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STATUS OF EXPERIMENTAL AND EVALUATED DISCRETE γ-RAY PRODUCTION AT E_n=14.5 MeV

Final Report of Research Contract 7809/RB, performed under the CRP on Measurement, Calculation and Evaluation of Photon Production Data

S. P. Simakov[1], A. Pavlik[2], H. Vonach[2], S. Hlaváč[3]

[1]Institute of Physics and Power Engineering, Obninsk, Russia
[2]Institut für Radiumforschung und Kernphysik, University of Vienna, Austria
[3]Institute of Physics SAS, Bratislava, Slovakia

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[1]Institute of Physics and Power Engineering, Obninsk, Russia
[2]Institut für Radiumforschung und Kernphysik, University of Vienna, Vienna, Austria
[3]Institute of Physics SAS, Bratislava, Slovakia

Abstract

The aim of the paper is to collect and examine the status of the experimental data on discrete γ-ray production cross sections via (n,xγ) reaction for practically important nuclei at 14 MeV incident neutron energy. From this point of view, the available experimental cross sections for all reliable γ-ray transitions, measured by high energy resolution in-beam technique, were compiled in the report. This experimental base was critically checked from the point of view of influence of different experimental factors and evaluated experimental cross sections and uncertainties were received. The present status of experimental data against practical demands was established.

The FENDL-1, ENDF/B6 and BROND-2 libraries were checked as well to search whether the discrete photon production cross sections are presented there and how they agree with available experimental data.

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CONTENTS

1. Introduction

Neutron induced γ-ray production cross-sections are needed for design of nuclear plants, thermonuclear reactors, neutron therapy, geology and other applied neutronics works [1-6]. Besides the practical importance, they provide valuable information base for understanding the nuclear structure and neutron reaction mechanisms [7]. The 14 MeV incident neutron energy point is still continuing to be of high importance as a good "reference" point for experiment and theory, in which measuring techniques and model parameters can be checked and compared. From this point it is very important to have a comprehensive and detailed "picture" of present status of experimental and evaluated data on photon production cross sections, showing for what nuclei and with what accuracy the photon production cross sections have been measured and how they are predicted by widely used evaluated data libraries.

In the present work all practically important nuclei, included in WRENDA [1] or Fusion Evaluated Data Library FENDL-1/E [8], were regarded. The all reliable measured discrete γ-rays transitions for these nuclei were compiled. The experimental data were analyzed and, if necessary, were corrected for absolute normalization, angular dependence of γ-rays etc. The estimated average cross sections and its uncertainties were obtained by weighting individual experimental data. The up-today status of experimental data and FENDL-1, ENDF/B6 [9] and BROND-2 [10] libraries were finally estimated.

2. Frames of compilation

The list of nuclei selected for compilation are presented in the Table 1. These are materials which are requested in WRENDA 93/94 [1] or included in FENDL-1/E library [8]. Totally 36 elements plus 8 enriched isotopes from Li to Bi were selected for the compilation. The experimental information, measured for enriched isotopes, was regarded additionally to the data for natural elements. About 1050 experimental points were collected for present compilation.

As for incident neutron energy, the experiments made with neutrons in the vicinity of 14 MeV energies (13.0 - 16.5 MeV) have been included in the survey. These measurements have been performed usually at neutron generates, which produce monoenergetic neutrons, or sometimes at linacs, which produce the white neutron spectrum. In the last case the experimental data corresponding to the energy bins close to 14 MeV were selected for compilation.

In γ-production experiments the different types of γ-ray detectors, which differs by energy resolution, efficiency and other parameters, are used. But for our compilation of discrete γ-ray transitions, the energy resolution is most important parameter. So we has selected the experiments, in which the high purity germanium HPGe, lithium drifted germanium Ge(Li) or sodium-iodine NaI(Tl) detectors were used. Such detectors typically have the energy resolution from 2 - 7 keV (HPGe and Ge(Li)) to 50 - 80 keV (NaI(Tl)) for γ-rays with energy around 1 MeV. We skipped scarce experiments with hydrogen containing detectors (e.g., NE213 scintillators), which have energy resolutions of hundreds keV.

Nevertheless the energy resolution of γ-ray detectors is not always adequate to extract cross sections for small intensive γ-ray transitions, which lye close to the other intensive line. To escape the ambiguity we exclude from this compilation the transitions with obviously large admixture of other lines, the low intensive transitions not confirmed by other experiments or not clearly identified with known level scheme.

The measurement technique used for photon production measurements is in-beam spectroscopy. Sometimes it is supplemented by time of flight selection of γ-rays from fast neutrons in those experiments where pulsed 14 MeV neutron source is available. In last case only prompt part (emitted in the time window usually of dozens nanoseconds) of total production cross-section is detected. This is why we distinguish between prompt and prompt + delayed data.

The experiments, which have been performed (published) before 1960 year, were omitted, since the experimental equipment and methods used looks obsolete.

3. Compilation of photon production experimental data

The numerical experimental data on discrete γ-ray production cross-sections from (n,xγ) reactions at 14 MeV neutron energy were collected from original publications (CINDA issues were used as a guide), EXFOR Library (CSIRS data base of IAEA accessed via Internet) and from private communications with authors. The list of literature references and EXFOR entry numbers selected for compilation are summarized in Table. 2.

The experimental production cross sections for discrete γ-rays from original works are collected in Table 3. The structure of this main Table is following.

Column 1 - the energy of γ-ray in keV; 2 - producing reaction; 3 - decay scheme (initial and final levels, their spins and parities) and speed of process (prompt, delayed or sum); 4 - incident neutron energy in MeV; 5 - range of angles, at which the γ-ray were measured, in degrees; 6 - the material (chemical compound), sizes (mm) and weight (g) of the sample, whether the data were corrected for attenuation of neutron and γ-ray fluxes and multiple neutron scattering in the sample (+) or not (-); 7 - type of the γ-detector; 8 - experimental cross sections in mb (if cross-section were reported by author as angular differential, than it was simply multiplied by 4π); 9 - first author of the work and 10 - year of publication.

The meaning of other columns will be described below.

The information for every nuclide is preceded by its charge number, the name and the mass number in the case of monoisotope or measurement with enriched sample. The value in the parenthesis shows the natural abundance of the isotope(s).

Table 3, the largest table of the compilation, gives first impression on the parameters of experiments, availability of experimental data and their quality (spread).

4. Critical review of experimental data base

Experimental data base, collected in the Table 3, was further checked from the following points of view: (1) the procedure of absolute normalization of the cross sections; (2) correction for angular dependence of γ-ray emission; (3) interpolation of cross-section to one (selected) incident neutron energy; (4) rejection of obviously erroneous and unresolved experimental data.

4.1 Renormalization of experimental data

The experimental data were analyzed from the point of the absolute normalization procedure, used by authors of experimental works. Usually the absolute values of experimental cross sections are calculated either directly:

$$\sigma(E_\gamma) = \frac{N(E_\gamma)}{\varepsilon(E_\gamma)} \frac{1}{M} \frac{1}{F_n} cor(E_n, E_\gamma) \qquad (1)$$

or relatively to another known (reference) cross sections $\sigma_{ref}(E_{ref})$ for production of γ-ray with energy E_{ref}

$$\sigma(E_\gamma) = \sigma_{ref}(E_{ref}) \frac{N(E_\gamma)}{N(E_{ref})} \frac{\varepsilon(E_{ref})}{\varepsilon(E_\gamma)} \frac{M_{ref}}{M} \frac{cor(E_n, E_\gamma)}{cor_{ref}(E_n, E_{ref})} \qquad (2)$$

where:
$N(E_\gamma)$ - peak net area,
$\varepsilon(E_\gamma)$ - detector efficiency,
M -number of nuclei in the sample
F_n - neutron flux at sample point
$cor(E_n, E_\gamma)$ - correction for attenuation and multiple scattering in the sample
subscribe index "ref" - denote reference cross-sections, γ-ray energy etc.

These formulas show that the experimental data should be checked and possibly renormalized taking into account new (update) reference cross-sections, used in the old experiments for absolute normalization of γ-yield.

For this reason we collected in the Table 4 the information about methods used for absolute normalization of cross-sections. It shows that major part of experimental works used direct measurement of neutron flux without any reference cross-section. The neutron flux (see (1)) was determined by counting the associated α-particles or was measured by calibrated Long Counter, scintillation counter or proton-recoil telescope, which efficiency was calculated on the base of well known n-p scattering cross sections. It is obvious that correctness of such methods could not be checked without exact knowledge of experimental set-up, details of calculating procedure etc., but basically these methods give the high accuracy.

In some experimental works the reference cross sections were indeed used for absolute calibration of neutron flux (e.g., activation reactions $^{27}Al(n,\alpha)$, $^{93}Nb(n,2n)$ or $^{63}Cu(n,2n)$) or for normalization of measured cross section against other one (e.g., $^{28}Si(n,x\gamma)$ producing 1779 keV γ-rays, $^{52}Cr(n,x\gamma)$ - 1434 keV or $^{56}Fe(n,x\gamma)$ - 847 keV). For such experiments the type and value of used reference cross sections were looked for in the publications and summarized in the Table 4. The cases, when such information was not available, are denoted by "No infrom" label. The up-today values for these reactions are listed in next column of Table 4. The correction factor, taking into account the change of reference cross sections, is listed in column 11 of Table 3.

4.2 Correction for angular dependence

The angular distribution of discrete γ-rays could be presented as expansion of even Legengre polynomials:

$$\sigma_\gamma(E_\gamma,\theta_\gamma) = \frac{\sigma_\gamma(E_\gamma)}{4\pi} \times (1 + b_2(E_\gamma) \times P_2(\theta_\gamma) + ...) \qquad (3)$$

Usually the terms with orders more than 2 are negligibly small. At 55 and 125 degrees the polynomial P_2 is equal zero, so the angle-integrated cross sections $\sigma_\gamma(E_\gamma)$ could be calculated from measured at these angles by 4π multiplying. In the case of other angles, after multiplying by 4π the cross section should be corrected by the factor $1/(1+b_2 \times P_2(\theta)+...)$. The Table 3 contains the detector angle in column 5, the experimental cross-sections multiplied by 4π in column 8 and angular anisotropy correction factor in column 12.

Regrettably. but the information about angular anisotropy is rather scarce. There are few experimental works. in which angular distributions of discrete γ-rays were measured. In such cases the values of b_n were taken from theses experimental data. Sometimes b_n coefficients were derived from ENDF/B6. Additionally basic physics principle was taken into account: if the difference between initial and final states meets the rule $|I_i - I_f| < 2$ and $|I_i + I_f| < 2$, then corresponding angular distribution have to be isotropic. The cases, when information about angular distribution was unavailable, are denoted by question mark in the column 12 of Table 3. The uncertainty of such experimental cross sections were quardratically increased by 5%. The last value corresponds the mean correction factor applied for cross section measured at 90°.

4.3 Interpolation to 14.5 incident neutron energy

The Table 3 shows that incident neutron energies are slightly different in different experiments - they spread from 13.0 to 16.5 MeV, but most of them are concentrated in 14.0 - 15.0 MeV interval. This difference of incident energies could be one of the reason of additional scattering of γ-ray production cross sections measured in different experiments. So we have interpolated all experimental cross sections to one incident neutron energy, which was selected as 14.5 MeV:

$$\sigma_\gamma(E_\gamma, 14.5) = \sigma_\gamma(E_\gamma, E_n) + \frac{d\sigma_\gamma(E_\gamma)}{d\,E_n} \times (E_n - 14.5) \quad (4)$$

where;

$\sigma_\gamma(E_\gamma, E_n)$ - experimental cross section for production of γ-ray with energy E_γ at incident neutron energy E_n

$d\sigma_\gamma(E_\gamma)/dE$ - energy gradient of cross sections.

The energy gradients were derived from ENDF/B6 library or from experimental data, when they were available. The values of the correction (shift of cross section in mb units - the second term of right part of equation (4)) are listed in the column 13 of the Table 3.

4.4 Elimination of obviously wrong data, unreal small uncertainties and processing the data which was not corrected for neutron multiple scattering in the sample

The experimental data of different authors usually scatters around average typically by factor of 2. This is considerably higher then usually reported uncertainties, which have the order of 10-30%. But for some transitions the experimental data of one author deviate strongly from main group of other ones. The experimental cross-section, which deviates from average usually by factor exceeds 3, were regarded as erroneous and were skipped (but final decision was taken after analyses of all known information about this experiment). The skipped data are denoted by sign "(s)" in the column 14. For example, the cross section for production of 983 keV γ-ray transitions in ^{28}Si, reported by Zong-Reng in 1979 (see Table 3), was skipped, since it exceeds 4 times the data of others 3 authors. The possible reason of such deviation may be the unresolved admixture of 975 keV transition. So we pay especial attention to the cases when the energy difference between two γ-ray transitions are compared with energy resolution of NaI detector.

It should be noted that some experiments, e.g. data of Roturier-1966 and McKinney-1972, are rather often disagree with other data.

The reported uncertainties less than 5% were regarded as underestimated, taking into account our own experience in measuring the γ-ray production cross-sections. Such uncertainties were increased by quardratically adding the 5% relative error.

As the column 6 of the Table 3 and the Table 5 show, some authors did not corrected their results for effects connected with neutron multiple scattering in the sample. Since the estimation of the corrections needs complicated Monte-Carlo calculations and sometimes there is no information about the parameters of the sample used, we chosen following procedure. This correction was assumed to be negligible for γ-rays transitions resulted from high threshold reactions, e.g. (n,2n), (n,α), (n,t) or started from 4-5 MeV excited levels, populated in (n,n') reaction. For other transitions we added 10% error to the uncertainties reported by the author.

5. Evaluation of weighted experimental data

After application of corrections, described above, the individual cross sections were collected in the column 14 of the Table 3. The data were further used for the evaluation of the estimated cross-sections and its uncertainties.

The evaluated experimental cross sections for particular γ-ray transition with energy E_γ were calculated from the individual ones $\sigma_i(E_\gamma)$, taking into account the relative uncertainties $\Delta\sigma_i(E_\gamma)/\sigma_i(E_\gamma)$ as a weighting factor:

$$\sigma(E_\gamma) = \frac{\sum_{i=1}^{n} \sigma_i(E_\gamma) / (\Delta\sigma_i(E_\gamma)/\sigma_i(E_\gamma))^2}{\sum_{i=1}^{n} 1/(\Delta\sigma_i(E_\gamma)/\sigma_i(E_\gamma))^2} \qquad (5)$$

The estimated uncertainties of the cross sections for the specific transition were calculated as maxima of the internal (the weighted quadratic sum of original experiments uncertainties) and the external (the weighted quadratic sum of deviations from average) ones:

$$\Delta\sigma^{\text{int}}(E_\gamma) = \frac{\sqrt{\sum_{i=1}^{n} \Delta\sigma_i^2(E_\gamma)/(\Delta\sigma_i(E_\gamma)/\sigma_i(E_\gamma))^4}}{\sum_{i=1}^{n} 1/(\Delta\sigma_i(E_\gamma)/\sigma_i(E_\gamma))^2} \qquad (6a)$$

$$\Delta\sigma^{ext}(E_\gamma) = \sqrt{\frac{\sum_{i=1}^{n}(\sigma_i(E_\gamma) - \sigma(E_\gamma))^2 \times 1/(\Delta\sigma_i(E_\gamma)/\sigma_i(E_\gamma))^2}{(n-1)\times\sum_{i=1}^{n} 1/(\Delta\sigma_i(E_\gamma)/\sigma_i(E_\gamma))^2}} \qquad (6b)$$

Typically the external uncertainties are usually larger, except in the cases when the differences between the cross sections, measured in two or three laboratories are less then reported errors.

The estimated experimental γ-ray production cross-sections and its uncertainties for every γ-ray transition, calculated in the present work, are listed in the Tables 5 (Li to F) and 6 (Na to Bi).

For several γ-transitions, the large statistical ensemble is available (number of experiments exceeds 5), thus the values, listed in the Tables 5 and 6, are indeed a good estimations of the cross-sections and its uncertainties. But for many other γ-rays transitions there are too few or only one measurement.

The Fig. 1 shows available experimental data base for 4439 keV γ-ray production of cross-section in C(n,n') reaction. The top part of this figure shows the energy dependence of the cross section, the middle - distribution of the results of individual experiments. It is seen that spread of the individual results (30%) is larger then the average reported errors (10-15%), that indicate that authors usually underestimated the real experimental uncertainties.

The statistical chart of the cross-sections obtained after applying the corrections, described above, shows that experimental data becomes to agree better each other. It means that some factors, resulting to scattering of experimental cross-sections, were partly removed. This figure also clearly shows that σ = 440 mb of Morgan 1971 at 13.0 MeV is out of all other data, so it was skipped.

The similar analyses of available experimental data base for production of 847 keV γ-rays in Fe(n,xn) reaction are shown in Fig. 2. In this case the increasing of the agreement of deferent data after applied corrections is not so visible.

So we can conclude that renormalization to the up-date reference standards, correction for angular anisotropy and interpolation to one incident energy do not remove the main reason of the spread of individual experimental data.

The maximum number of measurements, 21 experiments, have been done for 847 keV transition in Fe(n,n')^{56}Fe reaction; 21 - for 3002 keV and 17 - for 2211 keV in ^{27}Al(n,n')^{27}Al; 19 - for 4439 keV transition in C(n,n')^{12}C reaction. The estimated uncertainty for these cross sections is 5 - 9 % (see Tables 5 and 6). So these γ-ray production cross-sections could be recommended as a reference cross-sections for the tasks, where 10 % accuracy is acceptable.

6. Status of Experimental Data

The WRENDA requirements are usually formulated as requests for accuracy of total and energy-angular differential cross sections. For quantitative comparison with practical demands and estimation of the status of experimental and evaluated data, the relative uncertainty of the total (sum of all) discrete production cross-sections σ and uncertainty of energy-differential (averaged over available discrete transitions) spectra S were calculated:

$$\Delta\sigma / \sigma = \frac{\sqrt{\sum_{E_\gamma} (\Delta\sigma(E_\gamma))^2}}{\sum_{E_\gamma} \sigma(E_\gamma)}; \Delta S / S = \frac{\sum_{E_\gamma} (\sigma(E_\gamma) \times (\Delta\sigma(E_\gamma) / \sigma(E_\gamma))}{\sum_{E_\gamma} \sigma(E_\gamma)} \qquad (7)$$

The estimated experimental data uncertainties are compared with WRENDA requests in Table 7 and Figure 4. From this comparison the status of the experimental data could be finally derived. It is regarded as satisfied (Y) if the uncertainties of both total and differential cross sections are less then the requested one, as unsatisfied (N) - if greater, and intermediate (YN) - if the total cross section meets the request and differential one does not. The symbol Y(?) denotes that, despite the experimental data satisfy the requirements, they were measured only in one experiment.

