOTOPE HAS 70 NEUTRONS, 51 PROTONS, (MASS = 121)
 NEUTRON EXCESS PARAMETER = .15702

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .9941 PLUS-OR-MINUS .0297

N/SPACING = 11.145 A/SPACING = 19.264
 ERROR 1.317 ERROR 2.276

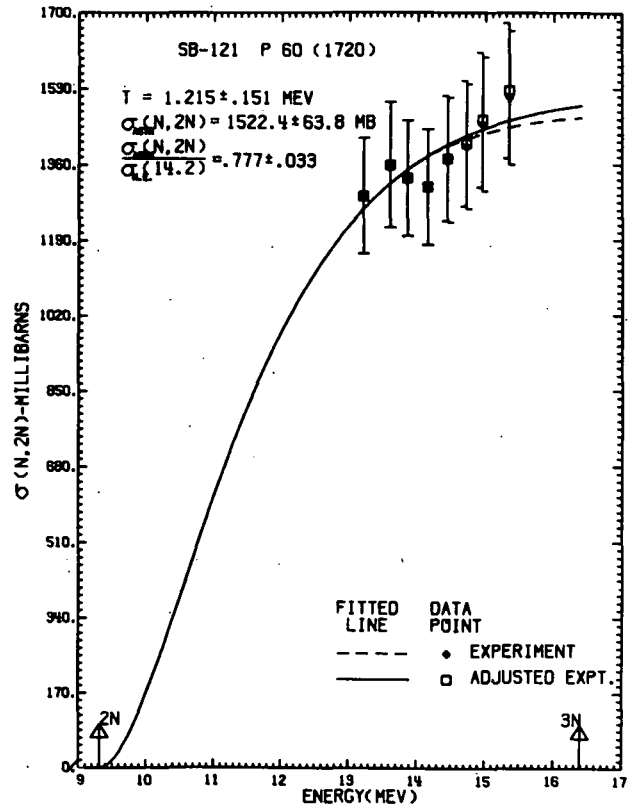


SB-121 ... FROM REF. P 60 (1720)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.200	1290.00	130.00	1290.000 130.000
13.599	1360.00	140.00	1360.000 140.000
13.850	1330.00	130.00	1330.000 130.000
14.140	1310.00	130.00	1310.000 130.000
14.430	1370.00	140.00	1373.169 140.324
14.710	1400.00	140.00	1407.011 140.701
14.950	1450.00	150.00	1460.462 151.082
15.340	1510.00	150.00	1526.022 151.592

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.215 PLUS-OR-MINUS .151 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1522.37 PLUS-OR-MINUS 63.75 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1958.45 MB
 (N,2N) THRESHOLD = 9.32 MEV
 (N,3N) THRESHOLD = 16.38 MEV
 THIS ISOTOPE HAS 70 NEUTRONS, 51 PROTONS, (MASS = 121)
 NEUTRON EXCESS PARAMETER = .19702
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7773 PLUS-OR-MINUS .0326
 T*SQRT(N) = 10.165 T*SQRT(A) = 13.365
 ERROR 1.263 ERROR 1.661

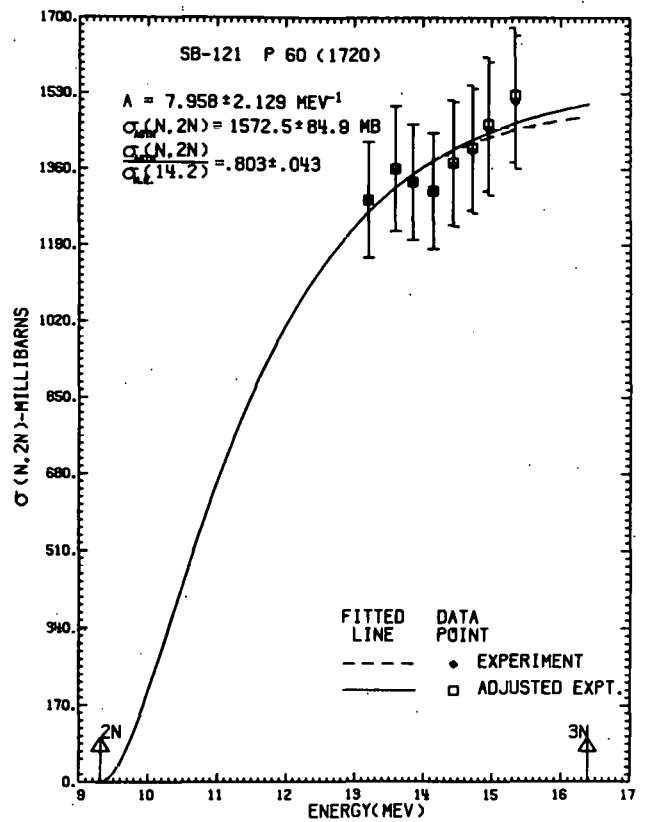


SB-121 ... FROM REF. P 60 (1720)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
13.200	1290.00	130.00	1290.000 130.000
13.599	1360.00	140.00	1360.000 140.000
13.850	1330.00	130.00	1330.000 130.000
14.140	1310.00	130.00	1310.000 130.000
14.430	1370.00	140.00	1373.169 140.324
14.710	1400.00	140.00	1407.011 140.701
14.950	1450.00	150.00	1460.462 151.082
15.340	1510.00	150.00	1526.022 151.592

FITTED PARAMETERS
 LEVEL SPACING = 7.958 PLUS-OR-MINUS 2.129 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1572.54 PLUS-OR-MINUS 84.87 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1958.45 MB
 (N,2N) THRESHOLD = 9.32 MEV
 (N,3N) THRESHOLD = 16.38 MEV
 THIS ISOTOPE HAS 70 NEUTRONS, 51 PROTONS, (MASS = 121)
 NEUTRON EXCESS PARAMETER = .15702
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8030 PLUS-OR-MINUS .0433
 N/SPACING = 8.796 A/SPACING = 15.205
 ERROR 2.353 ERROR 4.068



SB-123 ... FROM REF. B 68 (2891)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.780	1113.00 122.00	1113.000 122.000	
13.440	1247.00 132.00	1247.000 132.000	
14.110	1263.00 135.00	1263.000 135.000	
14.870	1277.00 137.00	1285.123 137.871	
15.520	1358.00 149.00	1374.094 150.766	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.220 PLUS-OR-MINUS .103 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1387.24 PLUS-OR-MINUS 40.71 MB

RELATED DATA

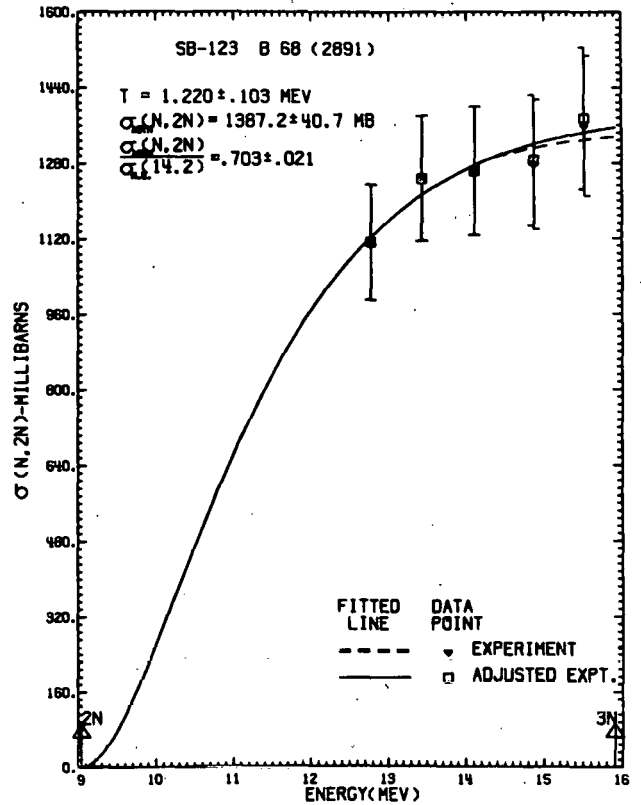
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1973.31 MB
 (N,2N) THRESHOLD = 9.04 MEV
 (N,3N) THRESHOLD = 15.93 MEV

THIS ISOTOPE HAS 72 NEUTRONS, 51 PROTONS, (MASS = 123)

NEUTRON EXCESS PARAMETER = .17073

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7030 PLUS-OR-MINUS .0206

T*SQRT(N) = 10.352 T*SQRT(A) = 13.530
 ERROR .874 ERROR 1.142



SB-123 ... FROM REF. B 68 (2891)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.780	1113.00 122.00	1113.000 122.000	
13.440	1247.00 132.00	1247.000 132.000	
14.110	1263.00 135.00	1263.000 135.000	
14.870	1277.00 137.00	1285.123 137.871	
15.520	1358.00 149.00	1374.094 150.766	

FITTED PARAMETERS

LEVEL SPACING = 7.783 PLUS-OR-MINUS 1.469 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1429.38 PLUS-OR-MINUS 54.78 MB

RELATED DATA

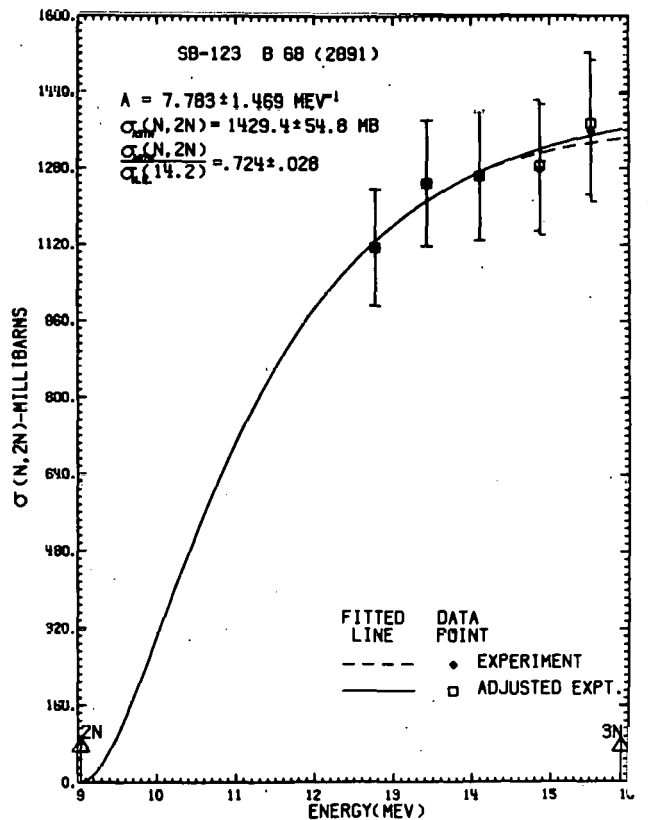
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1973.31 MB
 (N,2N) THRESHOLD = 9.04 MEV
 (N,3N) THRESHOLD = 15.93 MEV

THIS ISOTOPE HAS 72 NEUTRONS, 51 PROTONS, (MASS = 123)

NEUTRON EXCESS PARAMETER = .17073

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7244 PLUS-OR-MINUS .0278

N/SPACING = 9.251 A/SPACING = 15.804
 ERROR 1.746 ERROR 2.983

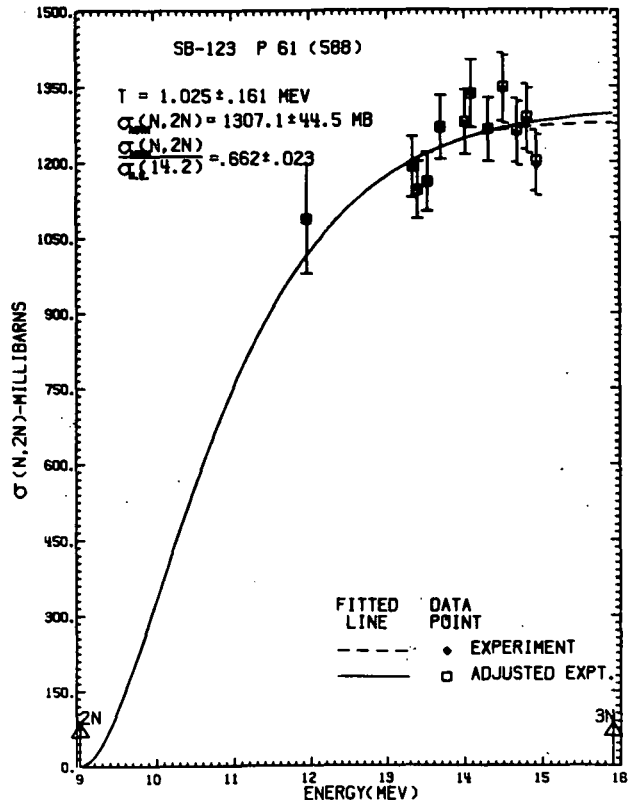


SB-123 ...FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
11.970	1089.00 109.00	1089.0000	109.0000
13.330	1191.00 60.00	1191.0000	60.0000
13.400	1145.00 57.00	1145.0000	57.0000
13.520	1161.00 58.00	1161.0000	58.0000
13.690	1269.00 63.00	1269.0000	63.0000
14.010	1279.00 64.00	1279.0000	64.0000
14.090	1335.00 67.00	1335.0000	67.0000
14.310	1263.00 63.00	1264.384	63.069
14.500	1343.00 67.00	1346.949	67.197
14.680	1256.00 63.00	1261.818	63.292
14.810	1281.00 64.00	1288.457	64.373
14.930	1194.00 60.00	1202.232	60.414

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.025 PLUS-OR-MINUS .161 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1307.07 PLUS-OR-MINUS 44.50 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1973.31 MB
 (N,2N) THRESHOLD = 9.04 MEV
 (N,3N) THRESHOLD = 15.90 MEV
 THIS ISOTOPE HAS 72 NEUTRONS, 51 PROTONS, (MASS = 123)
 NEUTRON EXCESS PARAMETER = .17073
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6624 PLUS-OR-MINUS .0226
 T*SQRT(N) = 8.697 T*SQRT(A) = 11.368
 ERROR 1.366 ERROR 1.786

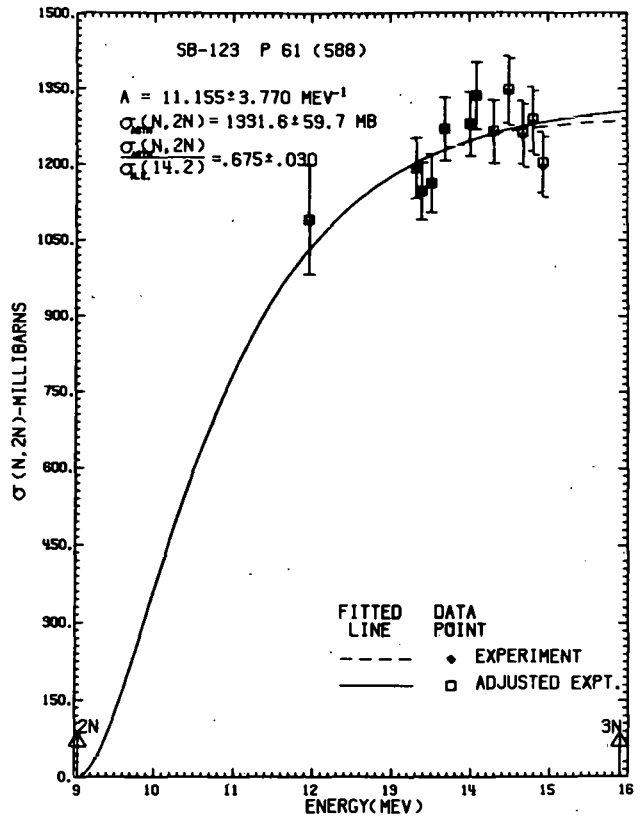


SB-123 ...FROM REF. P 61 (588)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
11.970	1089.00 109.00	1089.0000	109.0000
13.330	1191.00 60.00	1191.0000	60.0000
13.400	1145.00 57.00	1145.0000	57.0000
13.520	1161.00 58.00	1161.0000	58.0000
13.690	1269.00 63.00	1269.0000	63.0000
14.010	1279.00 64.00	1279.0000	64.0000
14.090	1335.00 67.00	1335.0000	67.0000
14.310	1263.00 63.00	1264.384	63.069
14.500	1343.00 67.00	1346.949	67.197
14.680	1256.00 63.00	1261.818	63.292
14.810	1281.00 64.00	1288.457	64.373
14.930	1194.00 60.00	1202.232	60.414

FITTED PARAMETERS
 LEVEL SPACING = 11.155 PLUS-OR-MINUS 3.770 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1331.61 PLUS-OR-MINUS 59.66 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 1973.31 MB
 (N,2N) THRESHOLD = 9.04 MEV
 (N,3N) THRESHOLD = 15.90 MEV
 THIS ISOTOPE HAS 72 NEUTRONS, 51 PROTONS, (MASS = 123)
 NEUTRON EXCESS PARAMETER = .17073
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6748 PLUS-OR-MINUS .0302
 N/SPACING = 6.455 A/SPACING = 11.026
 ERROR 2.181 ERROR 3.727



TE-128 ...FROM REF. B 70

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.600	1450.00 160.00	1490.000 160.000	
13.000	1600.00 160.00	1600.000 160.000	
13.500	1700.00 180.00	1700.000 180.000	
14.300	1780.00 180.00	1781.691 180.171	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.462 PLUS-OR-MINUS .122 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2030.28 PLUS-OR-MINUS 93.48 MB

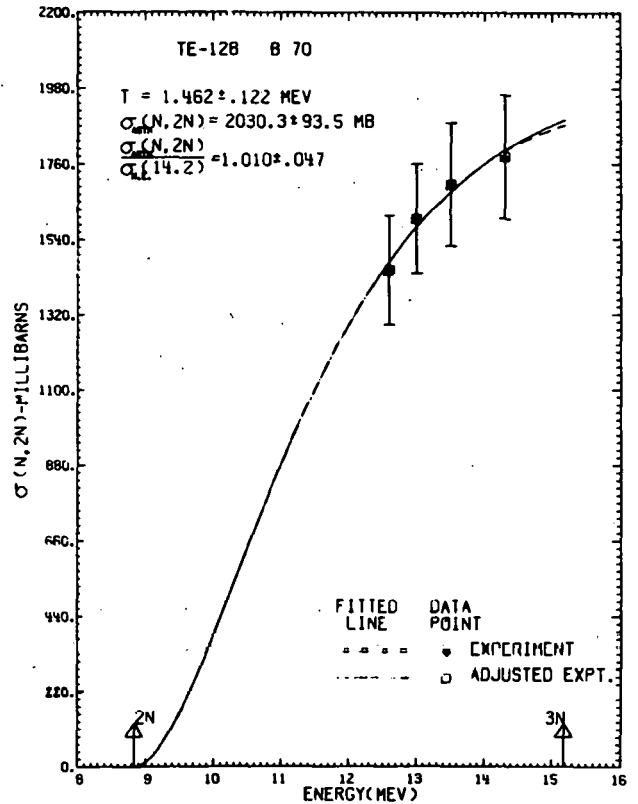
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2010.00 MB
 (N,2N) THRESHOLD = 8.84 MEV
 (N,3N) THRESHOLD = 15.18 MEV

THIS ISOTOPE HAS 76 NEUTRONS, 52 PROTONS, (MASS = 128)
 NEUTRON EXCESS PARAMETER = .18750

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.0101 PLUS-OR-MINUS .0465

T*SQRT(N) = 12.745 T*SQRT(A) = 16.541
 ERROR 1.064 ERROR 1.380



TE-128 ...FROM REF. B 70

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.600	1450.00 160.00	1490.000 160.000	
13.000	1600.00 160.00	1600.000 160.000	
13.500	1700.00 180.00	1700.000 180.000	
14.300	1780.00 180.00	1781.691 180.171	

FITTED PARAMETERS

LEVEL SPACING = 4.903 PLUS-OR-MINUS 1.052 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2175.71 PLUS-OR-MINUS 152.41 MB

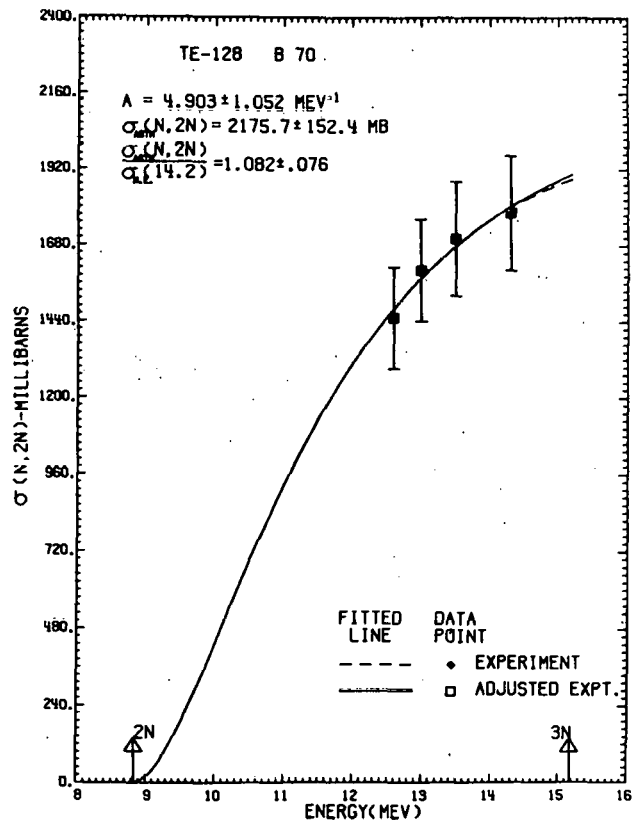
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2010.00 MB
 (N,2N) THRESHOLD = 8.84 MEV
 (N,3N) THRESHOLD = 15.18 MEV

THIS ISOTOPE HAS 76 NEUTRONS, 52 PROTONS, (MASS = 128)
 NEUTRON EXCESS PARAMETER = .18750

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.0824 PLUS-OR-MINUS .0758

N/SPACING = 15.501 A/SPACING = 26.106
 ERROR 3.326 ERROR 5.601

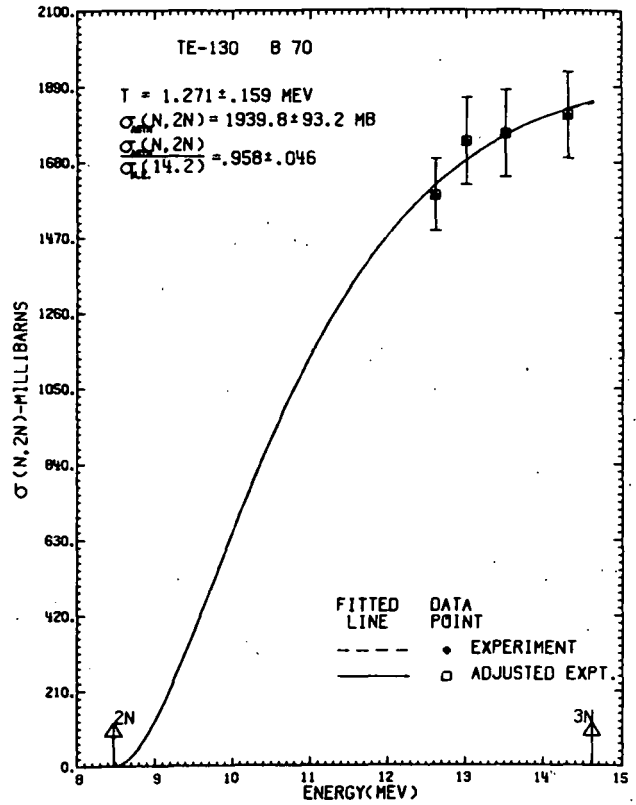


TE-130 ...FROM REF. B 70

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.600	1590.00 100.00	1590.000 100.000	
13.000	1740.00 120.00	1740.000 120.000	
13.500	1760.00 120.00	1760.000 120.000	
14.300	1810.00 120.00	1811.686 120.112	

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.271 PLUS-OR-MINUS .159 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1939.80 PLUS-OR-MINUS 93.25 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2024.51 MB
 (N,2N) THRESHOLD = 8.48 MEV
 (N,3N) THRESHOLD = 14.61 MEV
 THIS ISOTOPE HAS 78 NEUTRONS, 52 PROTONS, (MASS = 130)
 NEUTRON EXCESS PARAMETER = .20000
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .9582 PLUS-OR-MINUS .0461
 T*SORT(N) = 11.225 T*SORT(A) = 14.492
 ERROR 1.404 ERROR 1.613

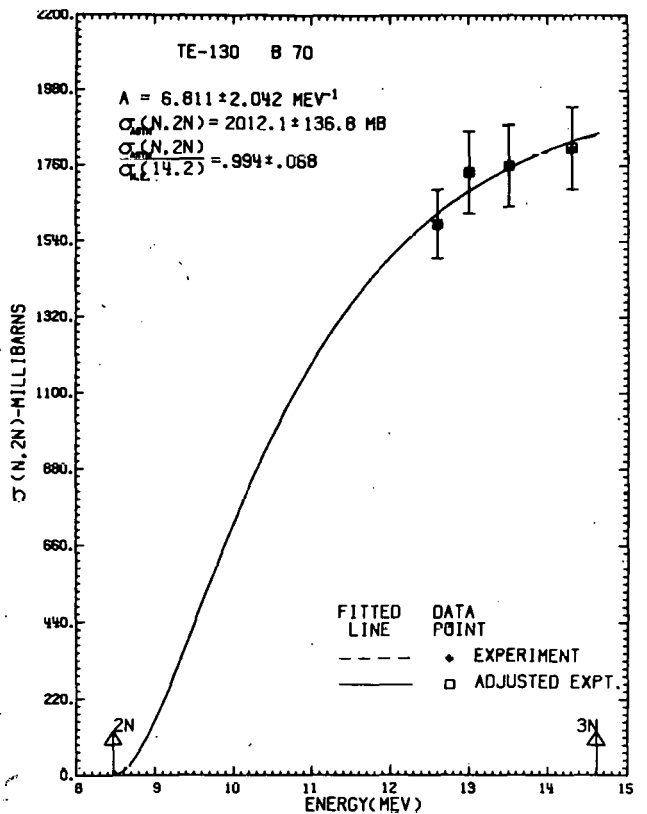


TE-130 ...FROM REF. B 70

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.600	1590.00 100.00	1590.000 100.000	
13.000	1740.00 120.00	1740.000 120.000	
13.500	1760.00 120.00	1760.000 120.000	
14.300	1810.00 120.00	1811.686 120.112	

FITTED PARAMETERS
 LEVEL SPACING = 6.811 PLUS-OR-MINUS 2.042 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2012.14 PLUS-OR-MINUS 136.76 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2024.51 MB
 (N,2N) THRESHOLD = 8.48 MEV
 (N,3N) THRESHOLD = 14.61 MEV
 THIS ISOTOPE HAS 78 NEUTRONS, 52 PROTONS, (MASS = 130)
 NEUTRON EXCESS PARAMETER = .20000
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .9939 PLUS-OR-MINUS .0676
 N/SPACING = 11.452 A/SPACING = 19.067
 ERROR 3.473 ERROR 5.722

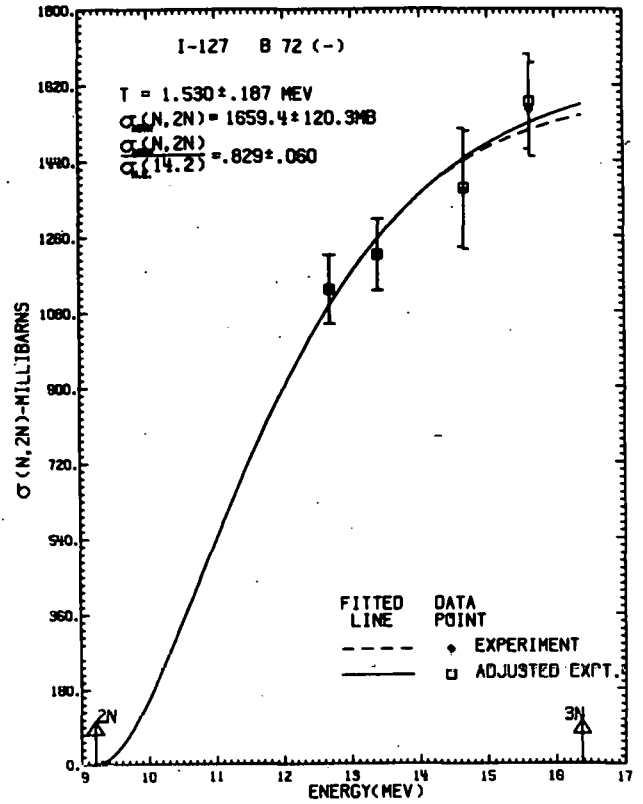


I-127 ... FROM REF. B 72 (-)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.680	1134.00 82.00	1134.000 82.000	
13.380	1216.00 85.00	1216.000 85.000	
14.650	1368.00 140.00	1373.724 140.986	
15.620	1560.00 112.00	1576.910 113.358	

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.530 PLUS-OR-MINUS .187 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1659.4 PLUS-OR-MINUS 120.34 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2002.72 MB
 (N,2N) THRESHOLD = 9.21 MEV
 (N,3N) THRESHOLD = 16.37 MEV
 THIS ISOTOPE HAS 74 NEUTRONS, 53 PROTONS, (MASS = 127)
 NEUTRON EXCESS PARAMETER = .16535
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .8286 PLUS-OR-MINUS .0601
 T=SOFT(N) = 13.162 ERROR 1.609 T=SOFT(A) = 17.242 ERROR 2.107

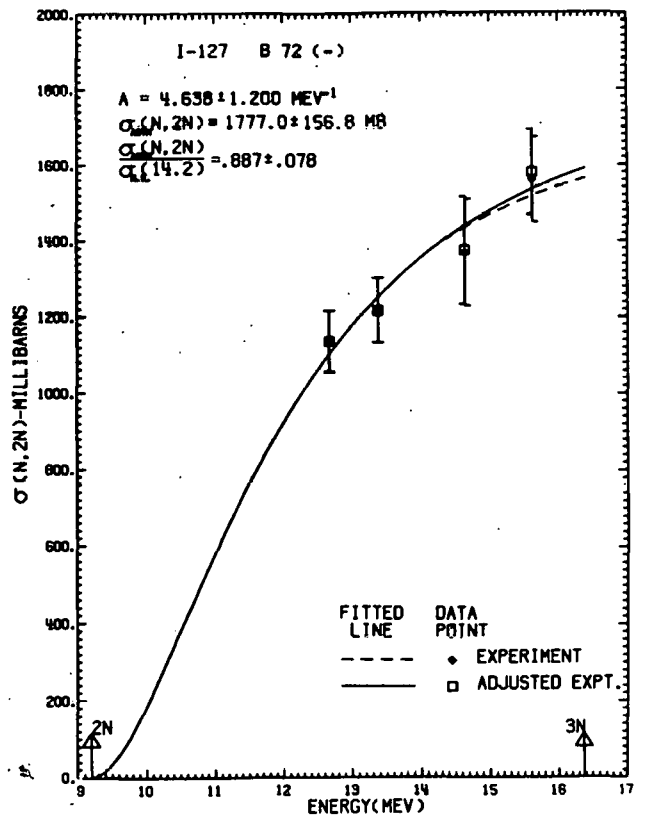


I-127 ... FROM REF. B 72 (-)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.680	1134.00 82.00	1134.000 82.000	
13.380	1216.00 85.00	1216.000 85.000	
14.650	1368.00 140.00	1373.724 140.986	
15.620	1560.00 112.00	1576.910 113.358	

FITTED PARAMETERS
 LEVEL SPACING = 4.638 PLUS-OR-MINUS 1.200 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1776.98 PLUS-OR-MINUS 156.77 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2002.72 MB
 (N,2N) THRESHOLD = 9.21 MEV
 (N,3N) THRESHOLD = 16.37 MEV
 THIS ISOTOPE HAS 74 NEUTRONS, 53 PROTONS, (MASS = 127)
 NEUTRON EXCESS PARAMETER = .16535
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .8873 PLUS-OR-MINUS .0783
 N/SPACING = 15.955 ERROR 4.128 A/SPACING = 27.382 ERROR 7.085



I-127 ... FROM REF. B 62 (562)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ERR	ADJUSTED	ERR
13.160	1190.00	70.00	1190.000	70.000	
14.100	1300.00	70.00	1300.000	70.000	
15.210	1300.00	70.00	1311.620	70.626	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.065 PLUS-OR-MINUS .118 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1355.87 PLUS-OR-MINUS 38.48 MB

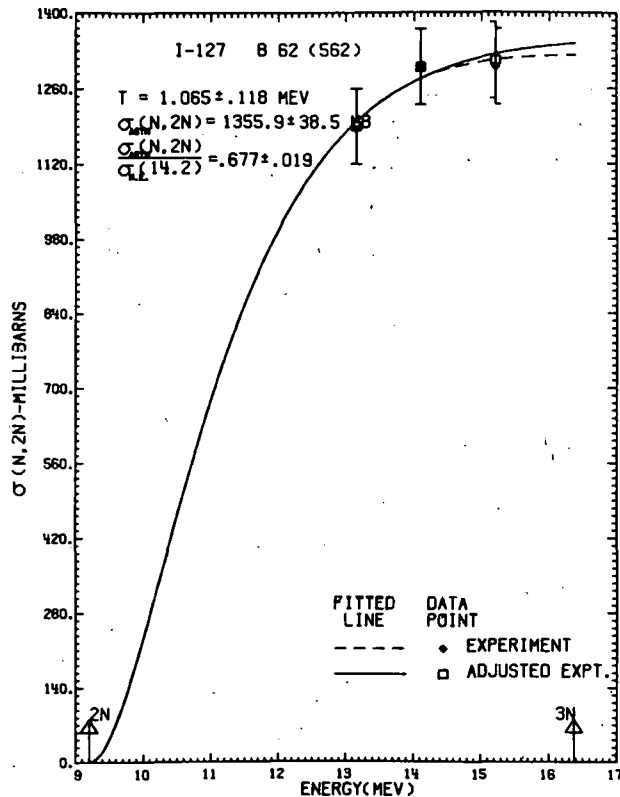
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2002.72 MB
 (N,2N) THRESHOLD = 9.21 MEV
 (N,3N) THRESHOLD = 16.37 MEV

THIS ISOTOPE HAS 74 NEUTRONS, 53 PROTONS, (MASS = 127)
 NEUTRON EXCESS PARAMETER = .16935

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6770 PLUS-OR-MINUS .0192

T*SQRT(N) = 9.161 T*SQRT(A) = 12.002
 ERROR 1.015 ERROR 1.330



I-127 ... FROM REF. B 62 (562)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ERR	ADJUSTED	ERR
13.160	1190.00	70.00	1190.000	70.000	
14.100	1300.00	70.00	1300.000	70.000	
15.210	1300.00	70.00	1311.620	70.626	

FITTED PARAMETERS

LEVEL SPACING = 10.736 PLUS-OR-MINUS 2.887 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1378.46 PLUS-OR-MINUS 54.82 MB