As Table 7 and Figure 4 show the uncertainty of total discrete production cross section is less then 10-15% (typical WRENDA request) for many elements, except ^{6}Li, Be, Ge. From the point of view of energy-differential uncertainty, additionally following elements do not meet practical requirements: F, Cl, K, Ca, Ge, Pb, Bi.

The ^{6}Li, ^{52}Cr, ^{56}Fe, Nb, Mo, Ge and I were measured only in one experimental work, so the other at least one independent experiment is needed.

It should be noticed that for Zr, Sn, Cs, Ba, Ta and W there are no measurements of discrete photon production cross sections at all.

7. Comparison of Evaluations with Experiment

Evaluated data from FENDL-1, ENDF/B6 and BROND-2 libraries are shown in the Tables 5 -7. Since FENDL-1 is a compilation of evaluations from ENDF/B6, BROND-2 and JENDL-3, the values in these Tables are identical sometimes.

Table 5 contains the light elements from lithium isotopes to fluorine, for which γ-production cross sections are presented in evaluations as a discrete transitions between excited levels of residual nuclei (inter-levels cascades). The cross-sections could be derived either from combinations of data from Files 3 (levels excitation cross sections) and File 12 (multiplicities or transition probability arrays) or directly from File 13 (photon production data). The data processing have been done using REBUS package [11] and own-written FORTRAN code.

For heavier elements from sodium to bithmuth, listed in the Table 6, the evaluated data libraries usually contains two type photon production cross-sections.

First type, as for light elements, - a discrete cross-sections for γ-ray transitions between excited levels of residual nuclei. Such cross section are listed in column σ_d. Second type is a continuos photon energy spectra stored in File 6 (energy-angular distributions for secondary neutrons and photons) or in File 15 (continues photon energy spectra). These spectra could be smoothed, without any peaks (such spectra shape is denoted by “S”) or complex (the combination of the peaks and of the continues parts - is denoted by “C”). The examples of smoothed and complex spectra are shown in Fig. 3. The energy bins used in evaluated files equal 25-50 keV or even more. So it is obvious that γ-rays production cross sections could be correctly derived only for the strongest γ-transitions from the complex type spectra. Such data are listed in column marked as σ_c.

The sum of these contributions (inter-levels cascades and discrete intensities from continuous energy distributions) were regarded as an evaluated discrete γ-rays productions cross sections.

Besides evaluated photon production cross sections $\sigma_{ev}(E_\gamma)$ Tables 5 and 6 contains the estimation of prediction quality for **specific γ-ray transition** with energy E_γ:

$$Q(E_\gamma) = (\sigma^{eval}(E_\gamma) - \sigma^{\exp}(E_\gamma)) / \Delta\sigma^{\exp}(E_\gamma) \qquad (8)$$

The prediction quality could be regarded as satisfied if Q-value belongs to the interval (-1, 1). The parameter Q is listed in the Table 5, whereas in the Table 6 it was calculated for the sum $\sigma_c + \sigma_d$ or only for σ_d (σ_c) discrete (continues) part of photon production cross section, available from evaluated files.

The Table 5 shows that for light elements all measured γ-ray transition are included in evaluated libraries. The quality of agreement of evaluated cross sections and experimental ones are very different for different transitions and elements: Q ranges from 1 (good agreement) to 10 (difference exceeds the experimental uncertainty ten times).

For the sake of estimation the quality of prediction of discrete γ-production cross section by evaluated data libraries for the **whole element**, the quality of prediction for the total Q_{tot} and averaged over evaluated energy-differential Q_{dif} discrete production cross sections were regarded:

$$Q_{tot} = (\sigma^{eval} - \sigma^{\exp}) / \Delta\sigma^{\exp}; Q_{dif} = \frac{\sum_{E_\gamma} \sigma^{eval}(E_\gamma) \times |\sigma^{eval}(E_\gamma) - \sigma^{\exp}(E_\gamma)| / \Delta\sigma^{\exp}(E_\gamma)}{\sum_{E_\gamma} \sigma^{eval}(E_\gamma)} \quad (9)$$

These parameters, listed in the Table 7 and shown in Fig. 7, have the meaning of comparison of the difference between the experimental and evaluated data with experimental uncertainties. Thus when $-1 \leq Q \leq 1$, the status of evaluated library was regarded as satisfactory (Y), in other case - unsatisfactory (N).

The detailed information for every element and library could be found in the Table 7, but the general conclusions about the status of evaluated discrete γ-ray production cross sections against experimental ones are following:

- the agreement within experimental uncertainties is reached for ^{6}Li, ^{9}Be, ^{10}B, C in FENDL-1 and ENDF/B6;
- for all elements heavier than F, the evaluated cross sections are presented as a sum of discrete transitions and continuous energy distributions. For all of these nuclei the evaluated data (including discrete intensities from continuous distributions) seriously underestimate the experimental cross sections. The differences usually exceed the experimental uncertainties by a few times. Thus it should be recommended to include available experimental information about discrete γ-rays production cross sections in evaluated data library;
- there do not exist evaluation of γ-ray yields for Ge, Sn, Cs.

8. Conclusions and Recommendations

The review of measurements on discrete γ-rays production cross sections at 14 MeV for practically important nuclei, the compilation of the cross sections and the most important parameters experiments have been done. The collected cross sections were critically analyzed and were corrected taking into account today reference standards, angular dependence of angular yield, interpolation to one incident neutron energy 14.5 MeV, omission of obviously erroneous data etc. The estimated γ-rays production cross-sections and its uncertainties have been finally calculated, weighting the individual experimental data. The comparison of estimated experimental results with the WRENDA request and evacuated data libraries FEDL-1, ENDF/B6 and BROND-2 results to the conclusions about present status of experimental and evaluated data on discrete photon production cross-sections.

Experimental data:

- the nuclei, for which discrete γ-rays production cross sections were not measured yet, and which could be regarded as a first candidates for experimental investigation: Zr, Sn, Cs, Ba, Ta, W;
- there are few measurements for separated isotopes;
- the nuclei, for which discrete γ-rays production cross sections were measured only in one experimental work, so these data have to be checked by other independent experiment(s): ^{6}Li, ^{52}Cr, ^{56}Fe, Ge, Nb, Mo, I;
- the nuclei, for which the accuracy of experimental discrete γ-ray production cross sections satisfy the practical requests: Li, C, Si, V;
- for other nuclei the measured total discrete production cross sections, as a rule, satisfy the requirements declared in WRENDA list, except ^{6}Li, Be, Ge, whereas the energy differential uncertainties do not satisfy the requests for F, Cl, K, Ca, Ge, Pb, Bi;
- the following γ-rays transitions and cross sections at 14.5 MeV energy could be recommended as a reference cross-sections for the tasks, in which the accuracy of 10% is acceptable: 4439 keV form C(n,n')^{12}C, 3004 keV and 2211 keV from Al(n,n')^{27}Al, 2211 keV from Al(n,n')^{27}Al, 847 keV from Fe(n,n')^{56}Fe.

Evaluated data libraries:

- there do not exist evaluation of γ-ray yields for Ge, Sn, Cs;
- elements for which evaluated γ-production cross sections are presented only as a discrete transitions: ^{6}Li, ^{7}Li, ^{9}Be, ^{10}B, ^{11}B, ^{12}C, ^{14}N, ^{16}O, ^{19}F;
- elements for which evaluated discrete γ-production cross sections agree with measured data within experimental uncertainties: ^{6}Li, ^{9}Be, ^{10}B, ^{12}C;
- for all elements heavier than F, the evaluated cross sections are presented as a sum of discrete transitions and continuous energy distributions. For all of these nuclei the evaluated data (including discrete intensities from continuous distributions) seriously underestimate the experimental cross sections. The differences usually exceed the experimental uncertainties by a few times. Thus it should be recommended to include available experimental information on discrete γ-rays production cross sections in evaluated data library.

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Explanations of the notations and symbols, used in the Tables.

Table 1 and 2.
Notations and symbols are self-explanatory.

Table 3. Compilation of measured and corrected discrete photon production cross sections.

- Column 1. Energy of discrete γ-rays in keV (two energies if corresponding transitions were not resolved).
- Column 2. Reaction(s), which produce this γ-rays.
- Column 3. Initial and final states (excitation energy in keV, spin and parity) ascribed to the γ-ray transition. The question mark denotes the case, when any parameter of the level is not known. The information about the speed of the γ-emission is also included. Prompt (p) means the transition is much faster than experimental time resolution (usually a few nanoseconds). In the case of delayed (d) γ-ray emission the corresponding half-life period is given.
- Column 4. Incident neutron energy at which the cross section have been measured.
- Column 5. Angle or range of angles at which the cross section have been measured.
- Column 6. The parameters of the sample: chemical/isotope composition, size in mm, weight in grams. Also are given the information whether the corrections were applied (+) or not (-) for attenuation of γ-rays flux (Att.) and multiple neutron scattering (MS) in the sample. The question mark denotes the case, when such information could not be derived from original work.
- Column 7. Type of detector.
- Column 8. Measured cross sections and uncertainty in mb. The data marked by asterisk are preliminary and could be still corrected by the authors of the experiment.
- Column 9. First author of publication.
- Column 10. Year of publication.
- Columns 11-13. Correction applied to original experimental data after analyses: renormalisation absolute value to new updated standard (Abs., column 11); correction for angular dependence of γ-rays yield (Ang., column 12, the question mark denotes the case, when information is not available); cross-section shift in mb due to interpolation of incident neutron energy to 14.5 MeV ($\Delta\sigma$, column 13).
- Column 14. The cross sections received from original experimental ones after application of corrections listed in columns 11 to 13. The data marked by "(s)" were skipped during the calculation of the averaged cross-section.

Table 4. The methods used for absolute normalization and correction for attenuation and multiple scattering in the sample by authors of reviewed experiments.

- Column 1. First author and publication year of original experimental work (the explicit reference could be found in Table 2).
- Column 2. Method of Absolute Normalization. When reference (n,xγ) reaction was used, the corresponding energy in keV of γ-ray and incident neutron energy E in MeV are given.
- Column 3. Reference cross section in mb used in original work.

- Column 4. Updated reference cross section in mb recommended in present work (the source of it is indicated in footnote of the Table 4).
- Column 5. The corrections were applied by authors of original experimental work for their data: Att. – correction for attenuation of γ-rays flux, MS - correction for multiple neutron scattering in the sample. "No Infor" means that such information could not be derived from available publications.

Table 5. Estimated experimental and evaluated discrete photon production cross sections at 14.5 MeV for elements from Li to F.

- Column 1. Reaction, which produce the γ-rays.
- Column 2. Energy of discrete γ-rays in keV.
- Columns 3-4. Experimental information: number of experimental works (N_{exp}), in which the specified transition have been measured; averaged cross section (σ) in mb, its absolute ($\Delta\sigma$) and relative uncertainty ($\Delta\sigma/\sigma$).
- Columns 5-6. FENDL-1 evaluated cross section in mb and factor of prediction quality, i.e. agreement with experimental results (Q), see formula 8 in the text.
- "NE" means that there is no evaluation for this element in the library.
- Columns 7-8. The same as columns 5-6, but for ENDF/B6.
- Columns 9-10. The same as columns 5-6, but for BROND-2.

Table 6. Estimated experimental and evaluated discrete photon production cross sections at 14.5 MeV for elements from Na to Bi.

- Column 1. Reaction, which produce the γ-rays.
- Column 2. Energy of discrete γ-rays in keV.
- Columns 3-4. Experimental information: number of experimental works (N), in which the specified transition have been measured; averaged cross section (σ) in mb, its absolute ($\Delta\sigma$) and relative uncertainty ($\Delta\sigma/\sigma$).
- Columns 5-6. FENDL-1 evaluated cross sections, which may consist of two components: the discrete (σ_d, column 5) and continues (σ_c, column 6) cross sections. Column 6 additionally has information about the file number (6 or 15) and type of continues part of γ-ray production cross section (S – smoothed, i.e. without any peaks, C – complex, i.e. the combination of peaks and smoothed distribution). In parenthesis - factor of prediction quality (Q), see formula 8 in the text. "NE" means that there is no evaluation for this element in this library; "NGE" - no γ-ray evaluation; "NDD" - no discrete γ-rays production cross-sections data.
- Columns 7-8. The same as columns 5-6, but for ENDF/B6.
- Columns 9-10. The same as columns 5-6, but for BROND-2.

Table 7. List of WRENDA requests, status of experimental and evaluated data for discrete γ-rays production cross sections

- Column 1. List number of element.
- Column 2. Element/isotope.

- Column 3. WRENDA request for uncertainty needed. In parenthesis – priority of request (1- is the highest priority).
- Columns 4-8. Experimental information.
  Number of measured γ-ray transitions (N_γ. column 4, "No Exp" means that there is no experimental data).
  Sum, i.e. total discrete γ-ray production cross section and its absolute uncertainty in mb ($\sigma\pm\Delta\sigma$, column 5)
  Relative uncertainty ($\Delta\sigma/\sigma$, column 6) for total discrete production.
  Relative uncertainty averaged over N_γ. transitions for this element ($\Delta S/S$, column 7), see formula 7 in the text; status of experimental data against WRENDA request (column 8, "Y" – yes, satisfied, "N" – no, "?" – questionable case).
- Columns 9-13. Information from FENDL-1 library.
  Number of γ-ray transitions (N_γ. column 9); sum, i.e. total discrete cross section in mb (σ, column 10); the quality of prediction of experimental total discrete production cross section (Q_{tot}, column 11, "NGE" means no γ-rays production cross section evaluation in this library, "NE" - no evaluation for this element at all in this library).
  The prediction quality for the energy-differential discrete production cross section (Q_{dif}, column 12), see formula 9 in the text. Status of evaluated data against experimental (column 13, "Y" – yes, satisfied, "N" – no, "?" – questionable case).
- Columns 14-18. The same as columns 9-13, but for ENDF/B6 library.
- Columns 19-23. The same as columns 9-13, but for BROND-2 library.

Table 1. List of WRENDA 93/94 requests, FENDL-1/E evaluations ("+" - means that this element is included in FENDL-1/E) and estimated experimental data uncertainties.

N	Element	WRENDA 93/94 Request (Priority)	FENDL-1/E	N	Element	WRENDA 93/94 Request (Priority)	FENDL-1/E
1	Li	15%(2)	+	19	Cr	10%(1)	+
2	Be	4-15%(2)	+	20	Mn	10%(1)	+
3	B		+	21	Fe	10%(1)	+
4	C	4-10%(2)	+	22	Co		+
5	N		+	23	Ni	10%(1)	+
6	O	4-10%(2)	+	24	Cu	10%(1)	+
7	F	15%(2)	+	25	Ge	10%(2)	
8	Na		+	26	Zr		+
9	Mg		+	27	Nb	10%(1)	+
10	Al		+	28	Mo	15%(1)	+
11	Si	5-10%(2)	+	29	Sn		+
12	P		+	30	I	10%(1)	
13	S		+	31	Cs	10%(2)	
14	Cl		+	32	Ba		+
15	K		+	33	Ta		+
16	Ca		+	34	W		+
17	Ti		+	35	Pb		+
18	V	15%(1)	+	36	Bi	10%(1)	+

Table 2. List of experiments used in present compilation (references for the Table 3).

Author	Year	Reference	EXFOR
Hlavac-2	1997	S. Hlavac et. al. To be published	
Hlavac-1	1997	S. Hlavac et. al. Nucl. Sci. and Eng. 1997, v. 125, p. 196	
Hongyu-2	1997	Hongyu Zhou et. al.. Proc. of Int. Conf. on Nucl. Data for Sci. and Tech., Trieste, May 1997, v. 1, p. 625	
Hongyu-1	1997	Hongyu Zhou et. al.. Nucl. Sci. and Eng., 1997, v. 125, p. 61	
Murata	1997	I. Murata et. al. Private communication, 1997	
Hlavac	1996	S. Hlavac et. al. Report INDC(NDS)-357, Vienna, 1996, p. 25	
Hitzenberger	1994	H. Hitzenberger et al. Proc.Int.Conf.on Nucl.Data for Sci. and Techn. (Gatlinburg, May 1994), v. 1, p. 367	13643
Hlavac	1994	S. Hlavac et. al. Report INDC(SLK)- 002, Vienna, 1994	
Hongyu	1994	Z. Hongyu et. al. Int. Conf on Nucl. Data (Gatlinburg, 1994), p. 166	
Lashuk	1994	A.I. Lashuk et. al.. Vopr. Atom. Nauki i Tech.., 1994, v.1, p.26	41186
Lychagin	1992	A.A. Lychagin, et. al. Report FEI-2281, Obninsk 1992	
Dickens	1991	J. K. Dickens et. al. Proc.Int.Conf.on Nucl.Data for Sci. and Techn. (Julich, 1991), p. 307	13500
Drosg	1991	M. Drosg, D. M. Drake et. al. Proc.Int.Conf.on Nucl.Data for Sci. and Techn. (Julich, 1991), p. 304	
Guoyong	1991	F. Guoying, Z. Hongyu et. al. Proc.Int.Conf.on Nucl.Data for Sci. and Tech. (Julich, 1991), p. 332	30991
Takayama	1991	T. Takayama, Y. Ohya et. al. Report JAERI-M 91-032	
Hongyu	1989	Z. Hongyu et. al. Chinese Journ. of Nucl. Physics, 1989, v. 11, p. 63	31420
Dickens	1988	J.K. Dickens and D. C. Larson. Proc.Int.Conf.on Nucl. Data for Sci. and Tech. (Mito, 1988), p. 213	
Hongyu	1988	Z. Hongyu et. al. Proc.Int.Conf. on Nucl.Data (Mito, 1988), p. 311	30927
Jinqiang	1988	Xiang Jinqiang et. al. Chin. Jour. of Nucl. Phys., 1988, v. 10, p. 284	32513
Murata	1988	I. Murata et. al. Int. Conf. on Nucl. Data for Sci. and Tech. (Mito, 1988), p. 275	22096
Yiming	1988	Y. Yiming, Z. Hongyu et. al. Report INDC(CRP)-011/GI, 1988	32610