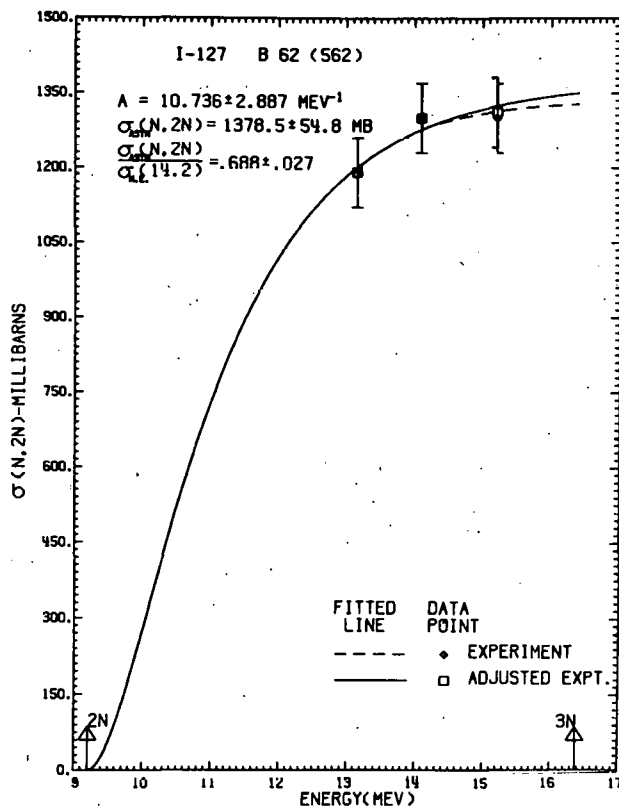
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2002.72 MB
 (N,2N) THRESHOLD = 9.21 MEV
 (N,3N) THRESHOLD = 16.37 MEV

THIS ISOTOPE HAS 74 NEUTRONS, 53 PROTONS, (MASS = 127)
 NEUTRON EXCESS PARAMETER = .16535

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6803 PLUS-OR-MINUS .0274

N/SPACING = 6.893 A/SPACING = 11.829
 ERROR 1.854 ERROR 3.181



I-127 ... FROM REF, M 53 (91)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.300	900.00	50.00	900.000	50.000	
13.100	1120.00	70.00	1120.000	70.000	
14.100	1300.00	80.00	1300.000	80.000	
15.600	1320.00	.00	1335.803	1.000	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.383 PLUS-OR-MINUS .084 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1414.13 PLUS-OR-MINUS 19.22 MB

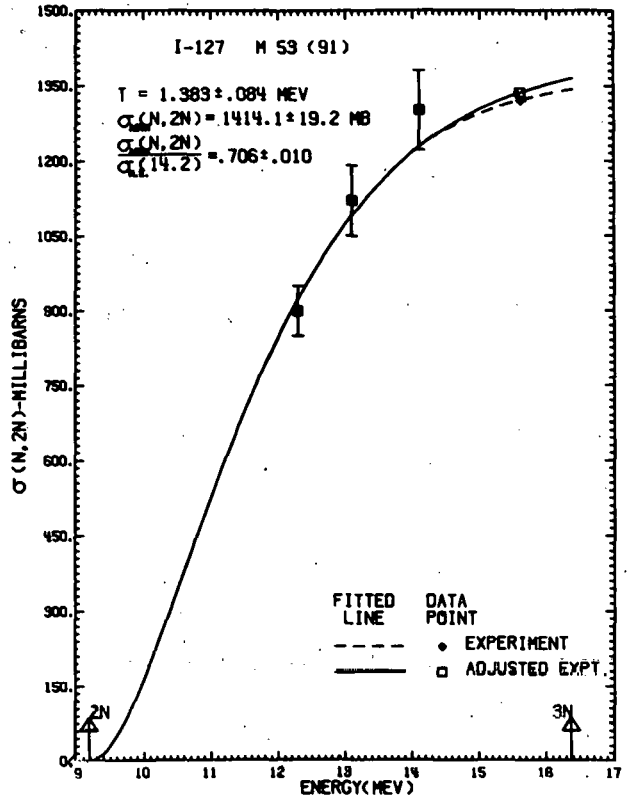
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2002.72 MB
 (N,2N) THRESHOLD = 9.21 MEV
 (N,3N) THRESHOLD = 16.37 MEV

THIS ISOTOPE HAS 74 NEUTRONS, 53 PROTONS, (MASS = 127)
 NEUTRON EXCESS PARAMETER = .16535

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7061 PLUS-OR-MINUS .0096

T=SQRT(N) = 11.897 T=SQRT(A) = 15.586
 ERROR .723 ERROR .947



I-127 ... FROM REF, M 53 (91)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.300	900.00	50.00	900.000	50.000	
13.100	1120.00	70.00	1120.000	70.000	
14.100	1300.00	80.00	1300.000	80.000	
15.600	1320.00	.00	1335.803	1.000	

FITTED PARAMETERS

LEVEL SPACING = 5.811 PLUS-OR-MINUS .937 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1482.91 PLUS-OR-MINUS 40.92 MB

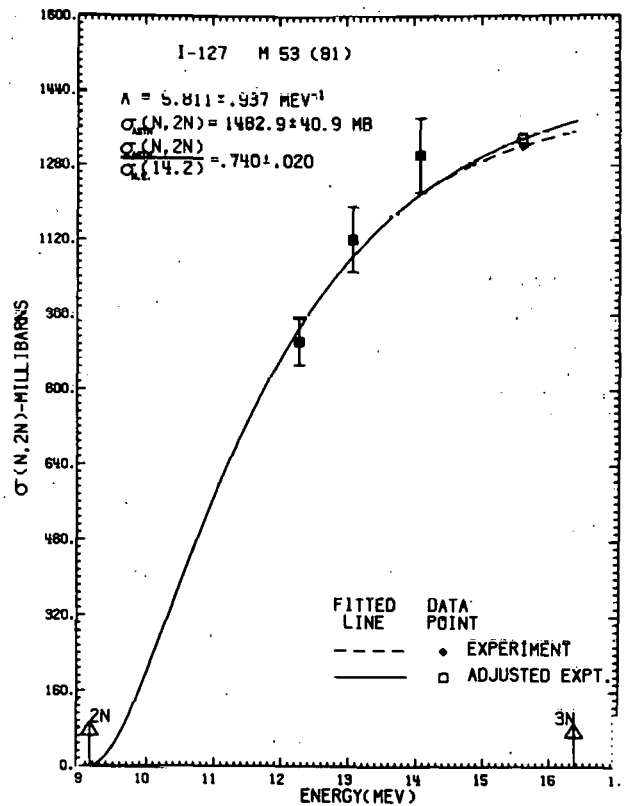
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2002.72 MB
 (N,2N) THRESHOLD = 9.21 MEV
 (N,3N) THRESHOLD = 16.37 MEV

THIS ISOTOPE HAS 74 NEUTRONS, 53 PROTONS, (MASS = 127)
 NEUTRON EXCESS PARAMETER = .16535

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7405 PLUS-OR-MINUS .0204

N/SPACING = 12.734 A/SPACING = 21.855
 ERROR 2.053 ERROR 3.524



CS-133 ... FROM REF. B 72

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.680	1038.00	73.00	1038.000	73.000	
13.380	1157.00	77.00	1157.000	77.000	
14.650	1359.00	99.00	1364.356	99.390	
15.620	1449.00	102.00	1465.486	103.160	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.687 PLUS-OR-MINUS .065 MEV

ASYMPTOTIC (N,2N) CROSS SECTION = 1618.33 PLUS-OR-MINUS 39.34 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2046.10 MB

(N,2N) THRESHOLD = 9.05 MEV

(N,3N) THRESHOLD = 16.29 MEV

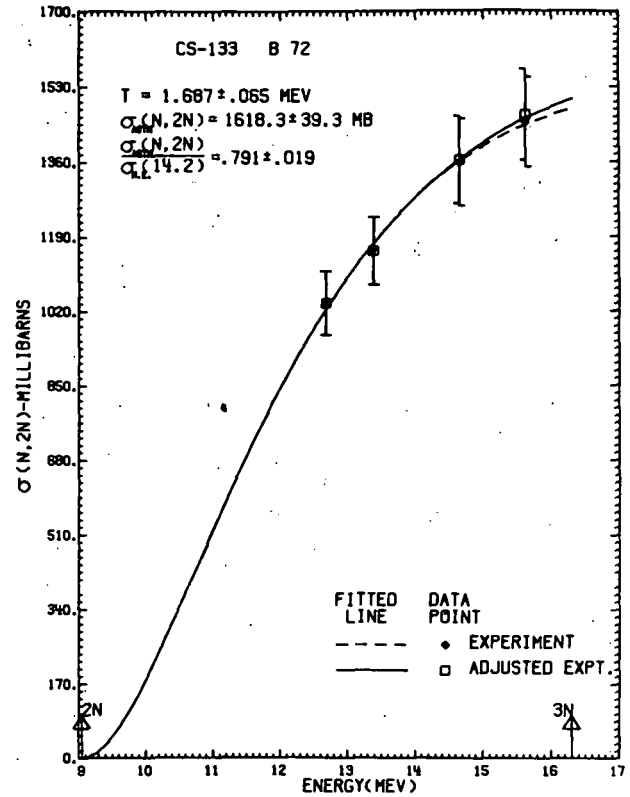
THIS ISOTOPE HAS 78 NEUTRONS, 55 PROTONS, (MASS = 133)

NEUTRON EXCESS PARAMETER = .17293

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .7909 PLUS-OR-MINUS .0192

T*SORT(N) = 14.899 T*SORT(A) = 19.495

ERROR .574 ERROR .750



CS-133 ... FROM REF. B 72

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.680	1038.00	73.00	1038.000	73.000	
13.380	1157.00	77.00	1157.000	77.000	
14.650	1359.00	99.00	1364.356	99.390	
15.620	1449.00	102.00	1465.486	103.160	

FITTED PARAMETERS

LEVEL SPACING = 3.688 PLUS-OR-MINUS .254 PER MEV

ASYMPTOTIC (N,2N) CROSS SECTION = 1766.10 PLUS-OR-MINUS 44.83 MB

RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2046.10 MB

(N,2N) THRESHOLD = 9.05 MEV

(N,3N) THRESHOLD = 16.29 MEV

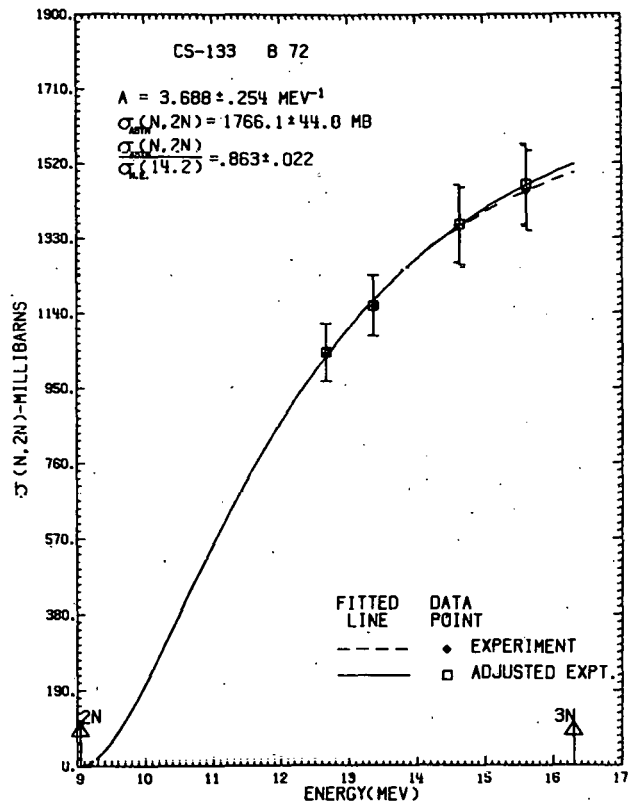
THIS ISOTOPE HAS 78 NEUTRONS, 55 PROTONS, (MASS = 133)

NEUTRON EXCESS PARAMETER = .17293

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .8632 PLUS-OR-MINUS .0219

N/SPACING = 21.150 A/SPACING = 36.063

CHDR 1.497 ENROR 2.484



CS-133 ...FROM REF. 862(562)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.160	1180.00	100.00	1180.000	100.000	
14.100	1300.00	100.00	1300.000	100.000	
16.030	1130.00	100.00	1145.960	101.412	

FITTED PARAMETERS

NUCLEAR TEMP. = .654 PLUS-OR-MINUS 3.530 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1214.02 PLUS-OR-MINUS 94.82 MB

RELATED DATA

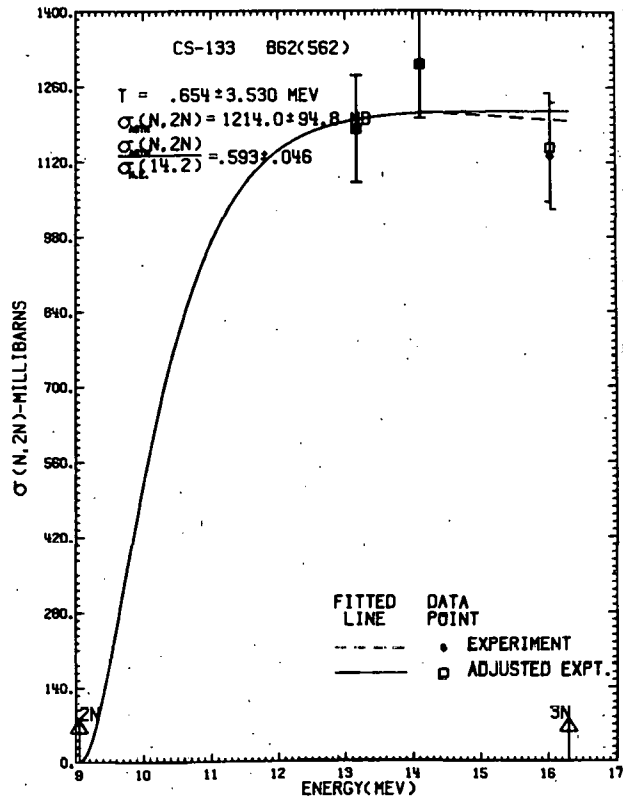
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2046.10 MB
 (N,2N) THRESHOLD = 9.05 MEV
 (N,3N) THRESHOLD = 16.29 MEV

THIS ISOTOPE HAS 78 NEUTRONS, 55 PROTONS, (MASS = 133)

NEUTRON EXCESS PARAMETER = .17293

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5933 PLUS-OR-MINUS .0463

T*SQRT(N) = 5.776 T*SQRT(A) = 7.542
 ERROR 31.176 ERROR 40.710



CS-133 ...FROM REF. 862(562)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
13.160	1180.00	100.00	1180.000	100.000	
14.100	1300.00	100.00	1300.000	100.000	
16.030	1130.00	100.00	1145.960	101.412	

FITTED PARAMETERS

LEVEL SPACING = 11.064 PLUS-OR-MINUS 542. PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1213.80 PLUS-OR-MINUS 96.17 MB

RELATED DATA

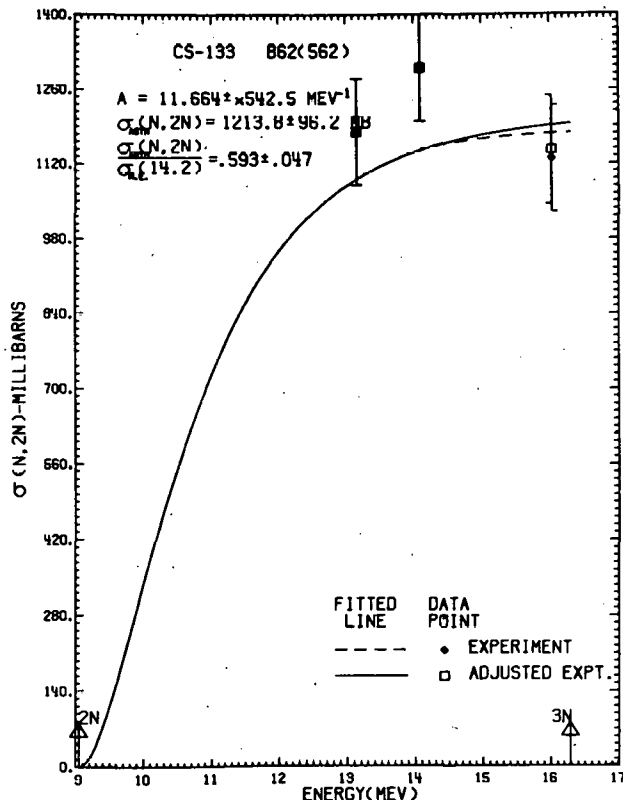
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2046.10 MB
 (N,2N) THRESHOLD = 9.05 MEV
 (N,3N) THRESHOLD = 16.29 MEV

THIS ISOTOPE HAS 78 NEUTRONS, 55 PROTONS, (MASS = 133)

NEUTRON EXCESS PARAMETER = .17293

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .5932 PLUS-OR-MINUS .0470

H/SPACING = 6.687 A/SPACING = 11.403
 ERROR 311.058 ERROR 530.393



CE-140 ...FROM REF. B68(2891)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.940	1587.00	111.00	1587.000 111.000
13.510	1743.00	122.00	1743.000 122.000
14.100	1804.00	105.00	1804.000 105.000
14.880	1823.00	128.00	1832.895 128.695
15.820	1982.00	139.00	2002.924 140.467
16.310	1904.00	133.00	1931.960 134.953

FITTED PARAMETERS

NUCLEAR TEMP. = 1.232 PLUS-OR-MINUS .079 MEV
ASYMPTOTIC (N,2N) CROSS SECTION = 2001.41 PLUS-OR-MINUS 44.54 MB

RELATED DATA

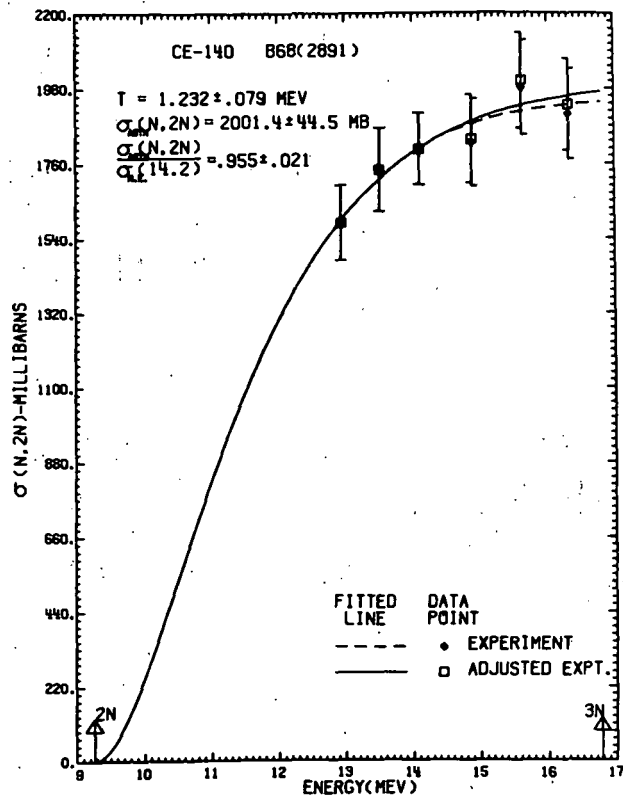
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2095.72 MB
(N,2N) THRESHOLD = 9.27 MEV
(N,3N) THRESHOLD = 16.78 MEV

THIS ISOTOPE HAS 82 NEUTRONS, 58 PROTONS, (MASS = 140)

NEUTRON EXCESS PARAMETER = .17143

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
.9550 PLUS-OR-MINUS .0213

T=SQRT(N) = 11.156 ERROR .715
T=SQRT(A) = 14.577 ERROR .935



CE-140 ...FROM REF. B68(2891)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.940	1587.00	111.00	1587.000 111.000
13.510	1743.00	122.00	1743.000 122.000
14.100	1804.00	105.00	1804.000 105.000
14.880	1823.00	128.00	1832.895 128.695
15.820	1982.00	139.00	2002.924 140.467
16.310	1904.00	133.00	1931.960 134.953

FITTED PARAMETERS

LEVEL SPACING = 7.893 PLUS-OR-MINUS 1.139 PER MEV
ASYMPTOTIC (N,2N) CROSS SECTION = 2055.44 PLUS-OR-MINUS 59.05 MB

RELATED DATA

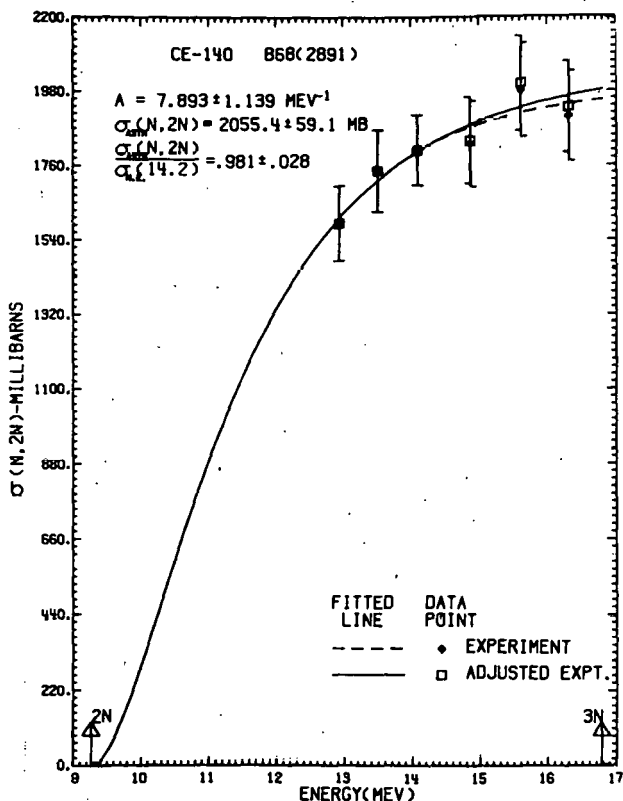
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2095.72 MB
(N,2N) THRESHOLD = 9.27 MEV
(N,3N) THRESHOLD = 16.78 MEV

THIS ISOTOPE HAS 82 NEUTRONS, 58 PROTONS, (MASS = 140)

NEUTRON EXCESS PARAMETER = .17143

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
.9808 PLUS-OR-MINUS .0282

N/SPACING = 10.389 ERROR 1.499
A/SPACING = 17.737 ERROR 2.560



PR-141 ... FROM REF. B 68 (2891)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.780	1496.00	144.00	1496.000	144.000
13.440	1485.00	143.00	1485.000	143.000
14.110	1614.00	159.00	1614.000	159.000
14.870	1700.00	164.00	1709.007	164.869
15.520	1787.00	172.00	1804.517	173.686
16.180	1801.00	174.00	1825.849	176.401
16.850	1872.00	180.00	1904.409	183.116

FITTED PARAMETERS

NUCLEAR TEMP. = 1.228 PLUS-OR-MINUS .106 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1868.44 PLUS-OR-MINUS 58.22 MB

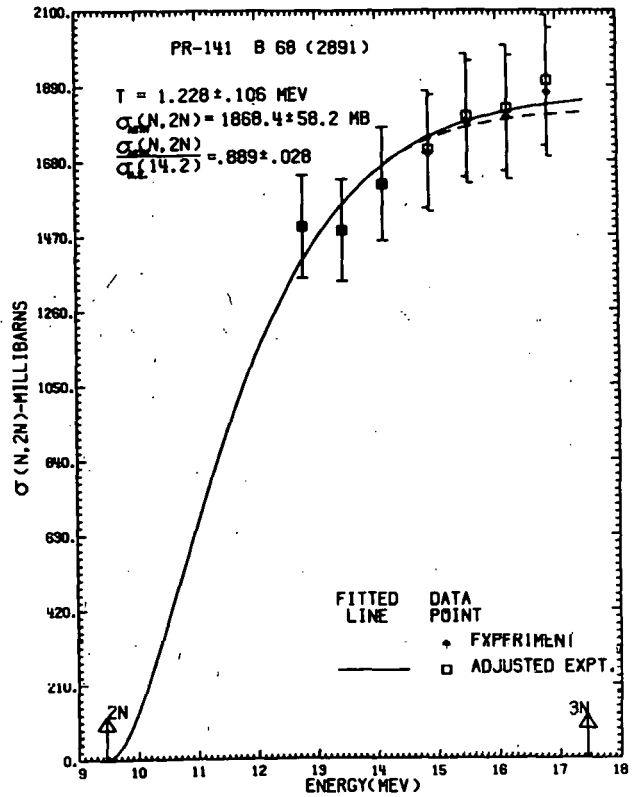
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2102.73 MB
 (N,2N) THRESHOLD = 9.46 MEV
 (N,3N) THRESHOLD = 17.45 MEV

THIS ISOTOPE HAS 82 NEUTRONS, 59 PROTONS, (MASS = 141)
 NEUTRON EXCESS PARAMETER = .16312

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8886 PLUS-OR-MINUS .0277

T*SQRT(N) = 11.120 T*SQRT(A) = 14.582
 ERROR .040 ERROR 1.259



PR-141 ... FROM REF. B 68 (2891)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.780	1496.00	144.00	1496.000	144.000
13.440	1485.00	143.00	1485.000	143.000
14.110	1614.00	159.00	1614.000	159.000
14.870	1700.00	164.00	1709.007	164.869
15.520	1787.00	172.00	1804.517	173.686
16.180	1801.00	174.00	1825.849	176.401
16.850	1872.00	180.00	1904.409	183.116

FITTED PARAMETERS

LEVEL SPACING = 7.894 PLUS-OR-MINUS 1.348 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1922.96 PLUS-OR-MINUS 67.85 MB

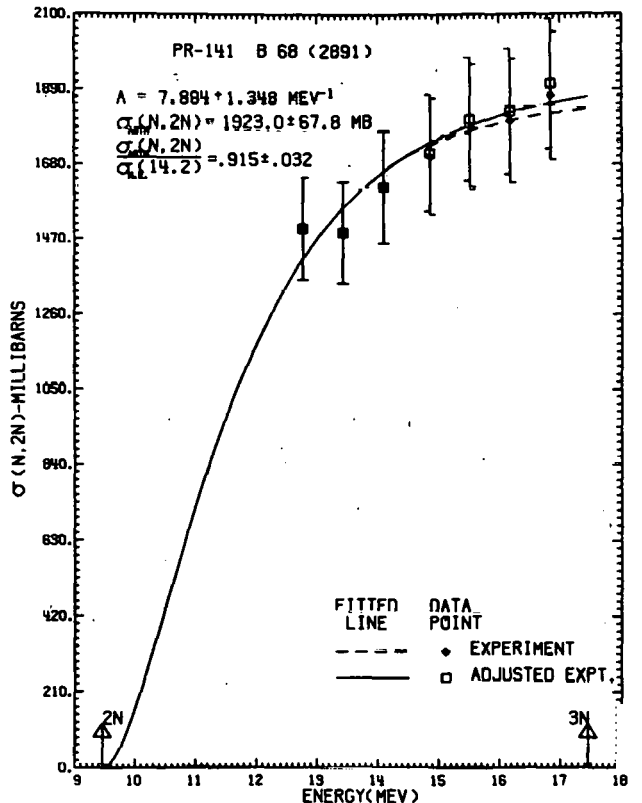
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2102.73 MB
 (N,2N) THRESHOLD = 9.46 MEV
 (N,3N) THRESHOLD = 17.45 MEV

THIS ISOTOPE HAS 82 NEUTRONS, 59 PROTONS, (MASS = 141)
 NEUTRON EXCESS PARAMETER = .16312

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .9145 PLUS-OR-MINUS .0323

N/SPACING = 10.388 A/SPACING = 17.862
 ERROR 1.774 ERROR 3.050



PR-141 ... FROM REF. F 60 (602)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.410	1231.00	111.00	1231.000	111.000
13.770	1386.00	125.00	1386.000	125.000
14.740	1591.00	143.00	1597.880	143.618
15.760	1737.00	156.00	1756.876	157.785
16.960	1606.00	145.00	1634.653	147.587

FITTED PARAMETERS

NUCLEAR TEMP. = 1.199 PLUS-OR-MINUS .139 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1696.76 PLUS-OR-MINUS 78.11 MB

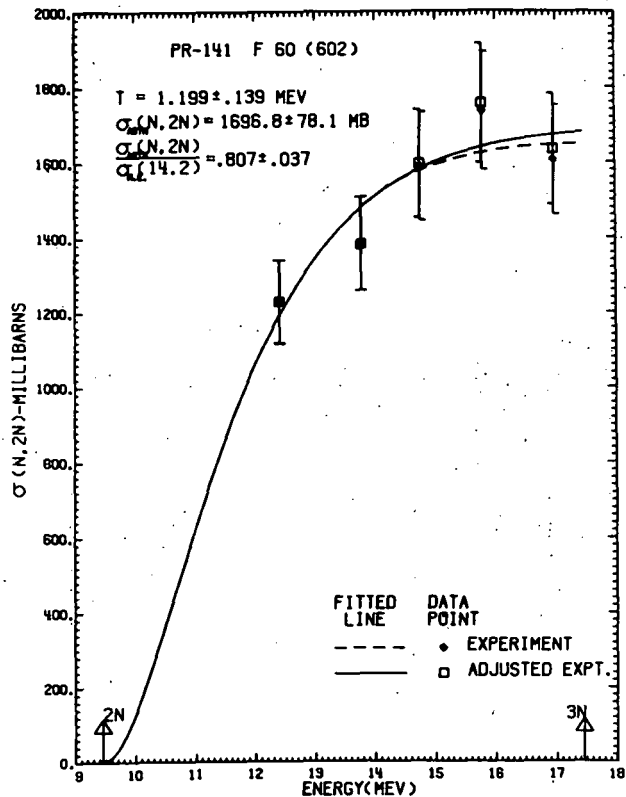
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2102.73 MB
 (N,2N) THRESHOLD = 9.46 MEV
 (N,3N) THRESHOLD = 17.45 MEV

THIS ISOTOPE HAS 82 NEUTRONS, 59 PROTONS, (MASS = 141)
 NEUTRON EXCESS PARAMETER = .16312

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8069 PLUS-OR-MINUS .0371

T*SQRT(N) = 10.897 T*SQRT(A) = 14.237
 ERROR 1.259 ERROR 1.651



PR-141 ... FROM REF. F 60 (602)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.410	1231.00	111.00	1231.000	111.000
13.770	1386.00	125.00	1386.000	125.000
14.740	1591.00	143.00	1597.880	143.618
15.760	1737.00	156.00	1756.876	157.785
16.960	1606.00	145.00	1634.653	147.587

FITTED PARAMETERS

LEVEL SPACING = 8.135 PLUS-OR-MINUS 1.976 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1745.71 PLUS-OR-MINUS 94.30 MB

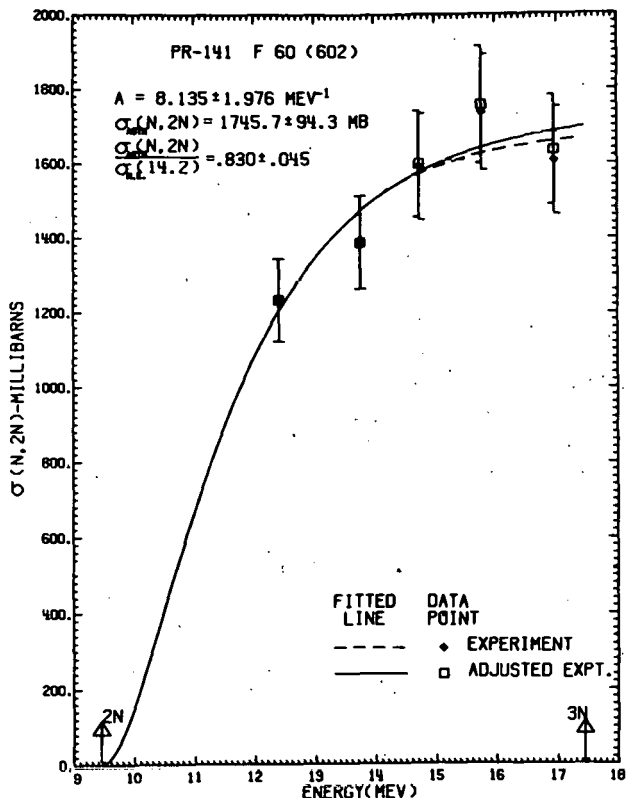
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2102.73 MB
 (N,2N) THRESHOLD = 9.46 MEV
 (N,3N) THRESHOLD = 17.45 MEV

THIS ISOTOPE HAS 82 NEUTRONS, 59 PROTONS, (MASS = 141)
 NEUTRON EXCESS PARAMETER = .16312

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8302 PLUS-OR-MINUS .0448

N/SPACING = 10.080 A/SPACING = 17.333
 ERROR 2.448 ERROR 4.210



PR-141 ... FROM REF. K 60 (770)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.200	1240.00 100.00	1240.000 100.000	1240.000 100.000
12.600	1590.00 150.00	1590.000 150.000	1590.000 150.000
13.800	1690.00 150.00	1690.000 150.000	1690.000 150.000
14.050	1770.00 150.00	1770.000 150.000	1770.000 150.000
14.300	1800.00 170.00	1801.904 170.142	1801.904 170.142
15.950	1780.00 160.00	1802.193 161.995	1802.193 161.995
16.700	1830.00 180.00	1860.323 182.983	1860.323 182.983

FITTED PARAMETERS

NUCLEAR TEMP. = 1.151 PLUS-OR-MINUS .094 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1906.39 PLUS-OR-MINUS 71.28 MB

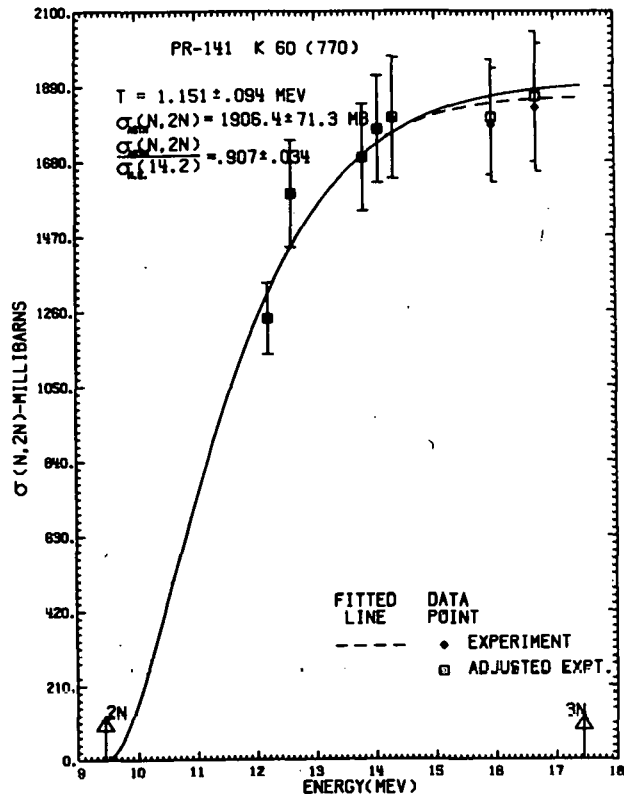
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2102.73 MB
 (N,2N) THRESHOLD = 9.46 MEV
 (N,3N) THRESHOLD = 17.45 MEV