Author	Year	Reference	EXFOR
Oblozinsky	1988	P. Oblozinsky et.al. Report INDC(CSR)-013/GM, Vienna, 1988. S. Hlavac et. al. Report INDC(CSR)-011/GI+M, Vienna, 1987	
Hongyu	1986	Zhou Hongyu et. al. Report INDC(CRP)-010/L, Vienna, 1986	30904
Bell	1983	Z.W. Bell, J.K. Dickens et. al. Nucl. Sci. and Eng., 1983, v. 84, p. 12	10684
Bezotosny	1980	V. M. Bezotosny et. al. "Neutron Physics", Kiev, 1980, v. 2, p. 21	40515 40340
Cecil	1979	F. E. Cecil et. al. Phys.Rev., 1979, v. C19, p. 2414	10834
Zong-Reng	1979	Zong-Reng et. al. Chinese Journal of Nucl. Physics, 1979, v. 1, p. 45	30594
Drake	1978	D. M. Drake et. al. Nucl. Sci. and Eng., 1978, v. 65, p. 49	10684
Hino	1978	Y. Hino et.al. J. Nucl. Sci. and Techn., 1978, v. 15, p. 85	
Yamamoto	1978	T. Yamamoto et. al. J.of Nucl.Sci.Tech., 1978, v. 15, p. 797	21304
Degtyarev	1977	A. L. P. Degtyrev et. al. "Neutron Physics", Mosc. 1977, v. 2, p. 57	40505
Bezotosny	1976	V. M. Bezotosny et. al. "Neutron Physics", Mosc. 1976, v.4, p.133	40516
Hino	1976	Y. Hino et. al. Report NEANDC(J)-44L, 1976, p. 62	20696
Prokopec	1976	G. A. Prokopec et. al. Proc. Conf. in Baku 1976, p. 50	40437
Prokopec	1976	G. A. Prokopec et. al. Sov. Journ. of Nucl.Phys., 1976, v. 23, p. 935	40447
Arthur	1975	E. D. Arthur et. al. Proc. Int. Conf., Washington, 1975, v. 2, p. 770	
Orphan	1975	V. J. Orphan et. al. Nucl. Sci. Eng., 1975, v. 57, p. 309	
Rogers	1975	V. C. Rogers et. al. Nucl. Sci. Eng., 1975, v. 58, p. 298	
Voss	1975	F. Voss et. al. Proc. Int. Conf., Washington, 1975, p. 916	20744
Grenier	1974	G. Grenier "Neutron Physics" Obninsk, 1974, v. 3, p. 215	21158
Korkalchuk	1974	V. Korkalchuk et. al. Sov Jour. of Nucl. Phys, 1974, v. 20, p. 1096	
Lachkar	1974	J. Lachkar et. al. Nucl. Sci. Eng., 1974, v. 55, p. 168	
Abbondano	1973	U. Abbondano et. al. J. of Nucl. Ener., 1973, v. 27, p. 227	20493
Breunlich	1972	W. Breunlich et. al. Nucl. Phys., 1972, v. A184, p. 253	21286
McKinney	1972	H. O. McKinney et. al.	13034
Feicht	1971	E. J. Feicht, H.Goebel. Zeit. fur Phys., 1971, v. 245, p. 13	20982
Martin	1971	T. C. Martin et.al. Report ORO-2791-32, 1971	13010
Morgan	1971	I. L. Morgan et.al. Report ORO-2791-32, 1971	12695
Nellis	1971	D. L. Nellis. Report ORO-2791-32, 1971	13001
Nyberg	1971	K. Nyberg-Ponnert et al. Physica Scripta, 1971, v. 4, p. 165	20245
Voss	1971	F. Voss et. al. Proc. Int. Conf., Knoxville, 1971, p. 218	20371
Nellis	1970	D. O. Nellis et.al. Phys. Rev., 1970, v. 1, p. 847	10158
Orphan	1970	V. J. Orphan et.al. Nucl. Sci. Eng., 1970, v. 42, p. 352	
Tucker	1970	W. E. Tucker et.al. Report ORO-2791-32, 1970	12696
Burimov	1969	E. M. Burimov et.al. Sov.J. Nucl. Phys.,1965, v. 9, p. 546	40229
Clayeux	1969	G. Clayeux and G. Grenier. Report CEA-R-3807, 1969	21677
Tucker	1969	W. E. Tucker, D. O. Nellis et. al. Report ORO-2791-31, 1969	
Joenson	1968	B. Joensson et.al. Ark.fur Fysik, 1969, v. 39, p. 295	20164
Maslov	1968	G. N. Maslov et.al. Atomnaya Energiya, 1968, v. 24, p. 573	40192
Engesser	1967	F. C. Engesser et.al. J.of Nucl. Ener., 1967, v. 21, p. 487	11531
Bezotosny	1966	V. M. Bezotosny et.al. Sov.J. Nucl. Phys.,1966, v. 3, p. 861	40777
Roturier	1966	T. Roturier. Copmtes Redus, 1966, v. 262, p. 1738	20599
Martin	1965	P. W. Martin et. al. J. of Nucl. Energy, 1965, v. 19, p. 447	21191
Western	1965	G. T. Western. Report WL-TR-64-140, 1965	12681
Stewart	1964	D. T. Stewart, P. W. Martin. Nucl.Phys., 1964, v. 60, p. 352	
Benveniste	1962	J. Benveniste et. al. Nuclear Physics, 1962, v. A38, p. 300	11165
Benveniste	1960	J. Benveniste et. al. Nuclear Physics, 1960, v. 19, p. 448	

Table 3. Compilation of measured and corrected discrete photon production cross sections (Comments: (s) - these data were skipped during the calculation of the averaged cross-section; * - these data are preliminary and could be still corrected by the authors).

Eγ, keV	Reaction	Transition Ui (Iiπ)→Uf(Ifπ), Speed	E, MeV	Angle, Degree	Sample Mat:Size (mm), Att/MS	Detect.	σ, mb	Author	Publ Year	Correction Abs	Ang	Δσ, mb	Corrected σ mb
1	2	3	4	5	6	7	8	9	10	11	12	13	14
					3-Lithium-6								
3562	^{6}Li(n,n')^{6}Li	3562(3$^+$)→0(1$^-$), p	14	0-180	^{6}Li:Ø70×Ø??, +/-	NaI(Tl)	1.4±0.5	Bezotosny	1976	1.0	1.0	-0.11	1.29±0.46
					3-Lithium-7								
478	^{7}Li(n,n')^{7}Li	478(1/2$^-$)→0(3/2$^-$), p	14	0-180	^{7}Li:Ø70×Ø??, +/-	NaI(Tl)	20±3	Bezotosny	1976	1.0	1.0	-2.8	(s) 17.2±2.6
			14.8	90	^{7}Li:Ø?×?, +/+	NaI(Tl)	97±7	Western	1965	1.0	1.12	1.7	110.3±7.8
			13.6	150	LiH:Ø360×Ø300×40, +/+	NaI(Tl)	108±12	Benveniste	1962	1.0		-5.0	
			13.7	140	LiH:Ø360×Ø300×40, +/+	NaI(Tl)	86±10	Benveniste	1962	1.0		-4.4	
			13.7	130	LiH:Ø360×Ø300×40, +/+	NaI(Tl)	86±10	Benveniste	1962	1.0		-4.4	
			13.8	120	LiH:Ø360×Ø300×40, +/+	NaI(Tl)	87±10	Benveniste	1962	1.0		-3.9	
			14.0	110	LiH:Ø360×Ø300×40, +/+	NaI(Tl)	82±10	Benveniste	1962	1.0		-2.8	
			14.1	100	LiH:Ø360×Ø300×40, +/+	NaI(Tl)	77±9	Benveniste	1962	1.0		-2.2	85.5±10
			14.2	90	LiH:Ø360×Ø300×40, +/+	NaI(Tl)	75±9	Benveniste	1962	1.0		-1.7	
			14.3	80	LiH:Ø360×Ø300×40, +/+	NaI(Tl)	78±9	Benveniste	1962	1.0		-1.1	
			14.4	70	LiH:Ø360×Ø300×40, +/+	NaI(Tl)	91±10	Benveniste	1962	1.0		-0.6	
			14.6	50	LiH:Ø360×Ø300×40, +/+	NaI(Tl)	99±11	Benveniste	1962	1.0		+0.6	
			14.7	40	LiH:Ø360×Ø300×40, +/+	NaI(Tl)	80±9	Benveniste	1962	1.0		+1.1	
			14.8	30	LiH:Ø360×Ø300×40, +/+	NaI(Tl)	115±13	Benveniste	1962	1.0		+1.7	
					4-Beryllium-9 (100%)								
478	^{9}Be(n,t)^{7}Li	478(1/2$^-$)→0(3/2$^-$), p	14	0-180	Ø60×Ø20, +/-	NaI(Tl)	2±.5	Bezotosny	1976	1.0	1.0	+1.0	3±0.5
			14.2	90	Ø44×6,Ø31×Ø25×32,+/+	NaI(Tl)	8.8±2.5	Drake	1978	1.0	?	+0.6	9.4±2.5
					5-Boron -nat (10 - 19.9%, 11 - 80.1%)								
2125	^{11}B(n,n')^{11}B	2125(1/2$^-$)→0(3/2$^-$), p	14.3	125	B:Ø18×58, 54g, +/+	HPGe	33.3±10.1	Dickens	1988	1.0	1.0	-2.0	31.3±10.1
			14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	33±4	Bezotosny	1976	1.0	1.0	-5.0	27.8±4.0
			14.2	0-180	B_4C:??, +/+	NaIpair	110±40	Maslov	1968	1.0	1.0	-2.4	108±40
3368	^{10}B(n,p)^{10}C	3368(2$^+$)→0(0$^+$), p	14.2	0-180	B_4C:??, +/+	NaIpair	16±8	Maslov	1968	1.0	1.0	-0.1	15.9±8
4445	^{11}B(n,n')^{11}B	4445(5/2$^-$)→0(3/2$^-$), p	14.3	125	B:Ø18×58, 54g, +/+	HPGe	89±14	Dickens	1988	1.0	1.0	-2.5	86.5±14
			14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	120±14	Bezotosny	1976	1.0	1.0	-6.7	114±14
			14.2	0-180	B_4C:??, +/+	NaIpair	126±40	Maslov	1968	1.0	1.0	-3.2	123±40
5021	^{11}B(n,n')^{11}B	5021(3/2$^-$)→0(3/2$^-$), p	14.3	125	B:Ø18×58, 54g, +/+	HPGe	8.6±5.5	Dickens	1988	1.0	1.0	-1.1	7.5±5.5
			14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	27±4	Bezotosny	1976	1.0	1.0	-2.3	24.7±4.0
			14.2	0-180	B_4C:??,+/+	NaIpair	28±10	Maslov	1968	1.0	1.0	-0.7	27.3±10
					5-Boron-10								
414	^{10}B(n,n')^{10}B	2154(1$^+$)→1740(0$^+$), p	14.3	125	^{10}B:Ø18×58, +/+	HPGe	4.1±0.8*	Dickens	1988	1.0	1.0	-0.15	4.0±0.8*
			14.8	55	^{10}B:Ø25×51,Ø20×40, +/+	NaI, Ge	2.6±0.5	Nellis	1970	1.0	1.0	+0.2	2.8±0.5
478	^{10}B(n,α)^{7}Li	478(1/2$^-$)→0(3/2$^-$), p	14.0	0-180	^{10}B:Ø70×Ø??, +/-	NaI(Tl)	41±5	Bezotosny	1976	1.0	1.0	+1.3	42.3±5
			14.8	55	^{10}B:Ø25×51,Ø20×40, +/+	NaI, Ge	34±3	Nellis	1970	1.0	1.0	+0.1	34.1±3
718	^{10}B(n,n')^{10}B	718(1$^+$)→0(0$^+$), p	14.3	125	^{10}B:Ø18×58, +/+	HPGe	28.3±2.2*	Dickens	1988	1.0	1.0	-0.6	27.7±2.2*
			14.0	0-180	^{10}B:Ø70×Ø??, +/-	NaI(Tl)	36±5	Bezotosny	1976	1.0	1.0	-1.6	34.4±5
			14.8	55	^{10}B:Ø25×51,Ø20×40, +/+	NaI, Ge	31±2	Nellis	1970	1.0	1.0	+0.9	31.9±2
1022	^{10}B(n,n')^{10}B	1740(0$^+$)→718(0$^+$), p	14.3	125	^{10}B:Ø18×58, +/+	HPGe	3.1±0.9*	Dickens	1988	1.0	1.0	-0.18	2.9±0.9*

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
			14.0	0-180	^{10}B:Ø70×Ø??, +/-	NaI(Tl)	12±2	Bezotosny	1976	1.0	1.0	-0.5	11.5±2
			14.8	55	^{10}B:Ø25×51,Ø20×40, +/+	NaI, Ge	9±.5	Nellis	1970	1.0	1.0	+0.3	9.3±.5
3368	^{10}B(n,p)^{10}C	3368(2$^+$)→0(0$^+$), p	14.0	0-180	^{10}B:Ø70×Ø??, +/-	NaI(Tl)	28±4	Bezotosny	1976	1.0	1.0	-1.2	26.8±4
			14.8	55	^{10}B:Ø25×51,Ø20×40, +/+	NaI, Ge	21±1	Nellis	1970	1.0	1.0	+0.7	21.7±1
5-Boron-11													
478	^{11}B(n,nα)^{7}Li	478(1/2$^-$)→0(3/2$^-$), p	14.3	125	B:Ø18×58, 54g, +/+	HPGe	21.5±4.2	Dickens	1988	1.0	1.0	+5.6	27.1±4.2
2125	^{11}B(n,n')^{11}B	2125(1/2$^-$)→0(3/2$^-$), p	14.3	125	B:Ø18×58, 54g, +/+	HPGe	41.6±12.7	Dickens	1988	1.0	1.0	-2.5	39.1±12.7
			14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	41±5	Bezotosny	1976	1.0	1.0	-6.3	34.7±5
4445	^{11}B(n,n')^{11}B	4445(5/2$^-$)→0(3/2$^-$), p	14.3	125	B:Ø18×58, 54g, +/+	HPGe	111±18	Dickens	1988	1.0	1.0	-3.3	108±18
			14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	150±17	Bezotosny	1976	1.0	1.0	-8.4	142±17
5021	^{11}B(n,n')^{11}B	5021(3/2$^-$)→0(3/2$^-$), p	14.3	125	B:Ø18×58, 54g, +/+	HPGe	10.7±6.9	Dickens	1988	1.0	1.0	-1.3	9.4±6.9
			14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	34±5	Bezotosny	1976	1.0	1.0	-3.2	30.8±5
6793	^{11}B(n,n')^{11}B	6793(3/2$^+$)→0(3/2$^-$), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	65±5	Bezotosny	1976	1.0	1.0	-0.9	64.9±5
6-Carbon (12 - 98.9%, 13 - 1.1%)													
4439	^{12}C(n,n')^{12}C	4439(2$^+$)→0(0$^+$), p	15.4	90	Ø190×Ø110×??, +/+	Ge(Li)	170±20	Lashuk	1994	0.85	1.07	+33.3	188±18
			14.9	90	C:Ø28.0×35.4, 43g, +/+	Ge(Li)	153±19	Hongyu	1989	1.0	1.07	+15.0	179±20
			14.1	30-150	Ø30×Ø26×70, +/+	Ge	180±7	Murata	1988	?	1.0	-14.8	165±7
			14.9	90	C:Ø30×30, +/+	Ge(Li)	159±10	Hongyu	1986	1.0	1.07	+15.0	185±11
			14.9	93	No Information	NaI(Tl)	131±23	Zong-Ren	1979	1.0	1.07	+15.0	155±25
			14.2	45-130	Ø44×6,Ø31×Ø25×32,+/+	NaI(Tl)	228±30	Drake	1978	1.0	1.0	-11.1	217±30
			14.2	55	C:Ø30×40, +/+	Ge(Li)	156±28	Hino	1976	1.0	1.0	-11.1	145±28
			14	0-180	Ø60×Ø20, +/-	NaI(Tl)	255±26	Bezotosny	1976	1.0	1.0	-18.5	237±26
			14.2	125	C:Ø483×Ø279×25, +/+	Ge(Li)	168±20	Rogers	1975	1.0	1.0	-11.1	157±20
			14.2	45-125	No Information, +/+	NaI(Tl)	219±29	Arthur	1975	1.0	1.0	-11.1	208±29
			14.8	90	No Information	Ge(Li)	152±20	Martin	1971	1.0	1.07	+11.1	174±21
			13.0	30-140	C:Ø25.4×50.8, +/+	Antico	440±80	Morgan	1971	1.0	1.0	-55.5	(s) 384±80
			14.8	30-140	C:Ø25.4×50.8, +/+	Antico	225±30	Morgan	1971	1.0	1.0	+11.1	236±30
			14.1	90	C:Ø50×30, +/+	Ge(Li)	121±20	Clayeux	1969	1.0	1.07	-14.8	115±21
			14.2	0-180	Shell ??, +/+	NaIpair	163±30	Maslov	1968	1.0	1.0	-11.1	152±30
			14.7	90	C:Ø38.1×76.2, +/+	NaI(Tl)	165±17	Engesser	1967	1.0	1.07	+7.2	184±18
			14	No Inf	C:Ø60×30, +/+	NaI(Tl)	133±17	Bezotosny	1966	1.0	?	-18.5	115±17
			14.1	30-160	C:Ø??×20, +/+	NaI(Tl)	232±18	Stewart	1964	1.0	1.0	-14.8	217±18
			=14	30-150	C:Ø165×Ø115×25, +/+	NaI	249±28	Benveniste	1960	1.0	1.0	-18.5	230±28
7-Nitrogen (14 - 99.63%, 15 - 0.37%)													
727	^{14}N(n,n')^{14}N	5833(3$^-$)→5106(1$^+$), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	16±2	Bezotosny	1976	1.0	1.0	+0.3	16.3±2
			15.0	80	N_2:Ø109×256, +/+	Ge(Li)	20.1±3.8	Nyberg	1971	0.91	?	+2.0	20.2±3.5
			14.8	90	Be_3N_2:Ø38.1×50.8, +/+	Anticoi	17±3	Morgan	1971	1.0	?	+1.2	18.2±3
			14.8	55	Be_3N_2:Ø92.5×29.5, +/?	NaI(Tl)	29±3.5	Tucker	1970	1.0	1.0	+1.2	30.2±3.5
1632	^{14}N(n,n')^{14}N	3945(1$^+$)→2313(0$^+$), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	18±2	Bezotosny	1976	1.0	1.0	-2.2	15.8±2
			15.0	80	N_2:Ø109×256, +/+	Ge(Li)	28.9±5	Nyberg	1971	0.91	1.09	+2.1	30.7±5.0
			14.8	90	Be_3N_2:Ø38.1×50.8, +/+	Anticoi	17±3	Morgan	1971	1.0	1.10	+1.2	20.0±3.3
			14.8	55	Be_3N_2:Ø92.5×29.5, +/?	NaI(Tl)	19±2	Tucker	1970	1.0	1.0	+1.2	20.2±2
			14.1	90	$C_3N_6H_6$:Ø??×??, +/+	Ge(Li)	15±3	Clayeux	1969	1.0	1.10	-1.8	14.7±3.3
			14.7	90	$C_6N_6H_3$:Ø38.1×76.2, +/+	NaI(Tl)	28±9	Engesser	1967	1.0	1.10	+0.8	31.6±10
2125	^{14}N(n,α)^{11}B	2125(1/2$^-$)→0 (p)	14.8	55	Be_3N_2:Ø92.5×29.5, +/?	NaI(Tl)	29.5±3.5	Tucker	1970	1.0	1.0	+0.4	30.4±3
			14.8	90	Be_3N_2:Ø38.1×50.8, +/+	Anticoi	15±3	Morgan	1971	1.0	?	+0.4	15.4±3
			14.7	90	Ø38.1×76.2, +/+	NaI(Tl)	18±6	Engesser	1967	1.0	?	+0.3	18.3±6

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
2313	$^{14}N(n,n')^{14}N$	2313(0⁺)→0(1⁺), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	52±5	Bezotosny	1976	1.0	1.0	-3.0	49.0±5
			14.7	125	N_2:Ø483×Ø279×50, +/+	Ge(Li)	47±6	Rogers	1975	1.0	1.0	+1.3	48.3±6
			15.0	80	N_2:Ø109×256, +/+	Ge(Li)	30.2±6.3	Nyberg	1971	0.91	?	+3.2	30.7±5.7
			14.8	90	Be_3N_2:Ø38.1×50.8, +/+	Anticoi	34±7	Morgan	1971	1.0	?	+1.9	35.9±7
			14.8	55	Be_3N_2:Ø92.5×29.5, +/?	NaI(Tl)	39±5	Tucker	1970	1.0	1.0	+1.9	40.9±5
			14.1	90	$C_3N_6H_6$:Ø??×??, +/+	Ge(Li)	31±6	Clayeux	1969	1.0	?	-2.4	28.6±6
			14.7	90	$C_6N_6H_3$:Ø38.1×76.2, +/+	NaI(Tl)	59±11	Engesser	1967	1.0	?	+1.3	60.3±11
			14.1		N_2H_4 Ø30×50, 34g, +/-	NaI(Tl)	23±3	Roturier	1966	1.0	?	-2.4	20.6±3
3684	$^{14}N(n,d)^{13}C$	3684(3/2⁻)→0(1/2⁻), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	25±3	Bezotosny	1976	1.0	1.0	+1.0	26.0±3
			14.7	125	N_2:Ø483×Ø279×50, +/+	Ge(Li)	33±5	Rogers	1975	1.0	1.0	+0.4	33.4±5
			15.0	80	N_2:Ø109×256, +/+	Ge(Li)	25.1±3.8	Nyberg	1971	0.91	?	+1.1	23.9±3.5
			14.8	90	Be_3N_2:Ø38.1×50.8, +/+	Anticoi	25±5	Morgan	1971	1.0	?	+0.7	25.7±5
			14.8	55	Be_3N_2:Ø92.5×29.5, +/?	NaI(Tl)	38±5	Tucker	1970	1.0	1.0	+0.7	38.7±5
			14.1	90	$C_3N_6H_6$:Ø??×??, +/+	Ge(Li)	14±4	Clayeux	1969	1.0	?	+0.8	14.8±4
			14.7	90	$C_6N_6H_3$:Ø38.1×76.2, +/+	NaI(Tl)	34±11	Engesser	1967	1.0	?	+0.4	34.4±11
4445	$^{14}N(n,\alpha)^{11}B$	4445(5/2⁻)→0(3/2⁻), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	57±7	Bezotosny	1976	1.0	1.0	+2.9	59.9±7
+4439	$^{14}N(n,t)^{12}C$	4439(2⁺)→0(0⁺), p	14.7	125	N_2:Ø483×Ø279×50, +/+	Ge(Li)	37±6	Rogers	1975	1.0	1.0	-0.6	36.4±6
			15.0	80	N_2:Ø109×256, +/+	Ge(Li)	45.2±7.5	Nyberg	1971	0.91	?	-1.5	39.6±6.8
			14.8	90	Be_3N_2:Ø38.1×50.8, +/+	Anticoi	37±7	Morgan	1971	1.0	?	-0.9	36.1±7
			14.8	55	Be_3N_2:Ø92.5×29.5, +/?	NaI(Tl)	64±8	Tucker	1970	1.0	1.0	-0.9	63.1±8
			14.1	90	$C_3N_6H_6$:Ø??×??, +/+	Ge(Li)	78±28	Clayeux	1969	1.0	?	+2.3	80.3±28
			14.2	0-180	Liquid N_2: Shell ??, +/+	NaIpair	65±20	Maslov	1968	1.0	1.0	+1.8	66.8±20
			14.7	90	$C_6N_6H_3$:Ø38.1×76.2, +/+	NaI(Tl)	63±13	Engesser	1967	1.0	?	-0.6	62.4±13
5106	$^{14}N(n,n')^{14}N$	5106(2⁻)→0(1⁺), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	47±6	Bezotosny	1976	1.0	1.0	-1.3	45.7±6
			15.0	80	N_2:Ø109×256, +/+	Ge(Li)	33.9±5	Nyberg	1971	0.91	?	+2.4	33.2±4.6
			14.8	90	Be_3N_2:Ø38.1×50.8, +/+	Anticoi	23±5	Morgan	1971	1.0	?	+1.5	24.5±5
			14.8	55	Be_3N_2:Ø92.5×29.5, +/?	NaI(Tl)	54±6	Tucker	1970	1.0	1.0	+1.5	55.5±6
			14.1	90	$C_3N_6H_6$:Ø??×??, +/+	Ge(Li)	44±9	Clayeux	1969	1.0	?	-1.0	43.0±9
			14.7	90	$C_6N_6H_3$:Ø38.1×76.2, +/+	NaI(Tl)	54±18	Engesser	1967	1.0	?	+1.0	55.0±18
6743	$^{14}N(n,\alpha)^{11}B$	6743(7/2⁻)→0(3/2⁻), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	14±5	Bezotosny	1976	1.0	1.0	-0.0	14.0±5
			15.0	80	N_2:Ø109×256, +/+	Ge(Li)	12.6±2.5	Nyberg	1971	0.91	?	+0.1	11.6±2.3
7029	$^{14}N(n,n')^{14}N$	7029(2⁺)→0(1⁺), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	35±5	Bezotosny	1976	1.0	1.0	+0.2	35.2±5
			14.7	125	N_2:Ø483×Ø279×50, +/+	Ge(Li)	26±5	Rogers	1975	1.0	1.0	-0.1	25.9±5
			15.0	80	N_2:Ø109×256, +/+	Ge(Li)	42.7±6.3	Nyberg	1971	0.91	?	-0.2	38.6±5.7
			14.8	90	Be_3N_2:Ø38.1×50.8, +/+	Anticoi	11±2	Morgan	1971	1.0	?	-0.1	10.9±2
			14.8	55	Be_3N_2:Ø92.5×29.5, +/?	NaI(Tl)	30±4	Tucker	1970	1.0	1.0	-0.1	29.9±4
			14.7	90	$C_6N_6H_3$:Ø38.1×76.2, +/+	NaI(Tl)	60±20	Engesser	1967	1.0	?	-0.1	59.9±20
8-Oxigen (16 - 99.76%, 17 - 0.04%)													
987	$^{16}O(n,n')^{16}O$	7117→6130(3⁻), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	5.5±2.5	Bezotosny	1976	1.0	1.0	0.0	5.5±2.5
			14.7	90	D_2O:Ø38.1×76.2, +/+	NaI(Tl)	6.3±1.2	Engesser	1967	1.0	?	0.0	6.3±1.2
1755	$^{16}O(n,n')^{16}O$	8872(2⁻)→7117(1⁻), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	9.6±2	Bezotosny	1976	1.0	1.0	+0.5	10.1±2
			14.8	55	BeO:Ø88×51, +/?	NaI(Tl)	4.9±0.6	Tucker	1969	1.0	1.0	+0.5	5.4±0.6
			14.3	125	D_2O:Ø508Ø254×57, +/+	Ge(Li)	5±3.8	Orphan	1970	1.0	1.0	+0.2	5.2±3.8
			14.7	90	D_2O:Ø38.1×76.2, +/+	NaI(Tl)	8.8±2.5	Engesser	1967	1.0	?	+0.4	9.2±2.5
1955	$^{16}O(n,n')^{16}O$	8872(2⁻)→6917(2⁺), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	11.5±2	Bezotosny	1976	1.0	1.0	+0.2	11.7±2
			14.8	55	BeO:Ø88×51, +/?	NaI(Tl)	3.2±0.4	Tucker	1969	1.0	1.0	+0.2	3.4±0.4
2742	$^{16}O(n,n')^{16}O$	8872(2⁻)→6130(3⁻), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	40±5	Bezotosny	1976	1.0	1.0	+3.5	43.5±5
			15.0	80	H_2O:Ø160×85, +/+	Ge(Li)	45.2±7.5	Nyberg	1971	0.91	?	+6.1	47.2±6.8

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
			14.8	90	BeO:Ø25.4×50.8, +/+	Antico	33±7	Morgan	1971	1.0	1.0	+3.6	36.6±7
			14.1	90	H$_2$O:Ø??×?? , +/+	Ge(Li)	28±6	Clayeux	1969	1.0	?	+2.8	30.8±6
			14.8	55	BeO:Ø88×51, +/?	NaI(Tl)	27±3	Tucker	1969	1.0	1.0	+3.6	30.6±3
			14.0		Ø60×30, +/+	NaI(Tl)	142±25	Bezotosny	1966	1.0	?	+3.5	(s) 145.5±25
3089	^{16}O(n,α)^{13}C	3089(1/2$^+$)→0(1/2$^-$), p	14.7	125	CrO$_3$:Ø46×60, 147g, +/+	HPGe	3.1±0.6	Hlavac	1994	1.0	1.0	+0.7	(s) 3.8±0.6
			14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	24±4	Bezotosny	1976	1.0	1.0	-1.4	22.6±4
			14.3	125	D$_2$O:Ø508Ø254×57, +/+	Ge(Li)	21±16	Orphan	1970	1.0	1.0	-0.6	20.4±16
			14.8	55	BeO:Ø88×51, +/?	NaI(Tl)	20±2.4	Tucker	1969	1.0	1.0	+1.0	21.0±2.4
			14.2	0-180	H$_2$O, +/+	NaIpair	48±25	Maslov	1968	1.0	1.0	-0.8	47.2±25
			14.7	90	D$_2$O:Ø38.1×76.2, +/+	NaI(Tl)	20±4	Engesser	1967	1.0	?	+0.7	20.7±4
3684	^{16}O(n,α)^{13}C	3684(3/2$^-$)→0(1/2$^-$), p	14.7	125	CrO$_3$:Ø46×60, 147g, +/+	HPGe	54±5	Hlavac	1994	1.0	1.0	-3.0	51.0±5
			14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	69±8	Bezotosny	1976	1.0	1.0	-4.8	64.4±8
			15.0	80	H$_2$O:Ø160×85, +/+	Ge(Li)	42.7±6.3	Nyberg	1971	0.91	?	-7.6	31.3±5.7
			14.8	90	BeO:Ø25.4×50.8, +/+	Antico	53±11	Morgan	1971	1.0	?	-4.6	48.4±11
			14.3	125	D$_2$O:Ø508Ø254×57, +/+	Ge(Li)	41±21	Orphan	1970	1.0	1.0	-1.9	39.1±21
			14.1	90	H$_2$O:Ø??×?? , +/+	Ge(Li)	38±8	Clayeux	1969	1.0	?	-3.8	34.2±8
			14.8	55	BeO:Ø88×51, ?/?	NaI(Tl)	84±10	Tucker	1969	1.0	1.0	-4.6	79.4±10
			14.7	90	D$_2$O:Ø38.1×76.2, +/+	NaI(Tl)	69±14	Engesser	1967	1.0	?	-3.0	66.0±14
3854	^{16}O(n,α)^{13}C	3854(5/2$^+$)→0(1/2$^-$), p	14.7	125	CrO$_3$:Ø46×60, 147g, +/+	HPGe	24±2	Hlavac	1994	1.0	1.0	+4.6	28.6±2
			14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	30±3.5	Bezotosny	1976	1.0	1.0	-13.4	16.6±3.5
			14.8	125	H$_2$O:Ø30×40, +/+	Ge(Li)	60±44	Yamamoto	1978	1.0	1.0	+6.9	66.9±44
			15.0	80	H$_2$O:Ø160×85, +/+	Ge(Li)	33.9±5.0	Nyberg	1971	0.91	?	+11.5	42.3±4.5
			14.8	90	BeO:Ø25.4×50.8, +/+	Antico	33±7	Morgan	1971	1.0	?	+6.9	39.6±7
			14.1	125	D$_2$O:Ø508Ø254×57, +/+	Ge(Li)	18±9	Orphan	1970	1.0	1.0	-10.7	(s) 7.3±9
			14.1	90	H$_2$O:Ø??×?? , +/+	Ge(Li)	30±6	Clayeux	1969	1.0	?	-10.7	19.3±6
			14.2	0-180	H$_2$O:Shell ?? , +/+	NaIpair	85±30	Maslov	1968	1.0	1.0	-8.0	87.0±30
			14.7	90	D$_2$O:Ø38.1×76.2, +/+	NaI(Tl)	32±6	Engesser	1967	1.0	?	+4.6	36.6±6
4439	^{16}O(n,n'α)^{12}C	4439(2$^+$)→0(0$^+$), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	5±2.5	Bezotosny	1976	1.0	1.0	+13.1	18.1±2.5
			14.3	125	D$_2$O:Ø508Ø254×57, +/+	Ge(Li)	22±22	Orphan	1970	1.0	1.0	+5.2	27.2±22
			14.8	90	BeO:Ø25.4×50.8, +/+	Antico	18±4	Morgan	1971	1.0	?	-8.3	9.7±4
			14.8	55	BeO:Ø88×51, +/?	NaI(Tl)	5.8±0.7	Tucker	1969	1.0	1.0	-8.3	(s) 0.0±0.7
			14.7	90	D$_2$O:Ø38.1×76.2, +/+	NaI(Tl)	19±6	Engesser	1967	1.0	?	-5.5	14.5±6
6130	^{16}O(n,n')^{16}O	6130(3$^-$)→0(0$^+$), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	160±16	Bezotosny	1976	1.0	1.0	+5.2	165.2±16
			14.8	125	H$_2$O:Ø30×40, +/+	Ge(Li)	137±40	Yamamoto	1978	1.0	1.0	+10.2	147.2±40
			14.8	90	BeO:Ø25.4×50.8, +/+	Antico	116±23	Morgan	1971	1.0	1.03	+10.2	129.7±23
			15.0	80	H$_2$O:Ø160×85, +/+	Ge(Li)	145±21	Nyberg	1971	0.91	1.03	+17.0	153±19
			14.1	125	D$_2$O:Ø508Ø254×57, +/+	Ge(Li)	84±17	Orphan	1970	1.0	1.0	+4.1	88.1±17
			14.6	0-180	No information, +/+	NaI(Tl)	179±22	Burimov	1969	0.90	1.0	+7.7	169±15
			14.1	90	H$_2$O:Ø??×?? , +/+	Ge(Li)	140±25	Clayeux	1969	1.0	1.03	+4.1	149±25
			14.8	55	BeO:Ø88×51, ?/?	NaI(Tl)	97±12	Tucker	1969	1.0	1.0	+10.2	107.2±12
6130	^{16}O(n,p)^{16}N(β)^{16}O	6130(3$^-$)→0(2$^-$), 7s											
6130	^{16}O(n,n'+pβ)^{16}O	6130(3$^-$)→0(0$^+$), p+d	14.7	90	D$_2$O:Ø38.1×76.2, +/+	NaI(Tl)	153±15	Engesser	1967	1.0	1.03	+5.5	163.1±15
			14.2	0-180	H$_2$O:Shell ?? , +/+	NaIpair	142±30	Maslov	1968	1.0	1.0	+2.0	144.0±30
			14	0-180	Ø60×30, +/+	NaI(Tl)	260±42	Bezotosny	1966	1.0	1.0	+3.3	263.3±42
6917	^{16}O(n,n')^{16}O	6917(2$^+$)→0(0$^+$), p	14.0	0-180	Ø70×Ø??, +/-	NaI(Tl)	57±7	Bezotosny	1976	1.0	1.0	-4.1	52.9±7
			14.3	125	D$_2$O:Ø508Ø254×57, +/+	Ge(Li)	35±11	Orphan	1970	1.0	1.0	-1.6	33.4±11
			15.0	80	H$_2$O:Ø160×85, +/+	Ge(Li)	50.3±7.5	Nyberg	1971	0.91	1.02	+4.1	50.8±7.0
			14.8	30-140	BeO:Ø25.4×50.8, +/+	Antico	33±7	Morgan	1971	1.0	1.0	+2.4	35.4±7