THIS ISOTOPE HAS 82 NEUTRONS, 59 PROTONS, (MASS = 141)
 NEUTRON EXCESS PARAMETER = .16312

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .9066 PLUS-OR-MINUS .0439

T=SQRT(N) = 10.423 T=SQRT(A) = 13.667
 ERROR .851 ERROR 1.116



PR-141 ... FROM REF. K 60 (770)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
12.200	1240.00 100.00	1240.000 100.000	1240.000 100.000
12.600	1590.00 150.00	1590.000 150.000	1590.000 150.000
13.800	1690.00 150.00	1690.000 150.000	1690.000 150.000
14.050	1770.00 150.00	1770.000 150.000	1770.000 150.000
14.300	1800.00 170.00	1801.904 170.142	1801.904 170.142
15.950	1780.00 160.00	1802.193 161.995	1802.193 161.995
16.700	1830.00 180.00	1860.323 182.983	1860.323 182.983

FITTED PARAMETERS

LEVEL SPACING = 8.703 PLUS-OR-MINUS 1.683 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1962.17 PLUS-OR-MINUS 95.13 MB

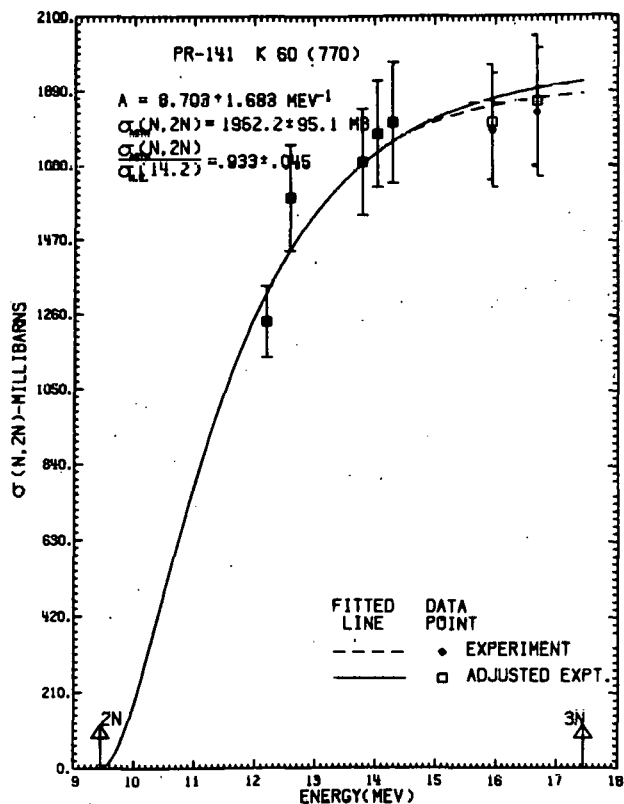
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2102.73 MB
 (N,2N) THRESHOLD = 9.46 MEV
 (N,3N) THRESHOLD = 17.45 MEV

THIS ISOTOPE HAS 82 NEUTRONS, 59 PROTONS, (MASS = 141)
 NEUTRON EXCESS PARAMETER = .16312

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .9332 PLUS-OR-MINUS .0452

N/SPACING = 9.422 A/SPACING = 16.201
 ERROR 1.822 ERROR 3.133



ND-142 ... FROM REF. B 70

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.800	1220.00	120.00	1220.000	120.000
13.300	1360.00	120.00	1360.000	120.000
14.100	1560.00	120.00	1560.000	120.000
14.600	1540.00	120.00	1544.950	120.386
15.100	1610.00	120.00	1621.090	120.827
15.700	1710.00	170.00	1728.518	171.841
16.300	1800.00	170.00	1825.746	172.432
16.900	1760.00	150.00	1790.536	152.603
17.500	1730.00	170.00	1764.611	173.401

FITTED PARAMETERS

NUCLEAR TEMP. = 1.282 PLUS-OR-MINUS .055 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1818.23 PLUS-OR-MINUS 33.00 MB

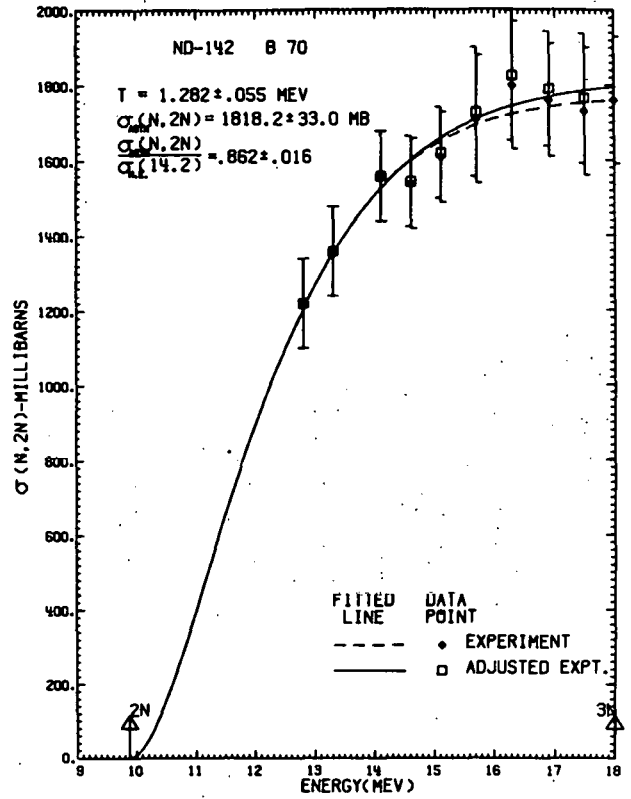
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2109.72 MB
 (N,2N) THRESHOLD = 9.88 MEV
 (N,3N) THRESHOLD = 10.00 MEV

THIS ISOTOPE HAS 82 NEUTRONS, 60 PROTONS, (MASS = 142)
 NEUTRON EXCESS PARAMETER = .15493

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8618 PLUS-OR-MINUS .0156

T*SORT(N) = 11.609 ERROR .498
 T*SORT(A) = 15.277 ERROR .655



ND-142 ... FROM REF. B 70

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.800	1220.00	120.00	1220.000	120.000
13.300	1360.00	120.00	1360.000	120.000
14.100	1560.00	120.00	1560.000	120.000
14.600	1540.00	120.00	1544.950	120.386
15.100	1610.00	120.00	1621.090	120.827
15.700	1710.00	170.00	1728.518	171.841
16.300	1800.00	170.00	1825.746	172.432
16.900	1760.00	150.00	1790.536	152.603
17.500	1730.00	170.00	1764.611	173.401

FITTED PARAMETERS

LEVEL SPACING = 7.339 PLUS-OR-MINUS .655 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1882.30 PLUS-OR-MINUS 40.43 MB

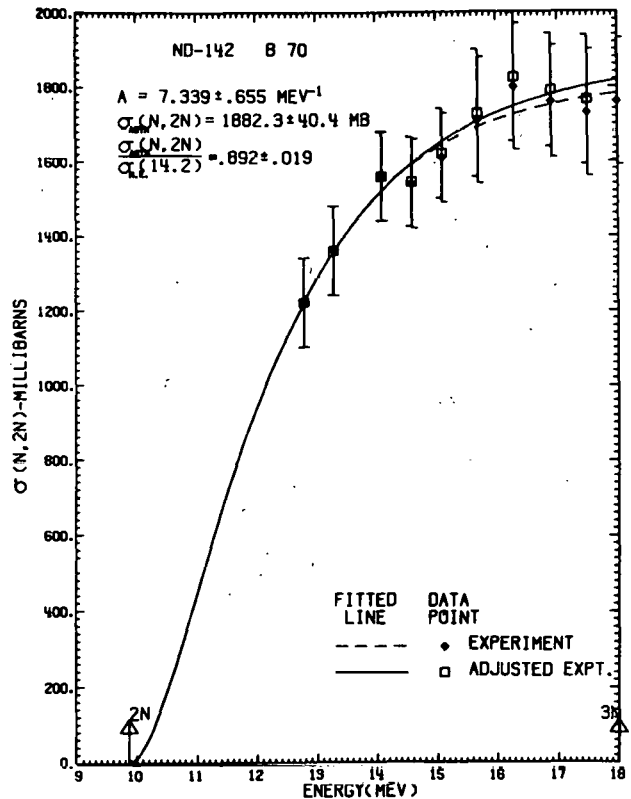
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2109.72 MB
 (N,2N) THRESHOLD = 9.88 MEV
 (N,3N) THRESHOLD = 10.00 MEV

THIS ISOTOPE HAS 82 NEUTRONS, 60 PROTONS, (MASS = 142)
 NEUTRON EXCESS PARAMETER = .15493

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8922 PLUS-OR-MINUS .0192

N/SPACING = 11.173 ERROR .997
 A/SPACING = 19.349 ERROR 1.727



SM-144 ...FROM REF. B 68 (2891)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.780	890.00	88.00	890.000	88.000	
13.440	1081.00	106.00	1081.000	106.000	
14.110	1371.00	137.00	1371.000	137.000	
14.870	1629.00	160.00	1637.368	160.822	
15.520	1637.00	160.00	1652.937	161.519	
16.180	1703.00	168.00	1729.718	170.241	
16.850	1703.00	168.00	1731.465	170.808	
17.780	1856.00	181.00	1894.236	184.729	
18.560	1706.00	166.00	1745.622	169.855	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.370 PLUS-OR-MINUS .061 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1878.00 PLUS-OR-MINUS 49.07 MB

RELATED DATA

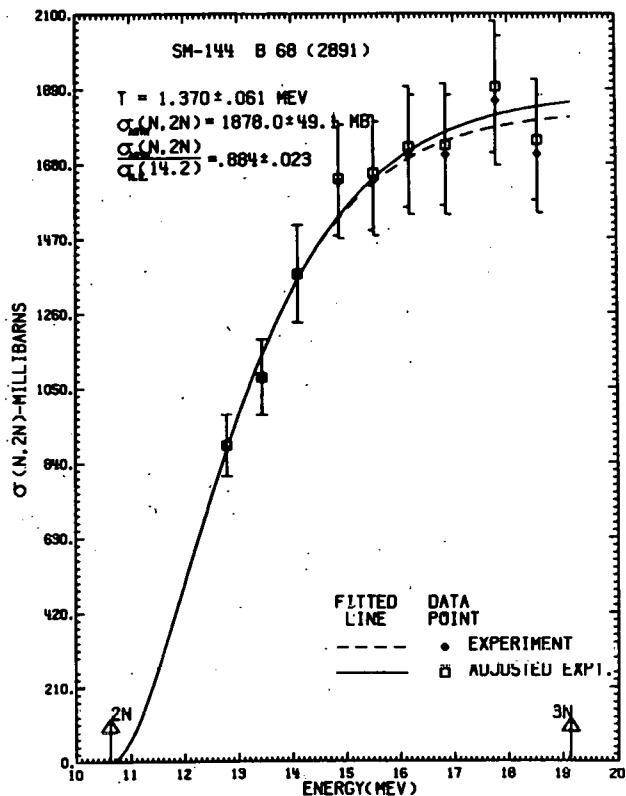
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2123.64 MB
 (N,2N) THRESHOLD = 10.62 MEV
 (N,3N) THRESHOLD = 19.13 MEV

THIS ISOTOPE HAS 82 NEUTRONS, 62 PROTONS, (MASS = 144)

NEUTRON EXCESS PARAMETER = .13889

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .8843 PLUS-OR-MINUS .0231

T=SQRT(N) = 12.406 T=SQRT(A) = 16.440
 ERROR .682 ERROR .732



SM-144 ...FROM REF. B 68 (2891)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
12.780	890.00	88.00	890.000	88.000	
13.440	1081.00	106.00	1081.000	106.000	
14.110	1371.00	137.00	1371.000	137.000	
14.870	1629.00	160.00	1637.368	160.822	
15.520	1637.00	160.00	1652.937	161.519	
16.180	1703.00	168.00	1729.718	170.241	
16.850	1703.00	168.00	1731.465	170.808	
17.780	1856.00	181.00	1894.236	184.729	
18.560	1706.00	166.00	1745.622	169.855	

FITTED PARAMETERS

LEVEL SPACING = 6.462 PLUS-OR-MINUS .706 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1988.30 PLUS-OR-MINUS 69.61 MB

RELATED DATA

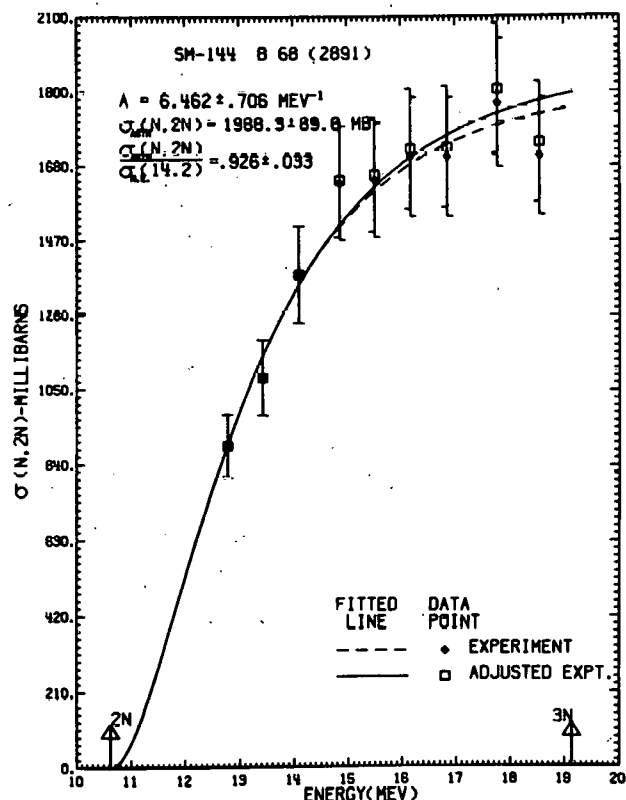
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2123.64 MB
 (N,2N) THRESHOLD = 10.62 MEV
 (N,3N) THRESHOLD = 19.13 MEV

THIS ISOTOPE HAS 82 NEUTRONS, 62 PROTONS, (MASS = 144)

NEUTRON EXCESS PARAMETER = .13889

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .9259 PLUS-OR-MINUS .0328

N/SPACING = 12.690 A/SPACING = 22.284
 ERROR 1.386 ERROR 2.435

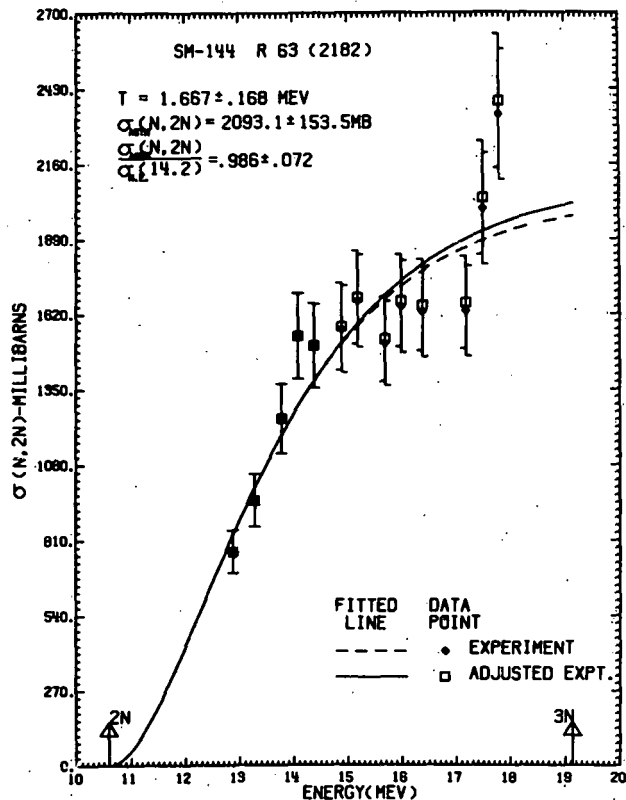


SM-144 ... FROM REF. R 63 (2182)

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
12.900	769.00 77.00	769.000 77.000
13.300	953.00 95.00	953.000 95.000
13.800	1247.00 125.00	1247.000 125.000
14.100	1544.00 154.00	1544.000 154.000
14.400	1508.00 151.00	1510.422 151.243
14.900	1569.00 157.00	1577.395 157.840
15.200	1670.00 167.00	1682.393 168.239
15.700	1516.00 152.00	1532.063 153.611
16.000	1650.00 165.00	1670.368 167.037
16.400	1631.00 163.00	1654.657 165.364
17.200	1634.00 163.00	1663.870 165.980
17.500	2000.00 200.00	2039.045 203.904
17.800	2336.00 234.00	2384.298 238.838

FITTED PARAMETERS
 NUCLEAR TEMP. = 1.667 PLUS-OR-MINUS .168 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2093.13 PLUS-OR-MINUS 153.55 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2123.64 MB
 (N,2N) THRESHOLD = 10.62 MEV
 (N,3N) THRESHOLD = 19.13 MEV
 THIS ISOTOPE HAS 82 NEUTRONS, 62 PROTONS, (MASS = 144)
 NEUTRON EXCESS PARAMETER = .13889
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .9856 PLUS-OR-MINUS .0723
 T=SQRT(N) = 15.095 T=SQRT(A) = 20.004
 ERROR 1.521 ERROR 2.016