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
			14.1	90	H_2O:∅??×?? , +/+	Ge(Li)	30±6	Clayeux	1969	1.0	1.02	-3.2	27.4±6
			14.7	90	D_2O:∅38.1×76.2, +/+	NaI(Tl)	48±11	Engesser	1967	1.0	1.02	+1.6	50.6±11
7117	$^{16}O(n,n')^{16}O$	$7117(1^-)\rightarrow0(0^+)$, p	14.0	0-180	∅70×∅??, +/-	NaI(Tl)	57±7	Bezotosny	1976	1.0	1.0	+7.6	64.6±7
			14.1	125	D_2O:∅508∅254×57, +/+	Ge(Li)	33±10	Orphan	1970	1.0	1.0	+3.2	36.2±10
			15.0	80	H_2O:∅160×85, +/+	Ge(Li)	56.5±8.8	Nyberg	1971	0.91	?	-4.3	51.4±8.0
			14.8	90	BeO:∅25.4×50.8, +/+	Antico	25±5	Morgan	1971	1.0	?	-2.6	22.4±5
			14.1	90	H_2O:∅??×??, +/+	Ge(Li)	47±9	Clayeux	1969	1.0	?	+3.2	50.2±9
			14.7	90	D_2O:∅38.1×76.2, +/+	NaI(Tl)	63±13	Engesser	1967	1.0	?	-1.7	61.3±13
			14.1		H_2O: 36g, +/?	NaI(Tl)	37±11	Roturier	1966	1.0	?	+3.2	40.2±11
9-Fluorine (19 - 100%)													
110	$^{19}F(n,n')^{19}F$	$110\rightarrow0(1/2^+)$, p	14.9	93	No Information, +/+	NaI(Tl)	172±50	Zong-Ren	1979	1.0	?	+2.0	174±50
197	$^{19}F(n,n')^{19}F$	$197(5/2^+)\rightarrow0(1/2^+)$, 89ns	14.9	55-140	No Information, +/+	Ge(Li)	137±9	Hongyu	1994	1.0	1.0	+4.2	141.2±9
			14.9	93	No Information, +/+	NaI(Tl)	152±13	Zong-Ren	1979	1.0	?	+4.2	156.2±13
1236	$^{19}F(n,n')^{19}F$	$1346(5/2^+)\rightarrow110(1/2^+)$, p	16.2	55	CF_2:∅85×10, +/+	Ge(Li)	15±2	Prokopec	1976	1.15	1.0	+4.6	21.9±2.3
1357	$^{19}F(n,n')^{19}F$	$1554(3/2^+)\rightarrow197(5/2^+)$, p	14.9	93	No Information, +/+	NaI(Tl)	31±5	Zong-Ren	1979	1.0	?	+1.8	32.8±5
			16.2	55	CF_2:∅85×10, +/+	Ge(Li)	30±3	Prokopec	1976	1.15	1.0	+7.7	42.2±3.5
1982	$^{19}F(n,d)^{18}O$	$1982(2^+)\rightarrow0(0^+)$, p	14.9	93	No Information, +/+	NaI(Tl)	41±6	Zong-Ren	1979	1.0	?	-4.0	36.0±6
			16.2	55	CF_2:∅85×10, +/+	Ge(Li)	42±3	Prokopec	1974	1.15	1.0	-17.0	31.3±3.5
2583	$^{19}F(n,n')^{19}F$	$2780(9/2^+)\rightarrow197(5/2^+)$, p	14.2	0-180	CF_2:?? , +/+	NaIpair	49±25	Maslov	1968	1.0	1.0	-0.5	48.5±25
4181	$^{19}F(n,n')^{19}F$	$4378(7/2^+)\rightarrow197(5/2^+)$, p	14.2	0-180	CF_2:?? , +/+	NaIpair	35±25	Maslov	1968	1.0	1.0	-1.0	34.0±25
11-Sodium (23 -100%)													
440	$^{23}Na(n,n')^{23}Na$	$440(5/2^+)\rightarrow0(3/2^+)$, p	14.8	125	NaCl:∅30×40, +/+	Ge(Li)	596±72	Yamamoto	1978	1.0	1.0	+11.6	608±72
			14.6	45-135	Na:∅100×∅??, +/-	Ge(Li)	332±35	Degtyarev	1977	1.0	1.0	+3.9	336±35
			14.2	30-150	Na:∅60×12, +/-	NaI(Tl)	440±37	Abbondano	1973	1.0	1.0	-11.6	428±37
			14.7	90	Na:∅38.1×76.2, +/+	NaI(Tl)	496±50	Engesser	1967	1.0	0.98	+7.7	494±49
			14.1	30-90	No information, +/+	NaI(Tl)	436±56	Martin	1965	1.0	1.0	-15.4	421±56
627	$^{23}Na(n,n')^{23}Na$	$2704(9/2^+)\rightarrow2076(7/2^+)$, p	14.7	125	$Na_4P_2O_7$∅44×70,119g,+/+	HPGe	26±5	Hlavac-2	1997	1.0	1.0	+0.4	26.4±5
			14.6	45-135	Na:∅100×∅??, +/-	Ge(Li)	18.5±2	Degtyarev	1977	1.0	1.0	+0.2	18.7±2
656	$^{23}Na(n,\alpha)^{20}F$	$656(3^+)\rightarrow0(2^+)$p	14.7	125	$Na_4P_2O_7$∅44×70,119g,+/+	HPGe	45±6	Hlavac-2	1997	1.0	1.0	+1.0	46.0±6
			14.6	45-135	Na:∅100×∅??, +/-	Ge(Li)	43.2±5	Degtyarev	1977	1.0	1.0	+0.5	43.7±5
627 +656	$^{23}Na(n,n')^{23}Na$ + $^{23}Na(n,\alpha)^{20}F$	$2704(9/2^+)\rightarrow2076(7/2^+)$, p	14.7	125	$Na_4P_2O_7$∅44×70,119g,+/+	HPGe	71±8	Hlavac-2	1997	1.0	1.0	+1.4	72.4±8
			14.6	45-135	Na:∅100×∅??, +/-	Ge(Li)	61.4±5.4	Degtyarev	1977	1.0	1.0	+0.7	62.1±5.4
			14.2	30-150	Na:∅60×12, +/-	NaI(Tl)	64±12	Abbondano	1973	1.0	1.0	-2.1	64±12
			14.7	90	Na:∅38.1×76.2, +/+	NaI(Tl)	80±16	Engesser	1967	1.0	0.90	+1.4	73.4±14
823	$^{23}Na(n,\alpha)^{20}F$	$823(4^+)\rightarrow0(2^+)$, p	14.7	125	$Na_4P_2O_7$∅44×70,119g,+/+	HPGe	13±2	Hlavac-2	1997	1.0	1.0	+1.4	13±2
			14.6	45-135	Na:∅100×∅??, +/-	Ge(Li)	15±2	Degtyarev	1977	1.0	1.0	+0.7	15±2
			14.7	90	Na:∅38.1×76.2, +/+	NaI(Tl)	23±3	Engesser	1967	1.0	?	+1.4	23±3
1275	$^{23}Na(n,d)^{22}Ne$	$1275(2^+)\rightarrow0(0^+)$, p	14.7	125	$Na_4P_2O_7$∅44×70,119g,+/+	HPGe	194±14	Hlavac-2	1997	1.0	1.0	+9.4	194±14
			14.8	125	NaCl:∅30×40, +/+	Ge(Li)	175±29	Yamamoto	1978	1.0	1.0	+9.4	175±29
			14.6	45-135	Na:∅100×∅??, +/-	Ge(Li)	141±15	Degtyarev	1977	1.0	1.0	+3.1	141±15
			14.2	30-150	Na:∅60×12, +/-	NaI(Tl)	198±23	Abbondano	1973	1.0	1.0	-9.4	198±23
			14.7	90	Na:∅38.1×76.2, +/+	NaI(Tl)	183±31	Engesser	1967	1.0	1.15	+6.3	217±36
			14.1		Na:∅30×50, 15g, +/?	NaI(Tl)	42±5	Roturier	1966	1.0	?	-12.6	(s) 42±5
1636	$^{23}Na(n,n')^{23}Na$	$2076(7/2^+)\rightarrow440(5/2^+)$, p	14.7	125	$Na_4P_2O_7$∅44×70,119g,+/+	HPGe	149±11	Hlavac-2	1997	1.0	1.0	+11.6	149±11
			14.6	45-135	Na:∅100×∅??, +/-	Ge(Li)	107±12	Degtyarev	1977	1.0	1.0	+3.9	107±12
			14.2	30-150	Na:∅60×12, +/-	NaI(Tl)	166±23	Abbondano	1973	1.0	1.0	-11.6	166±23
			14.1		Na:∅30×50, 15g, +/?	NaI(Tl)	53±2	Roturier	1966	1.0	?	-15.4	(s) 53±2

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
1636	$^{23}Na(n,n'+p\beta)^{23}Na$	$2076(5/2^+)\to 440(5/2^+)$,p+d	14.8	125	NaCl:Ø30×40, +/+	Ge(Li)	303±43	Yamamoto	1978	1.0	1.0	+10.3	303±43
			14.7	90	Na:Ø38.1×76.2, +/+	NaI(Tl)	236±24	Engesser	1967	1.0	1.05	+6.9	255±25
12-Magnesium (24 - 79%, 25 - 10%, 26 - 11%)													
350	$^{24}Mg(n,\alpha)^{21}Ne$	$350(5/2^+)\to 0(3/2^+)$, p	15.0	80	Mg:Ø153×54, +/+	Ge(Li)	76.7±13	Nyberg	1971	0.91	?	+6.0	75.8±12
			14.1	90	Mg:Ø38.1×76.2, +/+	NaI(Tl)	146±48	Engesser	1967	1.0	?	-4.8	141±48
472	$^{24}Mg(n,p)^{24}Na$	$472(1^+)\to 0(4^+)$, 20ms	14.9	93	No Information, +/+	NaI(Tl)	50±10	Zong-Ren	1979	1.0	?	+7.9	57.9±10
			15.0	80	Mg:Ø153×54, +/+	Ge(Li)	126±20	Nyberg	1971	0.91	?	+9.9	125±18
			14.7	90	Mg:Ø38.1×76.2, +/+	NaI(Tl)	131±26	Engesser	1967	1.0	?	+0.4	131±26
1369	$^{24}Mg(n,n')^{24}Mg$	$1369(2^+)\to 0(0^+)$, p	14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	430±56	Bezotosny	1980	1.0	1.0	-13.6	416±56
			14.9	93	No Information, +/+	NaI(Tl)	368±29	Zong-Ren	1979	1.0	1.28	+10.9	379±29
			14.2	90-130	Ø44×6,Ø31×Ø25×32,+/+	NaI(Tl)	364±38	Drake	1978	1.0	1.0	-8.2	356±38
			14.2	90,122	No Information, +/+	NaI(Tl)	342±38	Arthur	1975	1.0	1.0	-8.2	334±38
			14.2	30-150	Mg:Ø60×12, +/-	NaI(Tl)	628±66	Abbondano	1973	1.0	1.0	-8.2	620±66
			14.1	55,90	Mg:Ø??×20, +/+	Ge(Li)	387±15	Grenier	1974	1.0	1.0	-10.9	376±15
			14.4	90	Mg:77×75×18, 168g, ?/?	NaI(Tl)	307±23	McKinney	1972	0.74	1.28	-2.7	288±22
			15.0	80	Mg:Ø153×54, +/+	Ge(Li)	412±62	Nyberg	1971	0.91	1.22	+13.7	389±56
			14.7	90	Mg:Ø38.1×76.2, +/+	NaI(Tl)	388±39	Engesser	1967	1.0	1.28	+5.5	502±50
			14.1	30-90	Mg:Ø??×20, +/+	NaI(Tl)	619±60	Martin	1965	1.0	1.0	-10.9	608±60
			14.1	50-160	Mg:Ø??×20, +/+	NaI(Tl)	619±32	Stewart	1964	1.0	1.0	-10.9	608±32
			14.1		Mg:Ø30×50, 14.5g, +/?	NaI(Tl)	310±34	Roturier	1966	1.0	?	-10.9	299±34
1809	$^{26}Mg(n,n')^{26}Mg$	$1809(2^+)\to 0(0^+)$, p	14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	75±17	Bezotosny	1980	1.0	1.0	-2.2	72.8±17
			14.2	90,122	No Information, +/+	NaI(Tl)	104±15	Arthur	1975	1.0	1.0	-1.3	103±15
			15.0	80	Mg:Ø153×54, +/+	Ge(Li)	81.7±13	Nyberg	1971	0.91	?	+2.2	76.5±12
			14.7	90	Mg:Ø38.1×76.2, +/+	NaI(Tl)	72±8	Engesser	1967	1.0	?	+0.9	72.9±8
			14.1		Mg:Ø30×50, 14.5g, +/?	NaI(Tl)	322±36	Roturier	1966	1.0	?	-1.8	(s) 320±36
			14.7	90	Mg:Ø38.1×76.2, +/+	NaI(Tl)	51±10	Engesser	1967	1.0	?	+0.9	51.9±10
3867	$^{24}Mg(n,n')^{24}Mg$	$5236(3^+)\to 1369(2^+)$, p	14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	26±16	Bezotosny	1980	1.0	1.0	-0.9	25.1±16
			15.0	80	Mg:Ø153×54, +/+	Ge(Li)	32.7±5.0	Nyberg	1971	0.91	?	+0.9	30.7±4.6
			14.7	90	Mg:Ø38.1×76.2, +/+	NaI(Tl)	28±9	Engesser	1967	1.0	?	+0.3	28.3±9
4239	$^{24}Mg(n,n')^{24}Mg$	$4239(2^+)\to 0(0^+)$, p	14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	28±25	Bezotosny	1980	1.0	1.0	-1.1	26.9±25
			15.0	80	Mg:Ø153×54, +/+	Ge(Li)	26.4±3.8	Nyberg	1971	0.91	?	+1.1	26.4±3.8
			14.7	90	Mg:Ø38.1×76.2, +/+	NaI(Tl)	36±8	Engesser	1967	1.0	?	+0.4	36.4±8
4641	$^{24}Mg(n,n')^{24}Mg$	$6010(4^+)\to 1369(2^+)$, p	14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	22±11	Bezotosny	1980	1.0	1.0	-0.8	21.2±11
			15.0	80	Mg:Ø153×54, +/+	Ge(Li)	20.1±3.8	Nyberg	1971	0.91	?	+0.8	19.1±3.5
			14.7	90	Mg:Ø38.1×76.2, +/+	NaI(Tl)	28±9	Engesser	1967	1.0	?	+0.3	28.3±9
13-Aluminium (27 -100%)													
472	$^{27}Al(n,\alpha)^{27}Na$	$472(1^+)\to 0\ (4^+)$, 20ms	14.9	55-140	Al:Ø30.4×30.2, 60.5, +/+	Ge(Li)	51±1.5	Hongyu-1	1997	1.0	1.0		51±1.5
			15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	59±6	Lashuk	1994	0.85	?		50±5.1
			14.8	125	Al:Ø30×40, +/+	Ge(Li)	88±11	Yamamoto	1978	1.0	1.0		88±11
			15.0	80	Al:Ø140×45, +/+	Ge(Li)	89±14	Nyberg	1971	0.91	?		81±13
844	$^{27}Al(n,n')^{27}Al$	$844(1/2^+)\to 0(5/2^+)$, p	14.7	125	Al:80×80×5, 86.2g, +/+	HPGe	35.9±6.9	Hlavac-1	1997	1.0	1.0		35.9±6.9
			14.9	55-140	Al:Ø30.4×30.2, 60.5, +/+	Ge(Li)	23.2±1.0	Hongyu	1997	1.0	1.0		23.2±1.0
			14.1	30-150	Ø36×Ø26×70, +/+	Ge	26±2	Murata	1988	1.0	1.0		26±2
			14.9	93	No Information, +/+	NaI(Tl)	30±10	Zong-Ren	1979	1.0	?		30±10
			14.0	0-180	Ø70, +/-	NaI(Tl)	58±6	Bezotosny	1976	1.0	1.0		58±6
			14.2	122	No Information, +/+	NaI(Tl)	69±14	Arthur	1975	1.0	1.0		69±14
			13.4	125	Ø240×Ø120×10, +/+	Ge(Li)	8.4±4.1	Voss	1971	1.0	1.0		(s) 8.4±4.1

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction		Corrected σ
			14.6	0-180	No information, +/+	NaI(Tl)	92±24	Burimov	1969	?	1.0	92±24
			14.1	90	Al:∅100×20, +/+	Ge(Li)	35±3	Clayeux	1969	1.0	?	35±3
			14.1		Al:∅30×50, 94.5g, +/?	NaI(Tl)	10±4	Roturier	1966	1.0	?	(s) 10±4
844	Al(n,p)Mg(β)^{27}Al	844(1/2$^+$)→0(5/2$^+$), 10s	14.9	55-140	Al:∅30.4×30.2, 60.5, +/+	Ge(Li)	46.7±2.3	Hongyu-1	1997	1.0	1.0	46.7±2.3
844	^{27}Al(n,n'+pβ)^{27}Al	844(1/2$^+$)→0(5/2$^+$), p+d	15.4	90	∅190×∅110×?, +/+	Ge(Li)	87±10	Lashuk	1994	0.85	?	74±8.5
			14.9	55-140	Al:∅30.4×30.2, 60.5, +/+	Ge(Li)	69.9±2.5	Hongyu	1994	1.0	1.0	69.9±2.5
			14.8	125	Al:∅30×40, +/+	Ge(Li)	97±15	Yamamoto	1978	1.0	1.0	97±15
			14.4	90	Al:74×74×13, 197g, ?/?	NaI(Tl)	52±8	McKinney	1972	0.74	?	38.5±5.9
			14.7	90	Al:∅38.1×76.2, +/+	NaI(Tl)	88±18	Engesser	1967	1.0	?	88±18
			14	0-180	∅60×30, +/+	NaI(Tl)	102±13	Bezotosny	1966	1.0	1.0	102±13
985	^{27}Al(n,p)^{27}Mg	985(3/2$^+$)→0(1/2$^+$) p	14.6	125	Al:80×80×5, 86.2g, +/+	HPGe	32.2±2.7	Hlavac-1	1997	1.0	1.0	32.2±2.7
			14.9	55-140	Al:∅30.4×30.2, 60.5, +/+	Ge(Li)	21.9±0.9	Hongyu-1	1997	1.0	1.0	21.9±0.9
			14.6	125	Al:80×80×5, 86.2g, +/+	Ge(Li)	38.7±4.1	Hitzenberger	1994	1.0	1.0	38.7±4.1
			14.1	30-150	∅36×∅26×70, +/+	Ge	24±2	Murata	1988	1.0	1.0	24±2
			14.8	125	Al:∅30×40, +/+	Ge(Li)	31.4±8	Yamamoto	1978	1.0	1.0	31.4±8
			14.2	55	C:∅30×40, +/+	Ge(Li)	63±13	Hino	1976	1.0	1.0	63±13
			14.9	80	Al:∅150×30, +/+	Ge(Li)	51.5±8.8	Nyberg	1971	1.0	?	51.5±8.8
1014	^{27}Al(n,n')^{27}Al	1014(3/2$^+$)→0(5/2$^+$), p	14.7	125	Al:80×80×5, 86.2g, +/+	HPGe	72.1±5.6	Hlavac-1	1997	1.0	1.0	72.1±5.6
			14.9	55-140	Al:∅30.4×30.2, 60.5, +/+	Ge(Li)	61.7±2.0	Hongyu	1994	1.0	1.0	61.7±2.0
			14.6	125	Al:80×80×5, 86.2g, +/+	Ge(Li)	69.7±5.7	Hitzenberger	1994	1.0	1.0	69.7±5.7
			14.1	30-150	∅36×∅26×70, +/+	Ge	60±5	Murata	1988	1.0	1.0	60±5
			14.9	93	No Information, +/+	NaI(Tl)	92±9	Zong-Ren	1979	1.0	?	(s) 92±9
			14.2	55	Al:∅30×40, +/+	Ge(Li)	197±36	Hino	1976	1.0	1.0	197±36
			14.0	0-180	∅70, +/-	NaI(Tl)	110±13	Bezotosny	1976	1.0	1.0	(s) 110±13
			14.2	120	No Information, +/+	NaI(Tl)	133±25	Arthur	1975	1.0	1.0	(s) 133±25
			14.9	80	Al:∅140×45, +/+	Ge(Li)	89.2±14	Nyberg	1971	0.91	?	81.2±13
			13.3	125	Al:∅240×∅120×10, +/+	Ge(Li)	57.4±8.0	Voss	1971	1.0	1.0	57.4±8.0
			14.6	0-180	No information, +/+	NaI(Tl)	190±60	Burimov	1969	0.96	1.0	(s) 182±58
			14.1	90	Al:∅100×20, +/+	Ge(Li)	40±4	Clayeux	1969	1.0	?	40±4
			14.1		Al:∅30×50, 94.5g, ?/?	NaI(Tl)	53±6	Roturier	1966	1.0	?	(s) 53±6
1014	Al(n,p)Mg(β)^{27}Al	1014(3/2$^+$)→0(5/2$^+$), 10ms	14.9	55-140	Al:∅30.4×30.2, 60.5, +/+	Ge(Li)	23.5±1.5	Hongyu-1	1994	1.0	1.0	23.5±1.5
1014	^{27}Al(n,n'+pβ)^{27}Al	1014(3/2$^+$)→0(3/2$^+$), p+d	14.9	55-140	Al:∅30.4×30.2, 60.5, +/+	Ge(Li)	85.2±2.5	Hongyu	1994	1.0	1.0	85.2±2.5
			15.4	90	∅190×∅110×?, +/+	Ge(Li)	101±11	Lashuk	1994	0.85	?	85.9±9.4
			14.8	125	Al:∅30×40, +/+	Ge(Li)	97±13	Yamamoto	1978	1.0	1.0	97±13
			14.4	90	Al:74×77×13, 197g, ?/?	NaI(Tl)	63±11	McKinney	1972	1.0	?	63±11
			14.7	90	Al:∅38.1×76.2, +/+	NaI(Tl)	132±14	Engesser	1967	1.0	?	(s) 132±14
			14		∅60×30, +/+	NaI(Tl)	92±12	Bezotosny	1966	1.0	?	92±12
1698	^{27}Al(n,p)^{27}Mg	1698(5/2$^+$)→0(1/2$^+$), p	14.6	125	Al:80×80×5, 86.2g, +/+	HPGe	27.8±2.8	Hlavac-1	1997	1.0	1.0	27.8±2.8
			14.9	55-140	Al:∅30.4×30.2, 60.5, +/+	Ge(Li)	25.1±5.0	Hongyu-1	1997	1.0	1.0	25.1±5.0
			14.6	125	Al:80×80×5, 86.2g, +/+	Ge(Li)	33.8±8.4	Hitzenberger	1994	1.0	1.0	33.8±8.4
			14.1	30-150	∅36×∅26×70, +/+	Ge	26±3	Murata	1988	1.0	1.0	26±3
			14.8	125	Al:∅30×40, +/+	Ge(Li)	47.8±9	Yamamoto	1978	1.0	1.0	47.8±9
1720	^{27}Al(n,n')^{27}Al	2735(5/2$^+$)→1014(3/2$^+$), p	14.9	55-140	Al:∅30.4×30.2, 60.5, +/+	Ge(Li)	26.1±4.0	Hongyu-1	1997	1.0	1.0	26.1±4.0
			14.6	125	Al:80×80×5, 86.2g, +/+	Ge(Li)	192±17	Hitzenberger	1994	1.0	1.0	(s) 192±17
			15.4	90	∅190×∅110×?, +/+	Ge(Li)	100±11	Lashuk	1994	0.85	?	85±9.4
			14.8	90	Cyllinder ?? , ?/?	NaI(Tl)	353±64	Nellis	1971	1.0	?	(s) 353±64
			14.9	80	Al:∅150×30, +/+	Ge(Li)	60.3±11	Nyberg	1971	0.91	?	54.9±10
			13.3	125	Al:∅240×∅120×10, +/+	Ge(Li)	30.0±4.8	Voss	1971	1.0	1.0	30.0±4.8

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction		Corrected σ
			14.7	90	Al:Ø38.1×76.2, +/+	NaI(Tl)	54±18	Engesser	1967	1.0	?	54±18
1809	^{27}Al(n,d)^{26}Mg	1809(2^+)→0(0^+), p	14.6	125	Al:80×80×5, 86.2g, +/+	HPGe	244±21	Hlavac-1	1997	1.0	1.0	244±21
			14.9	55-140	Al:Ø30.4×30.2, 60.5, +/+	Ge(Li)	164±5.3	Hongyu-1	1997	1.0	1.0	164±5.3
			14.6	125	Al:80×80×5, 86.2g, +/+	Ge(Li)	233±13	Hitzenberger	1994	1.0	1.0	233±13
			14.1	30-150	Ø36×Ø26×70, +/+	Ge	142±12	Murata	1988	1.0	1.0	142±12
			14.9	90	Al:Ø30×30, +/+	Ge(Li)	176±12	Hongyu	1986	1.0	?	176±12
			14.9	93	No Information, +/+	NaI(Tl)	152±21	Zong-Ren	1979	1.0	?	152±21
			14.8	125	Al:Ø30×40, +/+	Ge(Li)	238±26	Yamamoto	1978	1.0	1.0	238±26
			14.0	0-180	Ø70, +/-	NaI(Tl)	175±18	Bezotosny	1976	1.0	1.0	175±18
			14.2	55	Al:Ø30×40, +/+	Ge(Li)	126±20	Hino	1976	1.0	1.0	126±20
			14.2	122	No Information, +/+	NaI(Tl)	209±31	Arthur	1975	1.0	1.0	209±31
			14.1	90	Al:Ø100×20, +/+	Ge(Li)	127±10	Clayeux	1969	1.0	?	127±10
			14.9	80	Al:Ø150×30, +/+	Ge(Li)	182±29	Nyberg	1971	0.91	?	166±26
			14.7	90	Al:Ø38.1×76.2, +/+	NaI(Tl)	172±34	Engesser	1967	1.0	?	172±34
			14.1		Al:Ø30×50, 94.5g, ?/?	NaI(Tl)	220±35	Roturier	1966	1.0	?	220±35
2211	^{27}Al(n,n')^{27}Al	2211($7/2^+$)→0($1/2^+$), p	14.6	125	Al:80×80×5, 86.2g, +/+	HPGe	176±13	Hlavac-1	1997	1.0	1.0	176±13
			14.9	55-140	Al:Ø30.4×30.2, 60.5, +/+	Ge(Li)	122±7	Hongyu-1	1997	1.0	1.0	122±7
			14.6	125	Al:80×80×5, 86.2g, +/+	Ge(Li)	192±17	Hitzenberger	1994	1.0	1.0	192±17
			15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	100±11	Lashuk	1994	0.85	?	85±9.4
			14.9	93	No Information, +/+	NaI(Tl)	118±14	Zong-Ren	1979	1.0	?	118±14
			14.8	125	Al:Ø30×40, +/+	Ge(Li)	55±38	Yamamoto	1978	1.0	1.0	55±38
			14.0	0-180	Ø70, +/-	NaI(Tl)	192±20	Bezotosny	1976	1.0	1.0	192±20
			14.2	55	Al:Ø30×40, +/+	Ge(Li)	204±33	Hino	1976	1.0	1.0	204±33
			14.2	122	No Information, +/+	NaI(Tl)	169±25	Arthur	1975	1.0	1.0	169±25
			14.8	90	Cyllinder ?? , ?/?	NaI(Tl)	248±50	Nellis	1971	1.0	?	248±50
			13.3	125	Al:Ø240×Ø120×10, +/+	Ge(Li)	95±13	Voss	1971	1.0	1.0	95±13
			14.6	0-180	No information, +/+	NaI(Tl)	130±30	Burimov	1969	0.98	1.0	127±29
			14.1	90	Al:Ø100×20, +/+	Ge(Li)	104±19	Clayeux	1969	1.0	1.0	104±19
			14.2	0-180	Shell ?? , +/+	NaIanti	110±40	Maslov	1968	1.0	1.0	110±40
			14.9	80	Al:Ø150×30, +/+	Ge(Li)	134±23	Nyberg	1971	0.91	?	122±21
			14.7	90	Al:Ø38.1×76.2, +/+	NaI(Tl)	136±14	Engesser	1967	1.0	?	136±14
			14.1		Al:Ø30×50, 94.5g, ?/?	NaI(Tl)	100±15	Roturier	1966	1.0	?	100±15
3004	^{27}Al(n,n')^{27}Al	3004($9/2^+$)→0($1/2^+$), p	14.6	125	Al:80×80×5, 86.2g, +/+	HPGe	137±12	Hlavac-1	1997	1.0	1.0	137±12
			14.9	55-140	Al:Ø30.4×30.2, 60.5, +/+	Ge(Li)	90.1±7.7	Hongyu-1	1997	1.0	1.0	90.1±7.7
			14.6	125	Al:80×80×5, 86.2g, +/+	Ge(Li)	146±18	Hitzenberger	1994	1.0	1.0	146±18
			15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	111±12	Lashuk	1994	0.85	?	94.4±10
			14.0	90	Al:Ø16×30, +/+	NaI(Tl)	102±13	Drosg	1991	1.0	?	102±13
			14.1	30-150	Ø36×Ø26×70, +/+	Ge	88±8	Murata	1988	1.0	1.0	88±8
			14.9	90	Al:Ø30×30, +/+	Ge(Li)	33±10	Hongyu	1986	1.0	?	(s) 33±10
			14.9	93	No Information, +/+	NaI(Tl)	101±16	Zong-Ren	1979	1.0	?	101±16
			14.8	125	Al:Ø30×40, +/+	Ge(Li)	139±23	Yamamoto	1978	1.0	1.0	139±23
			14.2	55	Al:Ø30×40, +/+	Ge(Li)	173±28	Hino	1976	1.0	1.0	173±28
			14.8	90	Cyllinder ?? , ?/?	NaI(Tl)	178±36	Nellis	1971	1.0	?	178±36
			14.2	0-180	Shell ?? , +/+	NaIanti	102±30	Maslov	1968	1.0	1.0	102±30
			14.2	90-130	Ø44×6.Ø31×Ø25×32,+/+	NaI(Tl)	96±11	Drake	1978	1.0	1.0	96±11
			14.0	0-180	Al:Ø70, +/-	NaI(Tl)	135±13	Bezotosny	1976	1.0	1.0	135±13
			14.2	122	No Information, +/+	NaI(Tl)	105±16	Arthur	1975	1.0	1.0	105±16
			14.9	80	Al:Ø150×30, +/+	Ge(Li)	81.6±14	Nyberg	1971	0.91	?	74.5±13

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
			14.1	125	Al:Ø100×20, +/+	Ge(Li)	98±18	Clayeux	1969	1.0	1.0		98±18
			14.2	0-180	Shell ?? , +/+	NaIanti	102±30	Maslov	1968	1.0	1.0		102±30
			14.7	90	Al:Ø38.1×76.2, +/+	NaI(Tl)	99±20	Engesser	1967	1.0	?		99±20
			14	0-180	Ø60×30, +/+	NaI(Tl)	131±20	Bezotosny	1966	1.0	1.0		131±20
			14.1		Al:Ø30×50, 94.5g, ?/?	NaI(Tl)	65±9	Roturier	1966	1.0	?		65±9
3203	^{27}Al(n,n')^{27}Al	4054(?)→844(1/2$^+$), p	14.8	125	Al:Ø30×40, +/+	Ge(Li)	45±14	Yamamoto	1978	1.0	1.0		45±14
			14.9	80	Al:Ø140×45, +/+	Ge(Li)	13.8±7.5	Nyberg	1971	0.91	?		12.6±6.8
			14.7	90	Al:Ø38.1×76.2, +/+	NaI(Tl)	21±8	Engesser	1967	1.0	?		21±8
14-Silicon (28 - 92.2%, 29 -4.7%, 30 - 3.1%)													
390	^{28}Si(n,α)^{25}Mg	975(3/2$^+$)→585(5/2$^+$), p	14.7	125	Si:Ø100×10,Ø100×5,+/+	HPGe	25±4	Hlavac-1	1996	1.0	1.0		25±4
585	^{28}Si(n,α)^{25}Mg	585(1/2$^+$)→0(5/2$^+$), p	14.7	125	Si:Ø100×10,Ø100×5,+/+	HPGe	72±11	Hlavac-1	1996	1.0	1.0		72±11
			14.1	70, 90	Si:Ø28×96, +/-	Ge(Li)	17±1	Lychagin	1992	1.0	?		17±1
			14.9	90	Si:Ø30×30, +/+	Ge(Li)	58±3	Guoying	1991	1.0	?		58±3
			14.1	30-150	Ø25×50, +/+	Ge	36±3	Murata	1988	1.0	1.0		36±3
			14.7	90	Si:Ø38.1×76.2, +/+	NaI(Tl)	59±20	Engesser	1967	1.0	?		59±20
844	^{28}Si(n,np)^{27}Al	844(1/2$^+$)→0(5/2$^+$), p	14.7	125	Si:Ø100×10,Ø100×5,+/+	HPGe	10±2	Hlavac	1996	1.0	1.0		10±2
941	^{28}Si(n,p)^{28}Al	972(0$^+$)→31(2$^+$), p	14.7	125	Si:Ø100×10,Ø100×5,+/+	HPGe	17±3	Hlavac	1996	1.0	1.0		17±3
			14.9	90	Si:Ø30×30, +/+	Ge(Li)	36±14	Guoying	1991	1.0	?		36±14
			14.1	30-150	Ø25×50, +/+	Ge	9±1	Murata	1988	1.0	1.0		9±1
975	^{28}Si(n,α)^{25}Mg	975(3/2$^+$)→(5/2$^+$), p	14.7	125	Si:Ø100×10,Ø100×5,+/+	HPGe	41±6	Hlavac	1996	1.0	1.0		41±6
983	^{28}Si(n,p)^{28}Al	1014(3$^+$)→31(3$^+$), p	14.7	125	Si:Ø100×10,Ø100×5,+/+	HPGe	22±3	Hlavac	1996	1.0	1.0		22±3
			14.9	90	Si:Ø30×30, +/+	Ge(Li)	26±1	Guoying	1991	1.0	?		26±1
			14.1	30-150	Ø25×50, +/+	Ge	24±2	Murata	1988	1.0	1.0		24±2
			14.9	93	No Information, +/+	NaI(Tl)	119±14	Zong-Ren	1979	1.0	?		(s) 119±14
1014	^{28}Si(n,np)^{27}Al	1014(3/2$^+$)→0(5/2$^+$), p	14.7	125	Si:Ø100×10,Ø100×5,+/+	HPGe	22±4	Hlavac	1996	1.0	1.0		22±4
1589	^{28}Si(n,p)^{28}Al	1620(1$^+$)→31(3$^+$), p	14.7	125	Si:Ø100×10,Ø100×5,+/+	HPGe	24±4	Hlavac	1996	1.0	1.0		24±4
1779	^{28}Si(n,n')^{28}Si	1779(2$^+$)→0(0$^+$), p	14.7	125	Si:Ø100×10,Ø100×5,+/+	HPGe	390±37	Hlavac	1996	1.0	1.0		390±37
			14.9	55-140	No Information, +/+	Ge(Li)	407±25	Hongyu	1994	1.0	1.0		407±25
			14.1	70, 90	Si:Ø28×96, +/-	Ge(Li)	344±52	Lychagin	1992	1.0	1.01		347±52
			14.9	90	Si:Ø30×30, +/+	Ge(Li)	488±29	Guoying	1991	1.0	1.01		493±29
			14.0	90	Si:Ø16×30, +/+	NaI(Tl)	412±35	Drosg	1991	1.0	1.01		416±35
			14.1	30-150	Ø25×50, +/+	Ge	310±25	Murata	1988	1.0	1.0		310±25
			14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	410±45	Bezotosny	1980	1.0	1.0		410±45
			14.9	93	No Information, +/+	NaI(Tl)	359±36	Zong-Ren	1979	1.0	1.01		363±36
			14.2	90-130	Ø44×6,Ø31×Ø25×32,+/+	NaI(Tl)	388±46	Drake	1978	1.0	1.0		388±46
			14.2	30-150	Si:Ø60×12, +/-	NaI(Tl)	373±40	Abbondano	1973	1.0	1.0		373±40
			14.1	55, 90	Si:Ø??×20, +/+	Ge(Li)	293±28	Grenier	1974	1.0	1.0		293±28
			14.1		Si:Ø30×50, 87.9g, ?/?	NaI(Tl)	450±45	Roturier	1966	1.0	?		450±45
			14.1	30-90	No information, +/+	NaI(Tl)	471±70	Martin	1965	1.0	1.0		471±70
1779	^{28}Si(n,p)Al(β)^{28}Si	1779(2$^+$)→0(0$^+$), 2m	14.9	55-140	No Information, +/+	Ge(Li)	232±16	Hongyu	1994	1.0	1.0		232±16
1779	^{28}Si(n,n'+pβ)^{28}Si	1779(2$^+$)→0(0$^+$), p+d	14.9	55-140	Si:Ø30×30, +/+	Ge(Li)	639±30	Hongyu	1994	1.0	1.0		639±30
			14.7	90	Si:Ø38.1×76.2, +/+	NaI(Tl)	589±59	Engesser	1967	1.0	?		589±59
2839	^{28}Si(n,n')^{28}Si	4618(4$^+$)→1779(2$^+$), p	14.7	125	Si:Ø100×10,Ø100×5,+/+	HPGe	95±12	Hlavac	1996	1.0	1.0		95±12
			14.1	70, 90	Si:Ø28×96, +/-	Ge(Li)	30±5	Lychagin	1992	1.0	?		30±5
			14.9	90	Si:Ø30×30, +/+	Ge(Li)	66±6	Guoying	1991	1.0	1.0		66±6
			14.1	30-150	Ø25×50, +/+	Ge	48±5	Murata	1988	1.0	1.0		48±5
			14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	67±11	Bezotosny	1980	1.0	1.0		67±11
			14.7	90	Si:Ø38.1×76.2, +/+	NaI(Tl)	67±8	Engesser	1967	1.0	?		67±8