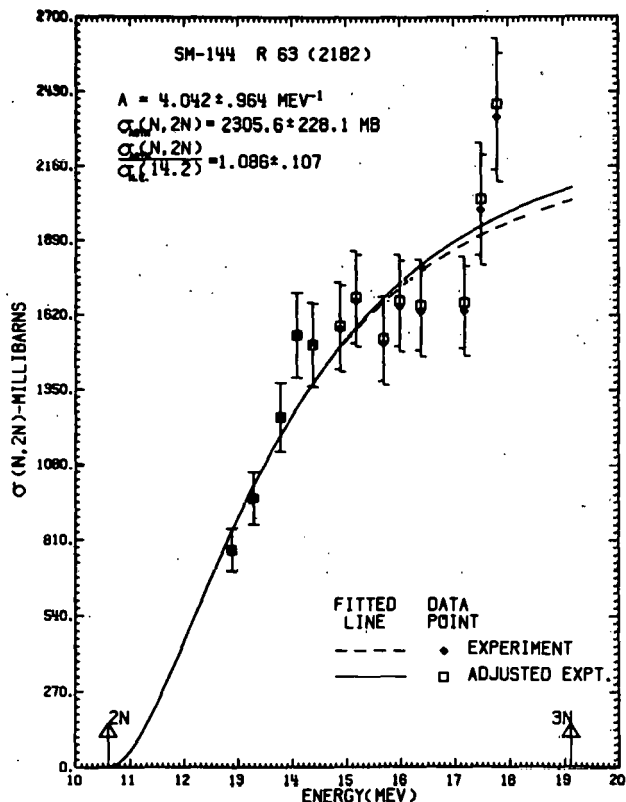


SM-144 ... FROM REF. R 63 (2182)

ENERGY (MEV)	N,2N CROSS SECTION (MB)	
	MEASURED, ERR	ADJUSTED, ERR
12.900	769.00 77.00	769.000 77.000
13.300	953.00 95.00	953.000 95.000
13.800	1247.00 125.00	1247.000 125.000
14.100	1544.00 154.00	1544.000 154.000
14.400	1508.00 151.00	1510.422 151.243
14.900	1569.00 157.00	1577.395 157.840
15.200	1670.00 167.00	1682.393 168.239
15.700	1516.00 152.00	1532.063 153.611
16.000	1650.00 165.00	1670.368 167.037
16.400	1631.00 163.00	1654.657 165.364
17.200	1634.00 163.00	1663.870 165.980
17.500	2000.00 200.00	2039.045 203.904
17.800	2336.00 234.00	2384.298 238.838

FITTED PARAMETERS
 LEVEL SPACING = 4.042 PLUS-OR-MINUS .964 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2305.63 PLUS-OR-MINUS 228.14 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2123.64 MB
 (N,2N) THRESHOLD = 10.62 MEV
 (N,3N) THRESHOLD = 19.13 MEV
 THIS ISOTOPE HAS 82 NEUTRONS, 62 PROTONS, (MASS = 144)
 NEUTRON EXCESS PARAMETER = .13889
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.0857 PLUS-OR-MINUS .1074
 N/SPACING = 20.267 A/SPACING = 35.626
 ERROR 4.838 ERROR 8.497



TM-169 ...FROM REF. T 60 (590)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
9.800	431.00 170.00	431.000 170.000	
10.350	665.00 270.00	665.000 270.000	
11.500	865.00 350.00	865.000 350.000	
12.300	934.00 370.00	934.000 370.000	
13.000	924.00 370.00	924.000 370.000	
13.850	955.00 380.00	955.000 380.000	
14.500	1032.00 410.00	1033.894 410.753	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.122 PLUS-OR-MINUS .066 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1031.82 PLUS-OR-MINUS 37.46 MB

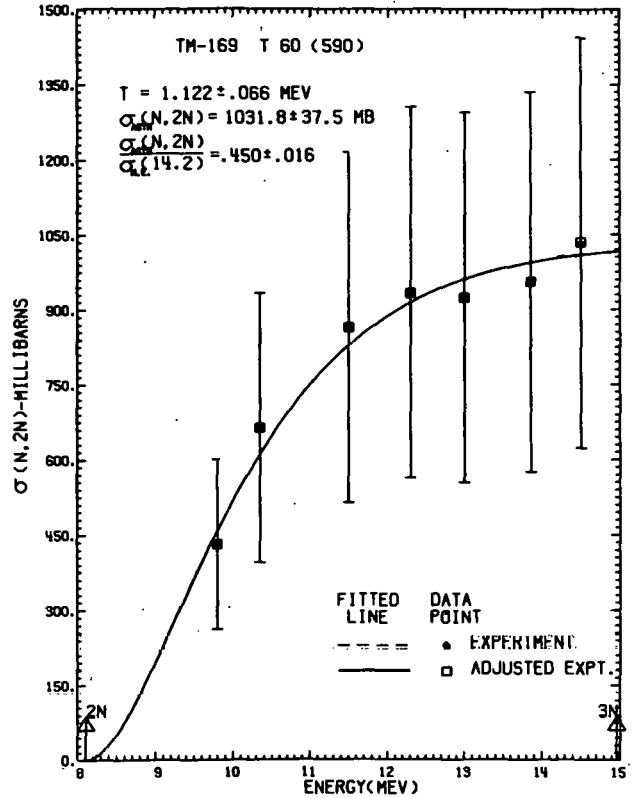
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2292.22 MB
 (N,2N) THRESHOLD = 8.11 MEV
 (N,3N) THRESHOLD = 14.96 MEV

THIS ISOTOPE HAS 100 NEUTRONS, 69 PROTONS, (MASS = 169)
 NEUTRON EXCESS PARAMETER = .18343

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4501 PLUS-OR-MINUS .0163

T*SQRT(N) = 11.220 T*SQRT(A) = 14.586
 ERROR .060 ERROR .858



TM-169 ...FROM REF. T 60 (590)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
9.800	431.00 170.00	431.000 170.000	
10.350	665.00 270.00	665.000 270.000	
11.500	865.00 350.00	865.000 350.000	
12.300	934.00 370.00	934.000 370.000	
13.000	924.00 370.00	924.000 370.000	
13.850	955.00 380.00	955.000 380.000	
14.500	1032.00 410.00	1033.894 410.753	

FITTED PARAMETERS

LEVEL SPACING = 7.225 PLUS-OR-MINUS 1.085 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1089.05 PLUS-OR-MINUS 55.05 MB

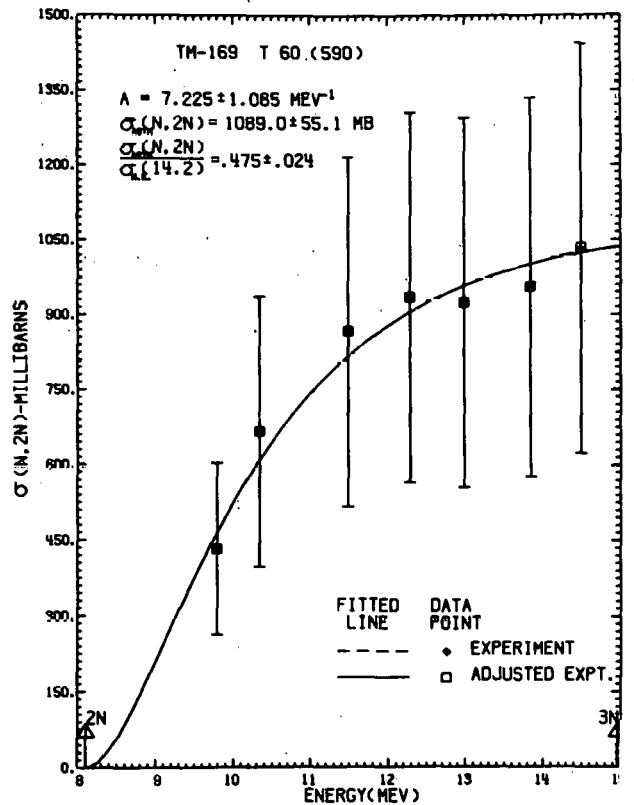
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2292.22 MB
 (N,2N) THRESHOLD = 8.11 MEV
 (N,3N) THRESHOLD = 14.96 MEV

THIS ISOTOPE HAS 100 NEUTRONS, 69 PROTONS, (MASS = 169)
 NEUTRON EXCESS PARAMETER = .18343

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .4751 PLUS-OR-MINUS .0240

N/SPACING = 13.841 A/SPACING = 23.391
 ERROR 2.040 ERROR 3.448



AU 197 ... FROM REF. T 60 (590)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
9.100	235.00	47.00	235.000	47.000	
9.350	388.00	76.00	388.000	76.000	
9.800	720.00	140.00	720.000	140.000	
10.350	1285.00	250.00	1285.000	250.000	
11.000	1615.00	310.00	1615.000	310.000	
11.500	1695.00	320.00	1695.000	320.000	
11.830	1899.00	361.00	1899.000	361.000	
12.100	1645.00	311.00	1645.000	311.000	
12.300	1824.00	351.00	1824.000	351.000	
12.800	2145.00	401.00	2145.000	401.000	
13.000	2074.00	391.00	2074.000	391.000	
13.850	2124.00	391.00	2124.000	391.000	
14.000	2214.00	412.00	2214.000	412.000	
14.500	2168.00	392.00	2170.865	392.518	

FITTED PARAMETERS

NUCLEAR TEMP. = 1.787 PLUS-OR-MINUS .149 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2731.89 PLUS-OR-MINUS 229.33 MB

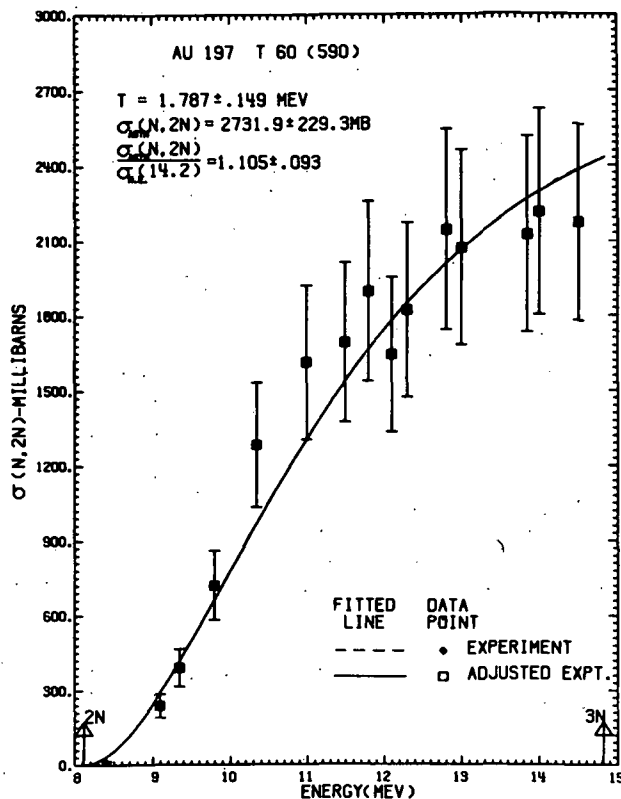
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2472.01 MB
 (N,2N) THRESHOLD = 8.12 MEV
 (N,3N) THRESHOLD = 14.82 MEV

THIS ISOTOPE HAS 118 NEUTRONS, 79 PROTONS, (MASS = 197)
 NEUTRON EXCESS PARAMETER = .19797

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.1051 PLUS-OR-MINUS .0928

T=SORT(N) = 19.412 T=SORT(A) = 25.082
 ERROR 1.619 ERROR 2.091



AU 197 ... FROM REF. T 60 (590)

ENERGY (MEV)	MEASURED	ERR	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
9.100	235.00	47.00	235.000	47.000	
9.350	388.00	76.00	388.000	76.000	
9.800	720.00	140.00	720.000	140.000	
10.350	1285.00	250.00	1285.000	250.000	
11.000	1615.00	310.00	1615.000	310.000	
11.500	1695.00	320.00	1695.000	320.000	
11.800	1899.00	361.00	1899.000	361.000	
12.100	1645.00	311.00	1645.000	311.000	
12.300	1824.00	351.00	1824.000	351.000	
12.800	2145.00	401.00	2145.000	401.000	
13.000	2074.00	391.00	2074.000	391.000	
13.850	2124.00	391.00	2124.000	391.000	
14.000	2214.00	412.00	2214.000	412.000	
14.500	2168.00	392.00	2170.865	392.518	

FITTED PARAMETERS

LEVEL SPACING = 2.215 PLUS-OR-MINUS .524 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 3438.49 PLUS-OR-MINUS 472.15 MB

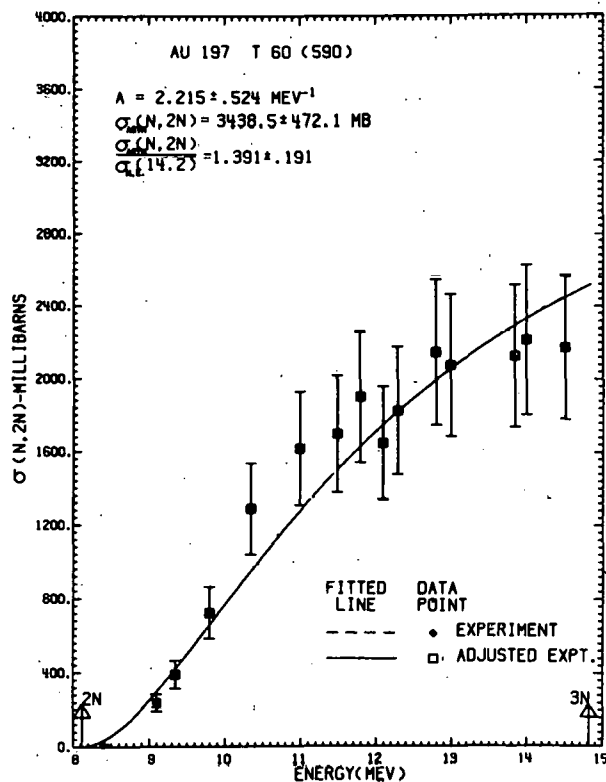
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2472.01 MB
 (N,2N) THRESHOLD = 8.12 MEV
 (N,3N) THRESHOLD = 14.82 MEV

THIS ISOTOPE HAS 118 NEUTRONS, 79 PROTONS, (MASS = 197)
 NEUTRON EXCESS PARAMETER = .19797

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.3910 PLUS-OR-MINUS .1910

N/SPACING = 53.273 A/SPACING = 88.939
 ERROR 12.603 ERROR 21.040

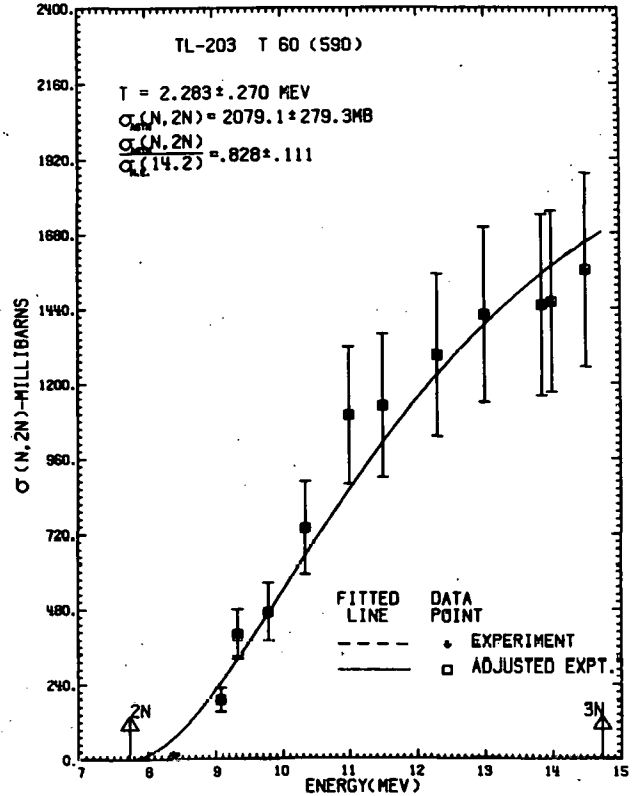


TL-203 ... FROM REF. T 60 (590)

ENERGY (MEV)	MEASURED, ERR		N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
9.100	190.00	38.00	190.000	38.000	190.000	38.000
9.350	400.00	80.00	400.000	80.000	400.000	80.000
9.800	470.00	94.00	470.000	94.000	470.000	94.000
10.350	740.00	150.00	740.000	150.000	740.000	150.000
11.000	1100.00	220.00	1100.000	220.000	1100.000	220.000
11.500	1130.00	230.00	1130.000	230.000	1130.000	230.000
12.300	1290.00	260.00	1290.000	260.000	1290.000	260.000
13.000	1420.00	280.00	1420.000	280.000	1420.000	280.000
13.850	1450.00	290.00	1450.000	290.000	1450.000	290.000
14.000	1460.00	290.00	1460.000	290.000	1460.000	290.000
14.500	1560.00	310.00	1561.907	310.379	1561.907	310.379

FITTED PARAMETERS
 NUCLEAR TEMP. = 2.283 PLUS-OR-MINUS .270 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2079.07 PLUS-OR-MINUS 279.25 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2509.65 MB
 (N,2N) THRESHOLD = 7.76 MEV
 (N,3N) THRESHOLD = 14.72 MEV
 THIS ISOTOPE HAS 122 NEUTRONS, 81 PROTONS, (MASS = 203)
 NEUTRON EXCESS PARAMETER = .20197
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = 1.113
 T*SQRT(N) = 25.217 T*SQRT(A) = 32.528
 ERROR 2.982 ERROR 3.847

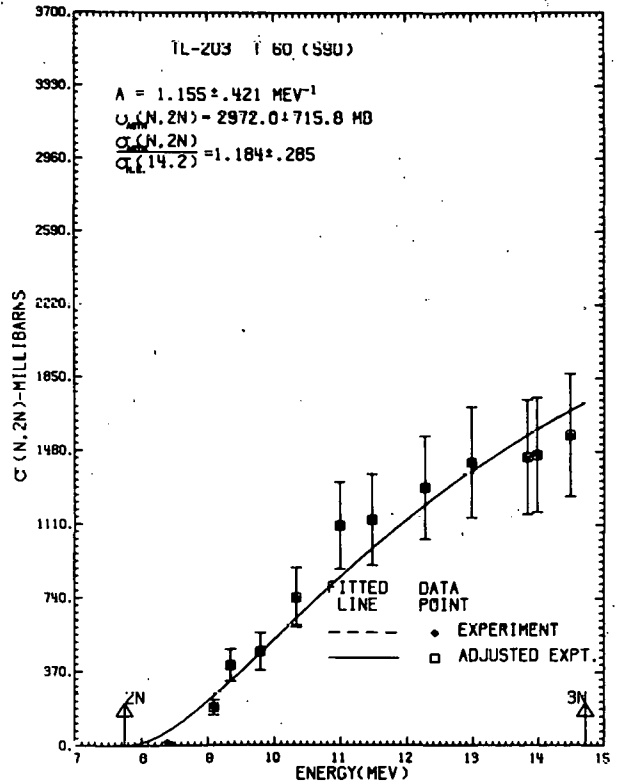


TL-203 ... FROM REF. T 60 (590)

ENERGY (MEV)	MEASURED, ERR		N,2N CROSS SECTION (MB)		ADJUSTED, ERR	
9.100	190.00	38.00	190.000	38.000	190.000	38.000
9.350	400.00	80.00	400.000	80.000	400.000	80.000
9.800	470.00	94.00	470.000	94.000	470.000	94.000
10.350	740.00	150.00	740.000	150.000	740.000	150.000
11.000	1100.00	220.00	1100.000	220.000	1100.000	220.000
11.500	1130.00	230.00	1130.000	230.000	1130.000	230.000
12.300	1290.00	260.00	1290.000	260.000	1290.000	260.000
13.000	1420.00	280.00	1420.000	280.000	1420.000	280.000
13.850	1450.00	290.00	1450.000	290.000	1450.000	290.000
14.000	1460.00	290.00	1460.000	290.000	1460.000	290.000
14.500	1560.00	310.00	1561.907	310.379	1561.907	310.379

FITTED PARAMETERS
 LEVEL SPACING = 1.155 PLUS-OR-MINUS .421 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2972.05 PLUS-OR-MINUS 715.84 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2509.65 MB
 (N,2N) THRESHOLD = 7.76 MEV
 (N,3N) THRESHOLD = 14.72 MEV
 THIS ISOTOPE HAS 122 NEUTRONS, 81 PROTONS, (MASS = 203)
 NEUTRON EXCESS PARAMETER = .20197
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = 1.184
 N/SPACING = 105.628 A/SPACING = 175.758
 ERROR 38.502 ERROR 64.064



PB-204 ...FROM REF. I 65 (603)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
10.070	940.00 99.00	940.000 99.000	
10.760	1347.00 139.00	1347.000 139.000	
11.400	1114.00 121.00	1114.000 121.000	
12.000	1297.00 89.00	1297.000 89.000	
12.050	1591.00 84.00	1591.000 84.000	
12.310	1622.00 88.00	1622.000 88.000	
12.400	1519.00 114.00	1519.000 114.000	
12.970	1685.00 90.00	1685.000 90.000	
14.000	1748.00 69.00	1748.000 69.000	

FITTED PARAMETERS

 NUCLEAR TEMP. = 1.027 PLUS-OR-MINUS .156 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1755.90 PLUS-OR-MINUS 108.56 MB

RELATED DATA

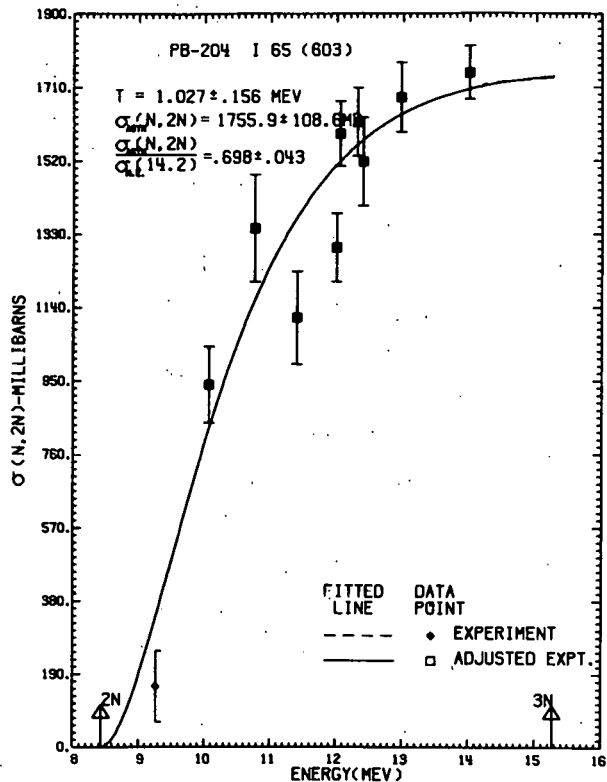
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2515.90 MB
 (N,2N) THRESHOLD = 8.44 MEV
 (N,3N) THRESHOLD = 15.26 MEV

THIS ISOTOPE HAS 122 NEUTRONS, 82 PROTONS, (MASS = 204)

NEUTRON EXCESS PARAMETER = .19608

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6979 PLUS-OR-MINUS .0432

T=SQRT(N) = 11.344 T=SQRT(A) = 14.668
 ERROR 1.723 ERROR 2.228



PB-204 ...FROM REF. I 65 (603)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
10.070	940.00 99.00	940.000 99.000	
10.760	1347.00 139.00	1347.000 139.000	
11.400	1114.00 121.00	1114.000 121.000	
12.000	1297.00 89.00	1297.000 89.000	
12.050	1591.00 84.00	1591.000 84.000	
12.310	1622.00 88.00	1622.000 88.000	
12.400	1519.00 114.00	1519.000 114.000	
12.970	1685.00 90.00	1685.000 90.000	
14.000	1748.00 69.00	1748.000 69.000	

FITTED PARAMETERS

 LEVEL SPACING = 9.331 PLUS-OR-MINUS 2.937 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1829.60 PLUS-OR-MINUS 137.85 MB

RELATED DATA

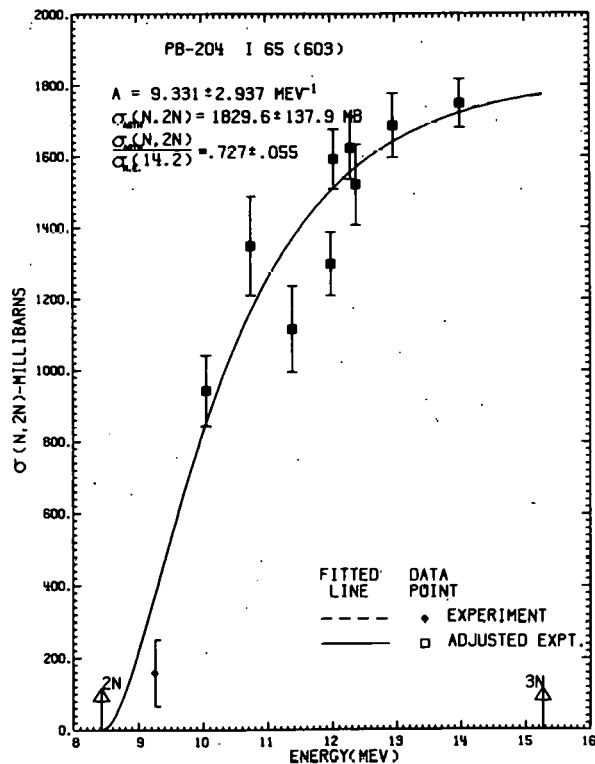
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2515.90 MB
 (N,2N) THRESHOLD = 8.44 MEV
 (N,3N) THRESHOLD = 15.26 MEV

THIS ISOTOPE HAS 122 NEUTRONS, 82 PROTONS, (MASS = 204)

NEUTRON EXCESS PARAMETER = .19608

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7272 PLUS-OR-MINUS .0548

N/SPACING = 13.075 A/SPACING = 21.863
 ERROR 4.115 ERROR 6.881



PB-204 ...FROM REF, T 60 (590)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ERR	ADJUSTED	ERR
10.100	471.00	190.00	471.000	190.000	
11.500	1000.00	400.00	1000.000	400.000	
12.300	1240.00	500.00	1240.000	500.000	
12.800	1330.00	530.00	1330.000	530.000	
14.000	1750.00	180.00	1750.000	180.000	

FITTED PARAMETERS

NUCLEAR TEMP. = 2.059 PLUS-OR-MINUS .144 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2312.82 PLUS-OR-MINUS 125.86 MB

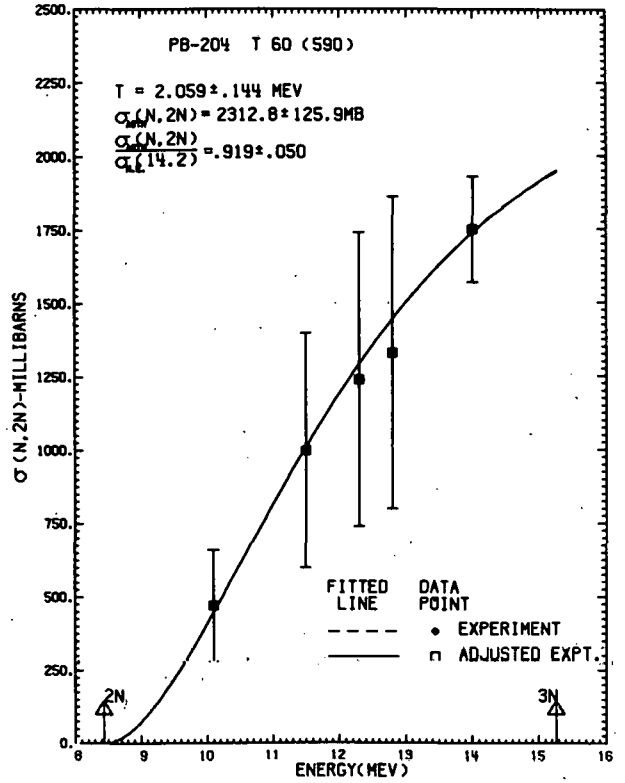
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2515.90 MB
 (N,2N) THRESHOLD = 8.44 MEV
 (N,3N) THRESHOLD = 15.26 MEV

THIS ISOTOPE HAS 122 NEUTRONS, 82 PROTONS, (MASS = 204)
 NEUTRON EXCESS PARAMETER = .19608

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .9193 PLUS-OR-MINUS .0500

T=SQRT(N) = 22.742 T=SQRT(A) = 29.408
 ERROR 1.591 ERROR 2.097



PB-204 ...FROM REF, T 60 (590)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ERR	ADJUSTED	ERR
10.100	471.00	190.00	471.000	190.000	
11.500	1000.00	400.00	1000.000	400.000	
12.300	1240.00	500.00	1240.000	500.000	
12.800	1330.00	530.00	1330.000	530.000	
14.000	1750.00	180.00	1750.000	180.000	

FITTED PARAMETERS

LEVEL SPACING = 1.772 PLUS-OR-MINUS .251 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2960.90 PLUS-OR-MINUS 211.07 MB

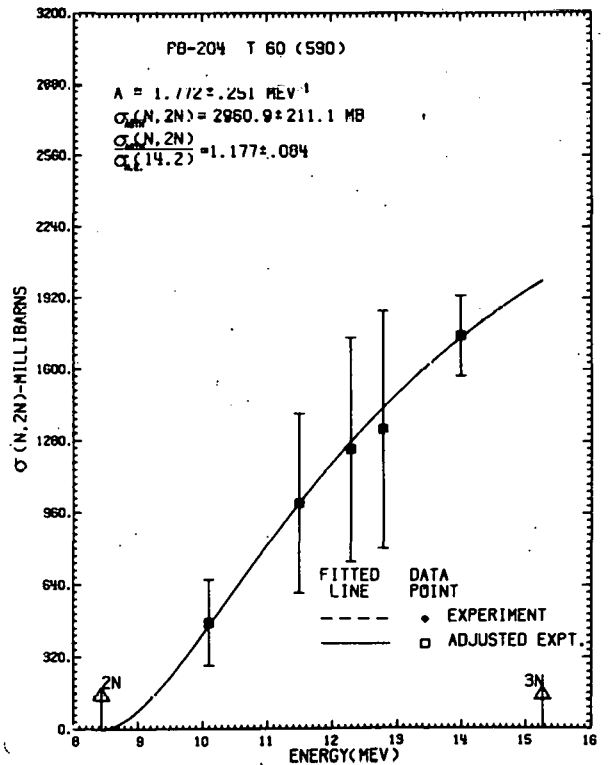
RELATED DATA

NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2515.90 MB
 (N,2N) THRESHOLD = 8.44 MEV
 (N,3N) THRESHOLD = 15.26 MEV

THIS ISOTOPE HAS 122 NEUTRONS, 82 PROTONS, (MASS = 204)
 NEUTRON EXCESS PARAMETER = .19608

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 1.1769 PLUS-OR-MINUS .0839

N/SPACING = 68.849 A/SPACING = 115.124
 ERROR 9.752 ERROR 16.307



TH-232 ...FROM REF. BU61 (659)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
7.280	603.00	28.00	603.000	28.000
7.590	976.00	45.00	976.000	45.000
7.840	1200.00	70.00	1200.000	70.000
8.010	1390.00	70.00	1390.000	70.000
8.610	1610.00	70.00	1610.000	70.000
9.020	1750.00	80.00	1750.000	80.000
9.630	1940.00	90.00	1940.000	90.000
10.030	1830.00	80.00	1830.000	80.000
10.420	1910.00	90.00	1910.000	90.000

FITTED PARAMETERS

NUCLEAR TEMP. = .703 PLUS-OR-MINUS .027 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1987.17 PLUS-OR-MINUS 55.11 MB

RELATED DATA

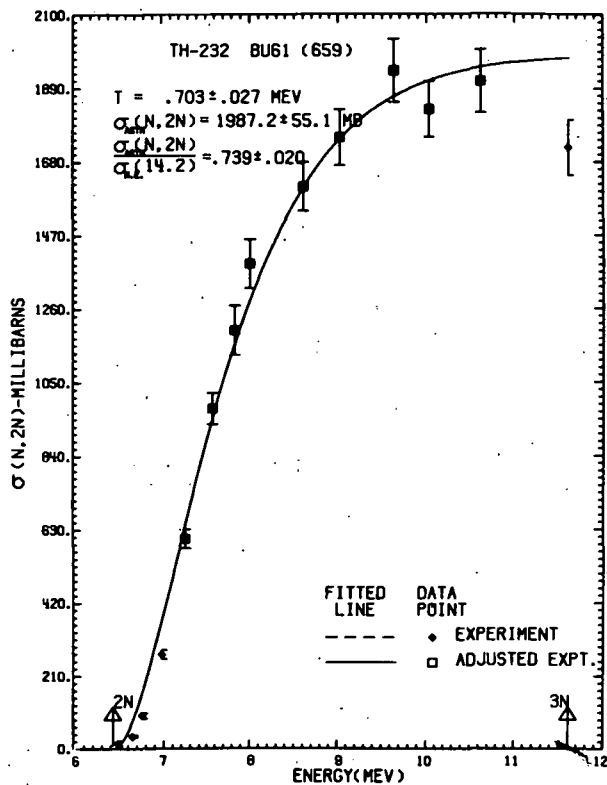
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2688.41 MB
 (N,2N) THRESHOLD = 6.46 MEV
 (N,3N) THRESHOLD = 11.61 MEV

THIS ISOTOPE HAS 142 NEUTRONS, 90 PROTONS, (MASS = 232)

NEUTRON EXCESS PARAMETER = .22414

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7392 PLUS-OR-MINUS .0205

T*SQRT(N) = 8.377 T*SQRT(A) = 10.708
 ERROR .322 ERROR .411



TH-232 ...FROM REF. BU61 (659)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED	ERR
7.280	603.00	28.00	603.000	28.000
7.590	976.00	45.00	976.000	45.000
7.840	1200.00	70.00	1200.000	70.000
8.010	1390.00	70.00	1390.000	70.000
8.610	1610.00	70.00	1610.000	70.000
9.020	1750.00	80.00	1750.000	80.000
9.630	1940.00	90.00	1940.000	90.000
10.030	1830.00	80.00	1830.000	80.000
10.620	1910.00	90.00	1910.000	90.000

FITTED PARAMETERS

LEVEL SPACING = 14.051 PLUS-OR-MINUS 1.410 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 2082.83 PLUS-OR-MINUS 81.53 MB

RELATED DATA

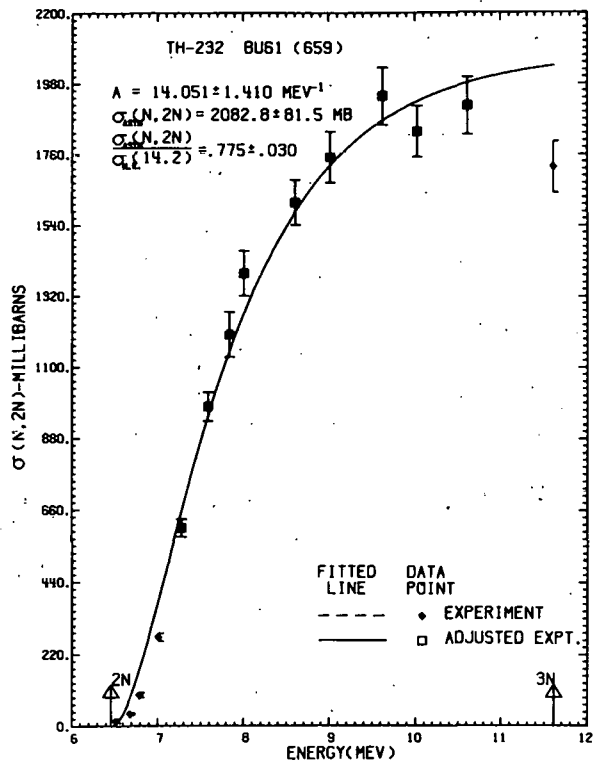
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2688.41 MB
 (N,2N) THRESHOLD = 6.46 MEV
 (N,3N) THRESHOLD = 11.61 MEV