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
5100	^{28}Si(n,n')^{28}Si	6879(0$^+$)→1779(2$^+$), p	14.9	90	Si:Ø30×30, +/+	Ge(Li)	31±6	Guoying	1991	1.0	?		31±6
			14.7	90	Si:Ø38.1×76.2, +/+	NaI(Tl)	49±10	Engesser	1967	1.0	?		49±10
			14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	35±5	Bezotosny	1980	1.0	1.0		35±5
6879	^{28}Si(n,n')^{28}Si	6879(0$^+$)→0(0$^+$), p	14.9	90	Si:Ø30×30, +/+	Ge(Li)	36±5	Guoying	1991	1.0	?		36±5
			14.7	90	Si:Ø38.1×76.2, +/+	NaI(Tl)	46±16	Engesser	1967	1.0	?		46±16
			14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	21±8	Bezotosny	1980	1.0	1.0		21±8
15-Phosphorus (31-100%)													
1266	^{31}P(n,n')^{31}P	1266(3/2$^+$)→0(1/2$^+$), p	14.7	125	$Na_4P_2O_7$,Ø44×70,119g,+/+	HPGe	186±15	Hlavac-2	1997	1.0	1.0		186±15
			14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	132±17	Bezotosny	1980	1.0	1.0		132±17
			14.1		P:Ø30×50, 36.4g, +/+	NaI(Tl)	80±11	Roturier	1966	1.0	?		80±11
2149	^{31}P(n,n')^{31}P	3415(7/2$^+$)→1266(3/2$^+$),p	14.7	125	$Na_4P_2O_7$,Ø44×70,119g,+/+	HPGe	51±9	Hlavac-2	1997	1.0	1.0		51±9
2234	^{31}P (n,n') ^{31}P	2234(5/2$^+$)→0(1/2$^+$), p	14.7	125	$Na_4P_2O_7$,Ø44×70,119g,+/+	HPGe	390±30	Hlavac-2	1997	1.0	1.0		390±30
			14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	345±60	Bezotosny	1980	1.0	1.0		345±60
			14.1		P:Ø30×50, 36.4g, , +/+	NaI(Tl)	210±30	Roturier	1966	1.0	?		210±30
16-Sulphur (32 - 95%, 33 - 0.75%, 34 - 4.21%)													
1273	^{32}S(n,α)^{29}Si	1273(3/2$^+$)→0(1/2$^+$), p	14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	124±13	Bezotosny	1980	1.0	1.0		124±13
			14.2	30-150	S:Ø60×12, +/-	NaI(Tl)	179±21	Abbondano	1973	1.0	1.0		179±21
			14.7	90	S:Ø38.1×76.2, +/+	NaI(Tl)	113±13	Engesser	1967	1.0	0.90		102±12
			14.1		S:Ø30×50, 67.4g, +/+	NaI(Tl)	105±12	Roturier	1966	1.0	?		105±12
1720	^{32}S(n,n')^{32}S	?(?$^+$)→?(?$^+$), p	14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	175±21	Bezotosny	1980	1.0	1.0		175±21
2028	^{32}S(n,α)^{29}Si	2028(5/2$^+$)→0(1/2$^+$), p	14.2	30-150	S:Ø60×12, +/-	NaI(Tl)	115±26	Abbondano	1973	1.0	1.0		115±26
2230	^{32}S(n,n')^{32}S	2230(2$^+$)→0(0$^+$)p	14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	358±39	Bezotosny	1980	1.0	1.0		358±39
			14.2	30-150	S:Ø60×12, +/-	NaI(Tl)	278±43	Abbondano	1973	1.0	1.0		278±43
			14.7	90	S:Ø38.1×76.2, +/+	NaI(Tl)	192±20	Engesser	1967	1.0	1.33		255±27
			14.1	30-90	No information, +/+	NaI(Tl)	332±50	Martin	1965	1.0	1.0		332±50
			14.1		S:Ø30×50, 67.4g, +/+	NaI(Tl)	220±30	Roturier	1966	1.0	?		220±30
2770	^{32}S(n,n')^{32}S	5006(3$^-$)→2230(2$^+$), p	14.0	90	S:Ø38.1×76.2, +/+	NaI(Tl)	46±9	Engesser	1967	1.0	?		46±9
			14.1		S:Ø30×50, 67.4g, +/+	NaI(Tl)	40±8	Roturier	1966	1.0	?		40±8
4460	^{32}S(n,n')^{32}S	4460(4$^+$)→0(0$^+$) p	14.7	90	S:Ø38.1×76.2, +/+	NaI(Tl)	94±19	Engesser	1967	1.0	?		94±19
17-Clorine (35 - 75.8%, 37 - 24.2%)													
1219	^{35}Cl(n,n')^{35}Cl	1219(1/2$^+$)→0(3/2$^+$), p	14.7	90	Cl_4C:Ø38.1×76.2, +/+	NaI(Tl)	96±20	Engesser	1967	1.0	?		96±20
1290	^{35}Cl(n,n')^{35}Cl	?→?	14.7	90	Cl_4C:Ø38.1×76.2, +/+	NaI(Tl)	48±16	Engesser	1967	1.0	?		48±16
			14.1		NaCl:Ø30×50, 75.2g, +/+	NaI(Tl)	38±12	Roturier	1966	1.0	?		38±12
1727	^{37}Cl(n,n')^{37}Cl	1727(1/2$^+$)→0(3/2$^+$), p	14.8	125	NaCl:Ø30×40, +/+	Ge(Li)	289±89	Yamamoto	1987	1.0	1.0		289±89
1763	^{35}Cl(n,n')^{35}Cl	1763(5/2$^+$)→0(3/2$^+$), p	14.8	125	NaCl:Ø30×40, +/+	Ge(Li)	158±43	Yamamoto	1987	1.0	1.0		158±43
			14.7	90	Cl_4C:Ø38.1×76.2, +/+	NaI(Tl)	82±16	Engesser	1967	1.0	?		82±16
2127	^{35}Cl(n,d)^{34}S	2127(2$^+$)→0(0$^+$), p	14.8	125	NaCl:Ø30×40, +/+	Ge(Li)	332±79	Yamamoto	1987	1.0	1.0		332±79
			14.7	90	Cl_4C:Ø38.1×76.2, +/+	NaI(Tl)	215±23	Engesser	1967	1.0	?		215±23
3163	^{35}Cl(n,n')^{35}Cl	3163(7/2$^-$)→0(3/2$^+$), p	14.7	90	Cl_4C:Ø38.1×76.2, +/+	NaI(Tl)	73±15	Engesser	1967	1.0	?		73±15
19-Potassium (39 - 93.3%, 41 - 6.7%)													
788	K(n,α)^{36}Cl	788(3$^+$)→0(2$^+$), p	14.6	125	KOH:Ø84×12.5, 56.1g, +/+	HPGe	20.1±2.2	Hlavac-2	1997	1.0	1.0		20.1±2.2
			14.7	90	K:Ø38.1×76.2, +/+	NaI(Tl)	79±16	Engesser	1967	1.0	?		79±16
1165	K(n,α)^{36}Cl	1165(1$^+$)→0(2$^+$), p	14.6	125	KOH:Ø84×12.5, 56.1g, +/+	HPGe	17.3±1.6	Hlavac-2	1997	1.0	1.0		17.3±1.6
			14.7	90	K:Ø38.1×76.2, +/+	NaI(Tl)	43±9	Engesser	1967	1.0	?		43±9
1267	K(n,p)^{39}Ar	1267(3/2$^-$)→0(7/2$^-$), p	14.6	125	KOH:Ø84×12.5, 56.1g, +/+	HPGe	19.3±2.2	Hlavac-2	1997	1.0	1.0		19.3±2.2
			14.7	90	K:Ø38.1×76.2, +/+	NaI(Tl)	48±16	Engesser	1967	1.0	?		48±16
1677	K(n,n')^{41}K	1677→0 (p)	14.7	90	K:Ø38.1×76.2, +/+	NaI(Tl)	112±11	Engesser	1967	1.0	?		112±11

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
1769	K(n,d)^{39}Ar	?3937(1/2$^+$)→?2168 (p)	14.6	125	KOH:Ø84×12.5, 56.1g, +/+	HPGe	6.7±1.4	Hlavac-2	1997	1.0	1.0		6.7±1.4
			14.7	90	K:Ø38.1×76.2, +/+	NaI(Tl)	41±14	Engesser	1967	1.0	?		41±14
1951	K(n,α)^{36}Cl	1951(2$^-$)→0(2$^+$), p	14.6	125	KOH:Ø84×12.5, 56.1g, +/+	HPGe	9.7±1.6	Hlavac-2	1997	1.0	1.0		9.7±1.6
			14.7	90	K:Ø38.1×76.2, +/+	NaI(Tl)	36±13	Engesser	1967	1.0	?		36±13
2168	K(n,d)^{38}Ar	2168(2$^+$)→0(0$^+$), p	14.6	125	KOH:Ø84×12.5, 56.1g, +/+	HPGe	193±14	Hlavac-2	1997	1.0	1.0		193±14
			14.7	90	K:Ø38.1×76.2, +/+	NaI(Tl)	243±20	Engesser	1967	1.0	?		243±20
2523	^{39}K(n,n')^{39}K	2523(1/2$^+$)→0(3/2$^+$), p	14.7	90	K:Ø38.1×76.2, +/+	NaI(Tl)	39±13	Engesser	1967	1.0	?		39±13
2814	K(n,n')^{39}K	2814(7/2$^-$)→0(3/2$^+$) p	14.6	125	KOH:Ø84×12.5, 56.1g, +/+	HPGe	74±5	Hlavac-2	1997	1.0	1.0		74±5
			14.7	90	K:Ø38.1×76.2, +/+	NaI(Tl)	102±20	Engesser	1967	1.0	?		102±20
3598	K(n,n')^{39}K	3598(9/2$^-$)→0(3/2$^+$) (p)	14.6	125	KOH:Ø84×12.5, 56.1g, +/+	HPGe	23±3	Hlavac-2	1997	1.0	1.0		23±3
3680	K(n,d)^{38}Ar	?→0 (p)	14.6	125	KOH:Ø84×12.5, 56.1g, +/+	HPGe	98±10	Hlavac-2	1997	1.0	1.0		98±10
20-Calcium (40 - 96.9, 42 - 0.7%, 43 - 0.1%, 44 - 2.1%, 48 - 0.2%)													
770	^{40}Ca(n,p)^{40}K	800(2$^-$)→30(3$^-$), p	14.7	90	Ca:Ø38.1×76.2, +/+	NaI(Tl)	70±15	Engesser	1967	1.0	?		70±15
892	^{40}Ca(n,p)^{40}K	892(5$^-$)→0(4$^-$), p	14.1	90	Ca:Ø??×20, +/+	Ge(Li)	31±10	Grenier	1974	1.0	?		31±10
			14.7	90	Ca:Ø38.1×76.2, +/+	NaI(Tl)	60±13	Engesser	1967	1.0	?		60±13
1157	^{44}Ca(n,n')^{44}Ca	1157(2$^+$)→0(0$^+$) p	14.1	90	Ca:Ø??×20, +/+	Ge(Li)	30±10	Grenier	1974	1.0	?		30±10
			14.7	90	Ca:Ø38.1×76.2, +/+	NaI(Tl)	28±4	Engesser	1967	1.0	?		28±4
1611	^{40}Ca(n,α)^{37}Ar	1611(7/2$^-$)→30(3/2$^+$), p	14.1	90	Ca:Ø??×20, +/+	Ge(Li)	29±10	Grenier	1974	1.0	?		29±10
			14.7	90	Ca:Ø38.1×76.2, +/+	NaI(Tl)	68±8	Engesser	1967	1.0	?		68±8
2796	^{40}Ca(n,α)^{37}Ar	2796(5/2$^+$)→0(3/2$^+$), p	14.7	90	Ca:Ø38.1×76.2, +/+	NaI(Tl)	34±8	Engesser	1967	1.0	?		34±8
3736	^{40}Ca(n,n')^{40}Ca	3736(3$^-$)→0(0$^+$), p	14.1	90	Ca:Ø??×20, +/+	Ge(Li)	109±28	Grenier	1974	1.0	?		109±28
			14.7	90	Ca:Ø38.1×76.2, +/+	NaI(Tl)	113±23	Engesser	1967	1.0	?		113±23
3904	^{40}Ca(n,n')^{40}Ca	3904(2$^+$)→0(0$^+$), p	14.7	90	Ca:Ø38.1×76.2, +/+	NaI(Tl)	48±16	Engesser	1967	1.0	?		48±16
			14.1		Ca:Ø30×50, 20.4g, +/+	NaI(Tl)	43±15	Roturier	1966	1.0	?		43±15
22-Titanium (46 - 8.0%, 47 - 7.3%, 48 - 73.8%, 49 - 5.5%, 50 - 5.4%)													
160	Ti(n,n'+2n)^{47}Ti	160(7/2$^-$)→0(5/2$^-$) p	15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	475±51	Lashuk	1994	0.85	?		404±43
890	Ti(n,n'+2n) ^{46}Ti	890(2$^+$)→ 0(0$^+$), p	15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	74±9	Lashuk	1994	0.85	?		62.9±7.7
			14.4		Ø58×?, +/+	Ge(Li)	48±20	Breunlich	1972	0.99	?		48±20
944	Ti(n,n'+2n) ^{48}Ti	3240(4$^+$)→2296(4$^+$), p	15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	47±6	Lashuk	1994	0.85	?		40.0±5.1
984	Ti(n,n'+2n)^{48}Ti	984(2$^+$) → 0(0$^+$), p	14.1	30-150	Ti:Ø30×Ø26×70 +/+	Ge(Li)	186±16*	Murata	1997	1.0	1.0		(s) 186±16*
			15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	671±70	Lashuk	1994	0.85	1.22		696±73
			14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	760±97	Bezotosny	1980	1.00	1.0		760±97
			14.2	30-150	Ti:Ø60×12, +/-	NaI(Tl)	702±63	Abbondano	1973	1.00	1.0		702±63
			14.4		Ø58×?, +/+	Ge(Li)	436±58	Breunlich	1972	0.99	?		436±58
1038	Ti(n,n'+2n) ^{48}Ti	3333(6$^+$) → 2296(2$^+$), p	14.1	30-150	Ti:Ø30×Ø26×70 +/+	Ge(Li)	28±3*	Murata	1997	1.0	1.0		(s) 28±3*
			15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	190±20	Lashuk	1994	0.85	1.28		207±22
1122	Ti(n,n'+2n) ^{47}Ti	?(?$^+$) → ?(?$^+$), p	14.1	30-150	Ti:Ø30×Ø26×70 +/+	Ge(Li)	23±2.3*	Murata	1997	1.0	1.0		(s) 22.8±2.3*
1312	Ti(n,n'+2n) ^{48}Ti	2296(2$^+$) → 984(2$^+$), p	14.1	30-150	Ti:Ø30×Ø26×70 +/+	Ge(Li)	145±13*	Murata	1997	1.0	1.0		(s) 145±13*
			15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	190±20	Lashuk	1994	0.85	1.28		207±22
			14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	246±34	Bezotosny	1980	1.00	1.0		246±34
			14.2	30-150	Ti:Ø60×12, +/-	NaI(Tl)	312±57	Abbondano	1973	1.00	1.0		312±57
1437	Ti(n,n'+2n) ^{48}Ti	2421(2$^+$)→ 984(2$^+$), p	14.1	30-150	Ti:Ø30×Ø26×70 +/+	Ge(Li)	30.7±3*	Murata	1997	1.0	1.0		(s) 30.7±3*
			15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	58±8	Lashuk	1994	0.85	?		49.3±6.8
1555	Ti(n,n')^{50}Ti	1555(2$^+$)→ 0(0$^+$), p	14.1	30-150	Ti:Ø30×Ø26×70 +/+	Ge(Li)	21±2.2*	Murata	1997	1.0	1.0		(s) 21.2±2.2*
			15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	40±7	Lashuk	1994	0.85	?		34.0±6.0
			14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	30±6	Bezotosny	1980	1.00	1.0		30±6
			14.4		Ø58×?, +/+	Ge(Li)	26±14	Breunlich	1972	0.99	?		26±14