THIS ISOTOPE HAS 142 NEUTRONS, 90 PROTONS, (MASS = 232)

NEUTRON EXCESS PARAMETER = .22414

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .7747 PLUS-OR-MINUS .0303

N/SPACING = 10.106 A/SPACING = 16.511
 ERROR 1.014 ERROR 1.697

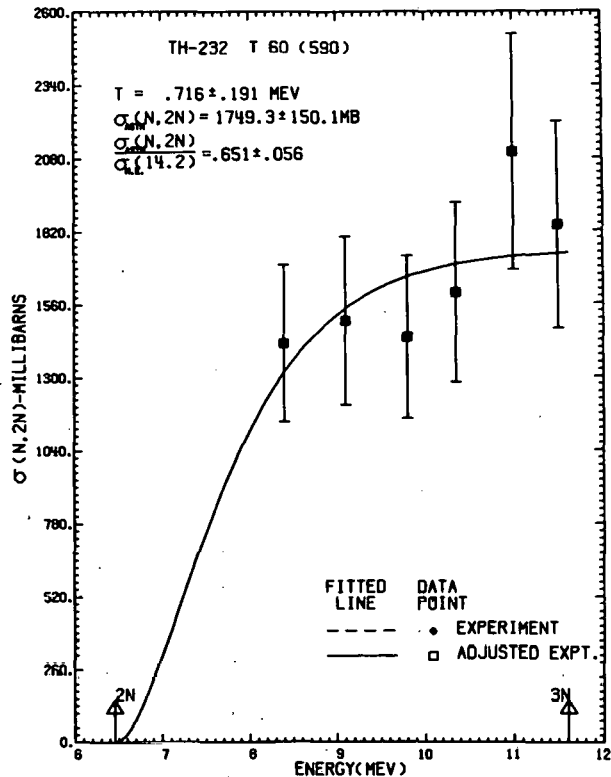


TH-232 ...FROM REF. T 60 (590)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
8.400	1420.00 280.00	1420.000 280.000	
9.100	1500.00 300.00	1500.000 300.000	
9.800	1440.00 290.00	1440.000 290.000	
10.350	1600.00 320.00	1600.000 320.000	
11.000	2100.00 420.00	2100.000 420.000	
11.500	1840.00 370.00	1840.000 370.000	

FITTED PARAMETERS
 NUCLEAR TEMP. = .716 PLUS-OR-MINUS .191 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1749.29 PLUS-OR-MINUS 150.09 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2688.41 MB
 (N,2N) THRESHOLD = 6.46 MEV
 (N,3N) THRESHOLD = 11.61 MEV
 THIS ISOTOPE HAS 142 NEUTRONS, 90 PROTONS, (MASS = 232)
 NEUTRON EXCESS PARAMETER = .22414
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6507 PLUS-OR-MINUS .0598
 T*SQRT(N) = 8.532 T*SQRT(A) = 10.906
 ERROR 2.276 ERROR 2.909

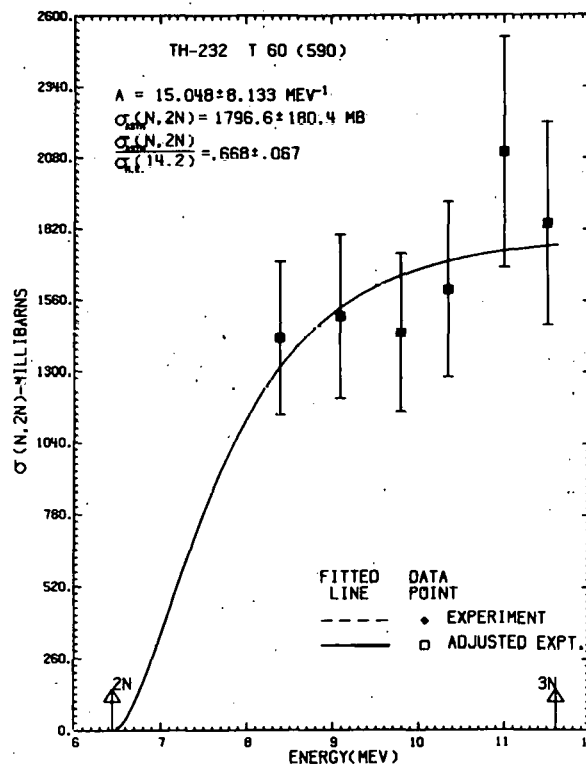


TH-232 ...FROM REF. T 60 (590)

ENERGY (MEV)	MEASURED, ERR	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
8.400	1420.00 280.00	1420.000 280.000	
9.100	1500.00 300.00	1500.000 300.000	
9.800	1440.00 290.00	1440.000 290.000	
10.350	1600.00 320.00	1600.000 320.000	
11.000	2100.00 420.00	2100.000 420.000	
11.500	1840.00 370.00	1840.000 370.000	

FITTED PARAMETERS
 LEVEL SPACING = 15.048 PLUS-OR-MINUS 8.133 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1796.59 PLUS-OR-MINUS 180.44 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2688.41 MB
 (N,2N) THRESHOLD = 6.46 MEV
 (N,3N) THRESHOLD = 11.61 MEV
 THIS ISOTOPE HAS 142 NEUTRONS, 90 PROTONS, (MASS = 232)
 NEUTRON EXCESS PARAMETER = .22414
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6683 PLUS-OR-MINUS .0671
 N/SPACING = 9.436 A/SPACING = 15.417
 ERROR 5.100 ERROR 8.333



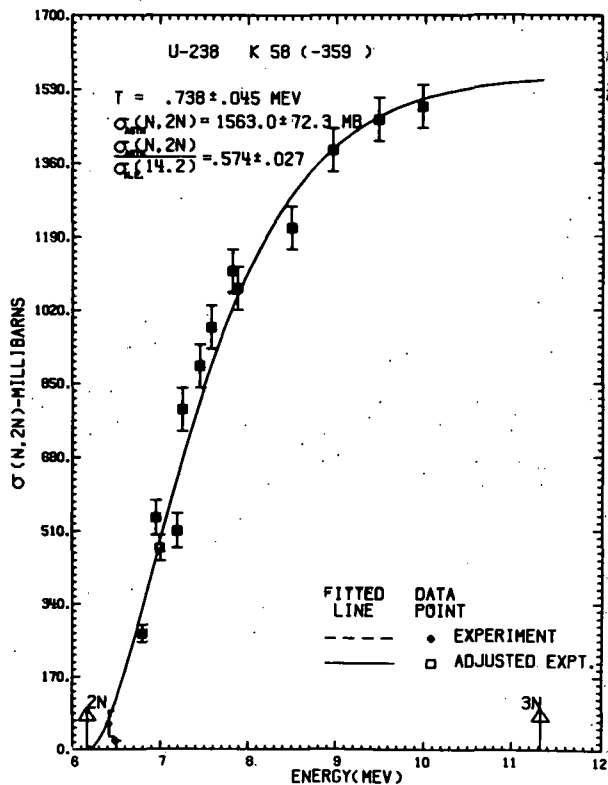
U-238 ... FROM REF. K 58 (-359)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
6.800	270.00	20.00	270.000 20.000
6.960	340.00	40.00	340.000 40.000
7.000	470.00	30.00	470.000 30.000
7.200	510.00	40.00	510.000 40.000
7.250	790.00	50.00	790.000 50.000
7.450	890.00	50.00	890.000 50.000
7.580	980.00	50.00	980.000 50.000
7.820	1110.00	50.00	1110.000 50.000
7.880	1070.00	50.00	1070.000 50.000
8.490	1210.00	50.00	1210.000 50.000
8.960	1390.00	50.00	1390.000 50.000
9.480	1460.00	50.00	1460.000 50.000
9.970	1490.00	50.00	1490.000 50.000

FITTED PARAMETERS
 NUCLEAR TEMP. = .738 PLUS-OR-MINUS .045 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1562.97 PLUS-OR-MINUS 72.32 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2724.89 MB
 (N,2N) THRESHOLD = 6.17 MEV
 (N,3N) THRESHOLD = 11.32 MEV

THIS ISOTOPE HAS 146 NEUTRONS, 92 PROTONS, (MASS = 238)
 NEUTRON EXCESS PARAMETER = .22689
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .5736 PLUS-OR-MINUS .0265
 T=SQRT(N) = 8.917 T=SQRT(A) = 11.385
 ERROR .544 ERROR .694



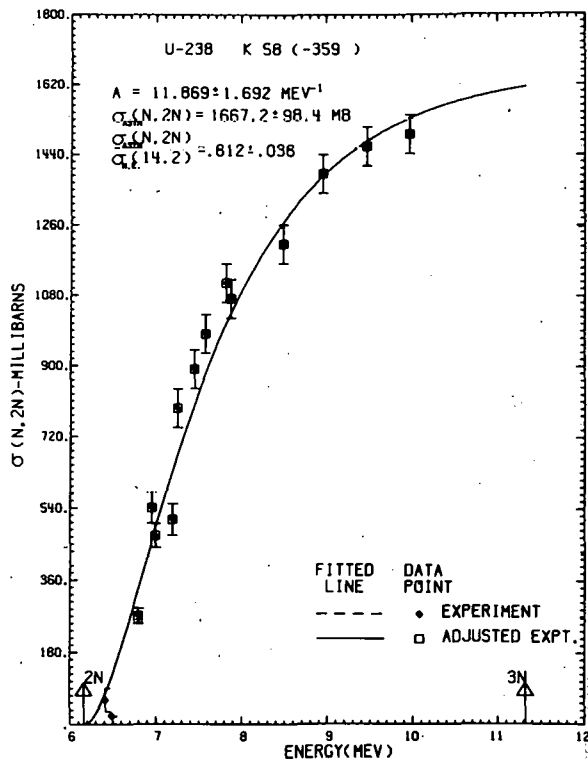
U-238 ... FROM REF. K 58 (-359)

ENERGY (MEV)	MEASURED	N,2N CROSS SECTION (MB)	ADJUSTED, ERR
6.800	270.00	20.00	270.000 20.000
6.960	340.00	40.00	340.000 40.000
7.000	470.00	30.00	470.000 30.000
7.200	510.00	40.00	510.000 40.000
7.250	790.00	50.00	790.000 50.000
7.450	890.00	50.00	890.000 50.000
7.580	980.00	50.00	980.000 50.000
7.820	1110.00	50.00	1110.000 50.000
7.880	1070.00	50.00	1070.000 50.000
8.490	1210.00	50.00	1210.000 50.000
8.960	1390.00	50.00	1390.000 50.000
9.480	1460.00	50.00	1460.000 50.000
9.970	1490.00	50.00	1490.000 50.000

FITTED PARAMETERS
 LEVEL SPACING = 11.869 PLUS-OR-MINUS 1.692 PER MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1667.22 PLUS-OR-MINUS 98.40 MB

RELATED DATA
 NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2724.89 MB
 (N,2N) THRESHOLD = 6.17 MEV
 (N,3N) THRESHOLD = 11.32 MEV

THIS ISOTOPE HAS 146 NEUTRONS, 92 PROTONS, (MASS = 238)
 NEUTRON EXCESS PARAMETER = .22689
 RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC = .6110 PLUS-OR-MINUS .0361
 N/SPACING = 12.301 A/SPACING = 20.052
 ERROR 1.754 ERROR 2.859



U-238 ... FROM REF. K 66 (359)

ENERGY (MEV)	MEASURED	ERR	ADJUSTED	ERR
6.800	300.00	20.00	300.000	20.000
6.960	590.00	50.00	590.000	50.000
7.000	520.00	40.00	520.000	40.000
7.200	560.00	50.00	560.000	50.000
7.250	870.00	70.00	870.000	70.000
7.450	980.00	80.00	980.000	80.000
7.580	1080.00	80.00	1080.000	80.000
7.820	1220.00	80.00	1220.000	80.000
7.880	1180.00	80.00	1180.000	80.000
8.490	1330.00	90.00	1330.000	90.000
8.960	1530.00	90.00	1530.000	90.000
9.460	1610.00	90.00	1610.000	90.000
9.970	1640.00	90.00	1640.000	90.000

FITTED PARAMETERS

NUCLEAR TEMP. = .770 PLUS-OR-MINUS .051 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1758.6 PLUS-OR-MINUS 107.34 MB

RELATED DATA

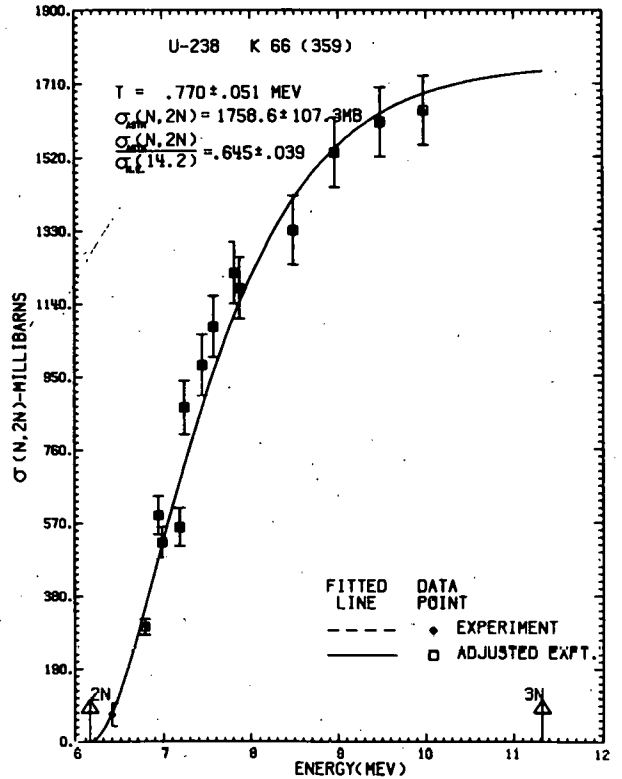
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2724.89 MB
 (N,2N) THRESHOLD = 6.17 MEV
 (N,3N) THRESHOLD = 11.32 MEV

THIS ISOTOPE HAS 146 NEUTRONS, 92 PROTONS, (MASS = 238)

NEUTRON EXCESS PARAMETER = .22689

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .645 PLUS-OR-MINUS .039

T*SQRT(N) = 9.304 T*SQRT(A) = 11.879
 ERROR .616 ERROR .787



U-238 ... FROM REF. K 66 (359)

ENERGY (MEV)	MEASURED	ERR	ADJUSTED	ERR
6.800	300.00	20.00	300.000	20.000
6.960	590.00	50.00	590.000	50.000
7.000	520.00	40.00	520.000	40.000
7.200	560.00	50.00	560.000	50.000
7.250	870.00	70.00	870.000	70.000
7.450	980.00	80.00	980.000	80.000
7.580	1080.00	80.00	1080.000	80.000
7.820	1220.00	80.00	1220.000	80.000
7.880	1180.00	80.00	1180.000	80.000
8.490	1330.00	90.00	1330.000	90.000
8.960	1530.00	90.00	1530.000	90.000
9.460	1610.00	90.00	1610.000	90.000
9.970	1640.00	90.00	1640.000	90.000

FITTED PARAMETERS

LEVEL SPACING = 10.602 PLUS-OR-MINUS 1.685 MEV
 ASYMPTOTIC (N,2N) CROSS SECTION = 1901.52 PLUS-OR-MINUS 147.77 MB

RELATED DATA

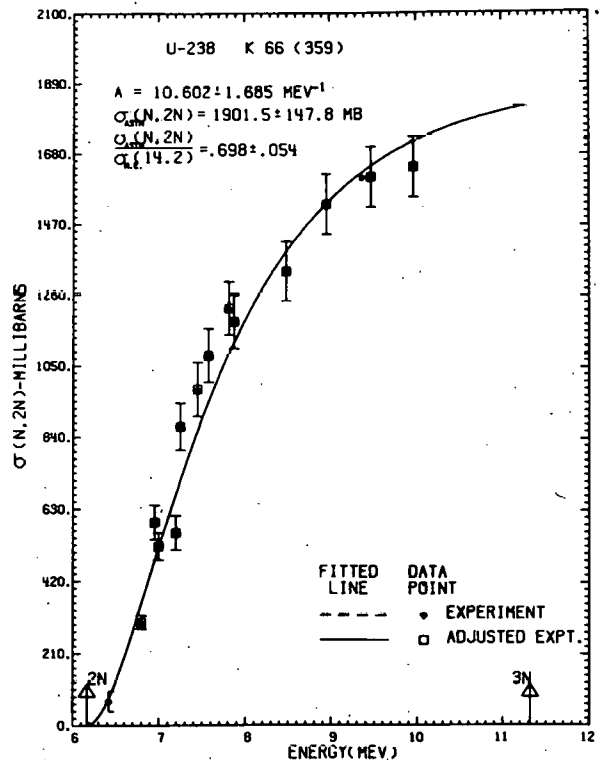
NON-ELASTIC CROSS SECTION AT 14.2 MEV = 2724.89 MB
 (N,2N) THRESHOLD = 6.17 MEV
 (N,3N) THRESHOLD = 11.32 MEV

THIS ISOTOPE HAS 146 NEUTRONS, 92 PROTONS, (MASS = 238)

NEUTRON EXCESS PARAMETER = .22689

RATIO OF ASYMPTOTIC (N,2N) TO 14.2 MEV NON-ELASTIC
 .6978 PLUS-OR-MINUS .0542

N/SPACING = 13.771 A/SPACING = 22.449
 ERROR 2.189 ERROR 3.568



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