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
1762	Ti(n,n'+2n)^{49}Ti	1762(5/2$^-$)→ 0(7/2$^-$), p	14.0	0-180	Ø60×Ø54, +/+	NaI(Tl)	23±13	Bezotosny	1980	1.00	1.0		23±13
2240	Ti(n,n'+2n) ^{48}Ti	3224(3$^+$) → 984(2$^+$), p	15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	38±6	Lashuk	1994	0.85	?		32.3±5.1
2375	Ti(n,n'+2n)^{48}Ti	3359(3$^-$) → 984(2$^+$), p	14.1	30-150	Ti:Ø30×Ø26×70 +/+	Ge(Li)	39.6±4*	Murata	1997	1.0	1.0		(s) 39.6±3.8*
			15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	60±7	Lashuk	1994	0.85	?		51.0±5.6
			14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	87±35	Bezotosny	1980	1.00	1.0		87±35
					23-Vanadium (51 - 100%)								
226	^{51}V(n,2n)^{50}V	226(5$^+$)→0(6$^+$), p	14.9	30-140	V:Ø30×30, 130g, +/+	Ge(Li)	337±23	Yiming	1988	1.0	1.0		337±23
			14.9	90	V:Ø30×30, +/+	Ge(Li)	440±46	Hongyu	1986	1.0	?		440±46
320	^{51}V(n,n') ^{51}V	320(5/2$^-$)→0(7/2$^-$), p	14.9	30-140	V:Ø30×30, 130g, +/+	Ge(Li)	320±14	Yiming	1988	1.0	1.0		320±14
			14.9	90	V:Ø30×30, +/+	Ge(Li)	283±30	Hongyu	1986	1.0	?		283±30
609	^{51}V(n,n') ^{51}V	928(3/2$^-$)→0(7/2$^-$), p	14.1	30-150	V:Ø30×Ø26×70 +/+	Ge(Li)	4.9±0.6*	Murata	1997	1.0	1.0		(s) 4.9±0.6*
681	^{51}V(n,n') ^{51}V	1609(11/2$^-$)→928(3/2$^-$),p	14.1	30-150	V:Ø30×Ø26×70 +/+	Ge(Li)	3.8±0.5*	Murata	1997	1.0	1.0		(s) 3.8±0.5*
815	^{51}V(n,2n) ^{50}V	1725(?)→910(4$^+$), p	14.7	125	V:Ø30×Ø20×50,120g,+/+	HPGe	18±5	Hlavac-2	1997	1.0	1.0		18±5
			14.9	30-140	V:Ø30×30, 130g, +/+	Ge(Li)	18±2	Yiming	1988	1.0	1.0		18±2
			14.9	90	V:Ø30×30, +/+	Ge(Li)	21±3	Hongyu	1986	1.0	?		21±3
836	^{51}V(n,2n) ^{50}V	836(5$^+$)→0(6$^+$), p	14.7	125	V:Ø30×Ø20×50,120g,+/+	HPGe	34±3	Hlavac-2	1997	1.0	1.0		34±3
			14.1	30-150	V:Ø30×Ø26×70 +/+	Ge(Li)	4.9±0.6*	Murata	1997	1.0	1.0		(s) 4.9±0.6*
			14.9	30-140	V:Ø30×30, 130g, +/+	Ge(Li)	25±2	Yiming	1988	1.0	1.0		25±2
			14.9	90	V:Ø30×30, +/+	Ge(Li)	34±3	Hongyu	1986	1.0	?		34±3
910	^{51}V(n,2n) ^{50}V	910(4$^+$)→0(6$^+$), p	14.7	125	V:Ø30×Ø20×50,120g,+/+	HPGe	81±6	Hlavac-2	1997	1.0	1.0		81±6
+ 913		+1301(2$^+$)→388(2$^+$), p	14.9	30-140	V:Ø30×30, 130g, +/+	Ge(Li)	82±9	Yiming	1988	1.0	1.0		82±9
			14.1	30-150	V:Ø30×Ø26×70 +/+	Ge(Li)	15.6±1.5*	Murata	1997	1.0	1.0		(s) 15.6±1.5*
			14.9	90	V:Ø30×30, +/+	Ge(Li)	103±10	Hongyu	1986	1.0	?		103±10
929	^{51}V(n,n') ^{51}V	929(3/2$^-$)→0(7/2$^-$), p	14.7	125	V:Ø30×Ø20×50,120g,+/+	HPGe	50±4	Hlavac-2	1997	1.0	1.0		50±4
			14.1	30-150	V:Ø30×Ø26×70 +/+	Ge(Li)	11.6±1.2*	Murata	1997	1.0	1.0		(s) 11.6±1.2*
			14.9	30-140	V:Ø30×30, 130g, +/+	Ge(Li)	47±3	Yiming	1988	1.0	1.0		47±3
			14.9	90	V:Ø30×30, +/+	Ge(Li)	59±12	Hongyu	1986	1.0	?		59±12
946	^{51}V(n,2n) ^{50}V	1301(2$^+$)→355(3$^+$), p	14.7	125	V:Ø30×Ø20×50,120g,+/+	HPGe	21±3	Hlavac-2	1997	1.0	1.0		21±3
			14.9	30-140	V:Ø30×30, 130g, +/+	Ge(Li)	17±2	Yiming	1988	1.0	1.0		17±2
			14.9	90	V:Ø30×30, +/+	Ge(Li)	19±3	Hongyu	1986	1.0	?		19±3
1090	^{51}V(n,n') ^{51}V	2704(15/2$^-$)→1609(11/2$^-$),p	14.7	125	V:Ø30×Ø20×50,120g,+/+	HPGe	59±5	Hlavac-2	1997	1.0	1.0		59±5
			14.1	30-150	V:Ø30×Ø26×70 +/+	Ge(Li)	30.4±2.7*	Murata	1997	1.0	1.0		(s) 30.4±2.7*
			14.9	30-140	V:Ø30×30, 130g, +/+	Ge(Li)	58±3	Yiming	1988	1.0	1.0		58±3
			14.9	90	V:Ø30×30, +/+	Ge(Li)	66±5	Hongyu	1986	1.0	?		66±5
1121	^{51}V(n,d) ^{50}Ti	2675(4$^+$)→1554(2$^+$), p	14.7	125	V:Ø30×Ø20×50,120g,+/+	HPGe	14±2	Hlavac-2	1997	1.0	1.0		14±2
			14.9	30-140	V:Ø30×30, 130g, +/+	Ge(Li)	9±3	Yiming	1988	1.0	1.0		9±3
			14.9	90	V:Ø30×30, +/+	Ge(Li)	14±3	Hongyu	1986	1.0	?		14±3
1174	^{51}V(n,2n) ^{50}V	1561(2$^+$)→388(2$^+$), p	14.7	125	V:Ø30×Ø20×50,120g,+/+	HPGe	21±3	Hlavac-2	1997	1.0	1.0		21±3
			14.9	30-140	V:Ø30×30, 130g, +/+	Ge(Li)	18±1	Yiming	1988	1.0	1.0		18±1
			14.9	90	V:Ø30×30, +/+	Ge(Li)	24±2	Hongyu	1986	1.0	?		24±2
1437	^{51}V(n,n') ^{51}V	unasigned	14.7	125	V:Ø30×Ø20×50,120g,+/+	HPGe	24±3	Hlavac-2	1997	1.0	1.0		24±3
			14.9	30-140	V:Ø30×30, 130g, +/+	Ge(Li)	15±1	Yiming	1988	1.0	1.0		15±1
			14.9	90	V:Ø30×30, +/+	Ge(Li)	23±3	Hongyu	1986	1.0	?		23±3
1494	^{51}V(n,n') ^{51}V	1813(9/2$^-$)→319(5/2$^-$), p	14.7	125	V:Ø30×Ø20×50,120g,+/+	HPGe	13±2	Hlavac-2	1997	1.0	1.0		13±2
			14.9	30-140	V:Ø30×30, 130g, +/+	Ge(Li)	16±1	Yiming	1988	1.0	1.0		16±1
			14.9	90	V:Ø30×30. +/+	Ge(Li)	27±4	Hongyu	1986	1.0	?		27±4
1554	^{51}V(n.d) ^{50}Ti	1554(2$^+$)→0(0$^+$). p	14.7	125	V:Ø30×Ø20×50.120g.+/+	HPGe	32±3	Hlavac-2	1997	1.0	1.0		32±3
			14.9	30-140	V:Ø30×30. 130g. +/+	Ge(Li)	28±2	Yiming	1988	1.0	1.0		28±2

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
			14.9	90	V:∅30×30, +/+	Ge(Li)	34±4	Hongyu	1986	1.0	?		34±4
1609	^{51}V(n,n')^{51}V	1609(11/2$^-$)→0(7/2$^-$), p	14.7	125	V:∅30×∅20×50,120g,+/+	HPGe	214±15	Hlavac-2	1997	1.0	1.0		214±15
			14.1	30-150	V:∅30×∅26×70 +/+	Ge(Li)	118±10*	Murata	1997	1.0	1.0		(s) 118±10*
			14.9	30-140	V:∅30×30, 130g, +/+	Ge(Li)	204±11	Yiming	1988	1.0	1.0		204±11
			14.9	90	V:∅30×30, +/+	Ge(Li)	232±17	Hongyu	1986	1.0	?		232±17
1777	^{51}V(n,n')^{51}V	3386(?)→1609(11/2$^-$), p	14.7	125	V:∅30×∅20×50,120g,+/+	HPGe	48±3	Hlavac-2	1997	1.0	1.0		48±3
			14.9	30-140	V:∅30×30, 130g, +/+	Ge(Li)	23±1	Yiming	1988	1.0	1.0		23±1
			14.9	90	V:∅30×30, +/+	Ge(Li)	27±5	Hongyu	1986	1.0	?		27±5
1813	^{51}V(n,n')^{51}V	1813(9/2$^-$)→0(7/2$^-$), p	14.7	125	V:∅30×∅20×50,120g,+/+	HPGe	72±6	Hlavac-2	1997	1.0	1.0		72±6
			14.1	30-150	V:∅30×∅26×70 +/+	Ge(Li)	38±3.5*	Murata	1997	1.0	1.0		(s) 38±3.5*
			14.9	30-140	V:∅30×30, 130g, +/+	Ge(Li)	61±4	Yiming	1988	1.0	1.0		61±4
			14.9	90	V:∅30×30, +/+	Ge(Li)	75±6	Hongyu	1986	1.0	?		75±6
2004	^{51}V(n,n')^{51}V	3615(?)→1609(11/2$^-$), p	14.7	125	V:∅30×∅20×50,120g,+/+	HPGe	13±3	Hlavac-2	1997	1.0	1.0		13±3
			14.9	30-140	V:∅30×30, 130g, +/+	Ge(Li)	8±1	Yiming	1988	1.0	1.0		8±1
			14.9	90	V:∅30×30, +/+	Ge(Li)	22±5	Hongyu	1986	1.0	?		22±5
2334	^{51}V(n,n')^{51}V	?3204→928(3/2$^-$), p	14.7	125	V:∅30×∅20×50,120g,+/+	HPGe	15±3	Hlavac-2	1997	1.0	1.0		15±3
			14.9	30-140	V:∅30×30, 130g, +/+	Ge(Li)	4±1	Yiming	1988	1.0	1.0		(s) 4±1
			14.9	90	V:∅30×30, +/+	Ge(Li)	18±2	Hongyu	1986	1.0	?		18±2
24-Chromium (50 - 4.3%, 52 - 83.8%, 53 - 9.6%, 54 - 2.4%)													
648	Cr(n,n'+2n)^{52}Cr	3415(4$^+$)→2768(4$^+$), p	14.1	30-150	Cr:∅30×∅26×70 +/+	Ge(Li)	5.1±0.8*	Murata	1997	1.0	1.0		(s) 5.1±0.8*
			14.7	56	Cr:80×80×2.2, 89.5g, +/+	HPGe	62±4	Hlavac-1	1993	1.0	1.0		62±4
			14.1	55,90	Cr:∅??×20, +/+	Ge(Li)	67±10	Grenier	1974	1.0	1.0		67±10
705	Cr(n,n'+2n)^{52}Cr	3472(?$^+$)→2768(4$^+$), p	14.7	56	Cr:80×80×2.2, 89.5g, +/+	HPGe	29±3	Hlavac-1	1993	1.0	1.0		29±3
744	Cr(n,n'+2n)^{52}Cr	3114(6$^+$)→2370(4$^+$), p	14.1	30-150	Cr:∅30×∅26×70 +/+	Ge(Li)	16.6±1.7*	Murata	1997	1.0	1.0		(s) 16.6±1.7*
			14.7	56	Cr:80×80×2.2, 89.5g, +/+	HPGe	66±6	Hlavac-1	1993	1.0	1.0		66±6
			14.8	125	Cr_2O_3:∅30×40, +/+	Ge(Li)	128±43	Yamamoto	1978	1.0	1.0		128±43
			14.1	55,90	Cr:∅??×20, +/+	Ge(Li)	68±9	Grenier	1974	1.0	1.0		68±9
749	Cr(n,2n)^{51}Cr	749(3/2$^-$)→0(7/2$^-$), p	14.7	56	Cr:80×80×2.2, 89.5g, +/+	HPGe	37±4	Hlavac-1	1993	1.0	1.0		37±4
			14.6	42-158	^{52}Cr:∅35×65, 120g, +/+	HPGe	35±2	Oblozinsky	1988	1.0	1.0		35±2
935	Cr(n,n'+2n)^{52}Cr	2370(4$^+$)→1434(2$^+$), p	14.1	30-150	Cr:∅30×∅26×70 +/+	Ge(Li)	67±5.9*	Murata	1997	1.0	1.0		(s) 67±5.9*
			14.7	56	Cr:80×80×2.2, 89.5g, +/+	HPGe	218±13	Hlavac-1	1993	1.0	1.0		218±13
			14.2	30-150	Cr:∅60×12, +/-	NaI(Tl)	221±31	Abbondano	1973	1.0	1.0		221±31
			14.8	125	Cr_2O_3:∅30×40, +/+	Ge(Li)	211±26	Yamamoto	1978	1.0	1.0		211±26
			14.1	55,90	Cr:∅??×20, +/+	Ge(Li)	195±20	Grenier	1974	1.0	1.0		195±20
			14.4	90	Cr:∅72×25, 390g, +/+	NaI(Tl)	151±39	McKinney	1972	0.74	1.15		129±33
1006	Cr(n,n'+2n)^{53}Cr	1006(5/2$^-$)→0(3/2$^-$), p	14.7	56	Cr:80×80×2.2, 89.5g, ?/?	HPGe	25±4	Hlavac-1	1993	1.0	1.0		25±4
			14.1	55,90	Cr:∅??×20, +/+	Ge(Li)	15±5	Grenier	1974	1.0	1.0		15±5
1164	Cr(n,2n)^{51}Cr	1164(9/2$^-$)→0(7/2$^-$),p	14.7	56	Cr:80×80×2.2, 89.5g, +/+	HPGe	33±4	Hlavac-1	1993	1.0	1.0		33±4
			14.6	42-158	^{52}Cr:∅35×65, 120g, +/+	HPGe	30±3	Oblozinsky	1988	1.0	1.0		30±3
1246	Cr(n,n'+2n)^{52}Cr	3616(5$^+$)→2370(4$^+$), p	14.7	56	Cr:80×80×2.2, 89.5g, +/+	HPGe	30±4	Hlavac-1	1993	1.0	1.0		30±4
			14.1	55,90	Cr:∅??×20, +/+	Ge(Li)	24±5	Grenier	1973	1.0	1.0		24±5
1290	Cr(n,n'+2n)^{53}Cr	1290(7/2$^-$)→0(3/2$^-$), p	14.7	56	Cr:80×80×2.2, 89.5g, +/+	HPGe	24±3	Hlavac-1	1993	1.0	1.0		24±3
			14.1	55,90	Cr:∅??×20, +/+	Ge(Li)	29±8	Grenier	1974	1.0	1.0		29±8
1334	Cr(n,n'+2n)^{52}Cr	2768(4$^+$)→1434(2$^+$), p	14.1	30-150	Cr:∅30×∅26×70 +/+	Ge(Li)	110±10*	Murata	1997	1.0	1.0		(s) 110±10*
			14.7	56	Cr:80×80×2.2, 89.5g, +/+	HPGe	191±12	Hlavac-1	1993	1.0	1.0		191±12
			14.2	30-150	Cr:∅60×12, +/-	NaI(Tl)	239±36	Abbondano	1973	1.0	1.0		239±36
			14.8	125	Cr_2O_3:∅30×40, +/+	Ge(Li)	173±29	Yamamoto	1978	1.0	1.0		173±29
			14.1	55,90	Cr:∅??×20, +/+	Ge(Li)	158±16	Grenier	1974	1.0	1.0		158±16

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
			14.4	90	Cr:Ø72×25, 390g, ?/?	NaI(Tl)	45±19	McKinney	1972	0.74	1.18		(s) 39.3±17
1434	Cr(n,n'+2n) ^{52}Cr	1434(2$^+$)→0(0$^+$), p	14.1	30-150	Cr:Ø30×Ø26×70 +/+	Ge(Li)	453±39*	Murata	1997	1.0	1.0		(s) 453±39*
			14.7	56	Cr:80×80×2.2, 89.5g, +/+	HPGe	695±28	Hlavac-1	1993	1.0	1.0		695±28
			14.2	30-150	Cr:Ø60×12, +/-	NaI(Tl)	757±56	Abbondano	1973	1.0	1.0		757±56
			14.8	125	Cr_2O_3:Ø30×40, +/+	Ge(Li)	738±52	Yamamoto	1978	1.0	1.0		738±52
			14.1	55,90	Cr:Ø??×20, +/+	Ge(Li)	658±53	Grenier	1974	1.0	1.0		658±53
			14.4		Ø58×?, +/+	Ge(Li)	727±100	Breunlich	1972	0.99	?		720±99
			14.4	90	Cr:Ø72×25, 390g, ?/?	NaI(Tl)	442±65	McKinney	1972	0.74	1.12		366±54
1531	Cr(n,n'+2n) ^{52}Cr	2965(2$^+$)→1434(2$^+$), p	14.1	30-150	Cr:Ø30×Ø26×70 +/+	Ge(Li)	29±2.2*	Murata	1997	1.0	1.0		(s) 29±2.2*
			14.7	56	Cr:80×80×2.2, 89.5g, +/+	HPGe	45±4	Hlavac-1	1993	1.0	1.0		45±4
			14.2	30-150	Cr:Ø60×12, +/-	NaI(Tl)	74±23	Abbondano	1973	1.0	1.0		74±23
			14.1	55,90	Cr:Ø??×20, +/+	Ge(Li)	44±8	Grenier	1974	1.0	1.0		44±8
			14.4	90	Cr:Ø72×25, 390g, +/+	NaI(Tl)	48±15	McKinney	1972	0.74	?		35.5±11
1728	Cr(n,n'+2n) ^{52}Cr	3162(2$^+$)→1434(2$^+$), p	14.1	30-150	Cr:Ø30×Ø26×70 +/+	Ge(Li)	29±3.0*	Murata	1997	1.0	1.0		(s) 29±3.0*
			14.7	56	Cr:80×80×2.2, 89.5g, +/+	HPGe	33±4	Hlavac-1	1993	1.0	1.0		33±4
			14.1	55,90	Cr:Ø??×20, +/+	Ge(Li)	33±8	Grenier	1974	1.0	1.0		33±8
24-Chromium -52													
648	^{52}Cr(n,n') ^{52}Cr	3415(4$^+$)→2768(4$^+$), p	14.6	42-158	^{52}Cr:Ø35×65, 120g, +/+	HPGe	70±4	Oblozinsky	1988	1.0	1.0		70±4
705	^{52}Cr(n,n') ^{52}Cr	3472(?$^+$)→2768(4$^+$), p	14.6	42-158	^{52}Cr:Ø35×65, 120g, +/+	HPGe	42±3	Oblozinsky	1988	1.0	1.0		42±3
744	^{52}Cr(n,n') ^{52}Cr	3114(6$^+$)→2370(4$^+$), p	14.6	42-158	^{52}Cr:Ø35×65, 120g, +/+	HPGe	71±4	Oblozinsky	1988	1.0	1.0		71±4
749	^{52}Cr(n,2n) ^{51}Cr	749(3/2$^-$)→0(7/2$^-$), p	14.6	42-158	^{52}Cr:Ø35×65, 120g, +/+	HPGe	42±2	Oblozinsky	1988	1.0	1.0		35±2
935	^{52}Cr(n,n') ^{52}Cr	2370(4$^+$)→1434(2$^+$), p	14.6	42-158	^{52}Cr:Ø35×65, 120g, +/+	HPGe	237±9	Oblozinsky	1988	1.0	1.0		237±9
1164	^{52}Cr(n,2n) ^{51}Cr	1164(9/2$^-$)→0(7/2$^-$), p	14.6	42-158	^{52}Cr:Ø35×65, 120g, +/+	HPGe	30±3	Oblozinsky	1988	1.0	1.0		30±3
1246	^{52}Cr(n,n') ^{52}Cr	3616(5$^+$)→2370(4$^+$), p	14.6	42-158	^{52}Cr:Ø35×65, 120g, +/+	HPGe	39±4	Oblozinsky	1988	1.0	1.0		39±4
1334	^{52}Cr(n,n') ^{52}Cr	2768(4$^+$)→1434(2$^+$), p	14.6	42-158	^{52}Cr:Ø35×65, 120g, +/+	HPGe	205±8	Oblozinsky	1988	1.0	1.0		205±8
1434	^{52}Cr(n,n') ^{52}Cr	1434(2$^+$)→0(0$^+$), p	14.6	42-158	^{52}Cr:Ø35×65, 120g, +/+	HPGe	783±30	Oblozinsky	1988	1.0	1.0		783±30
1531	^{52}Cr(n,n') ^{52}Cr	2965(2$^+$)→1434(2$^+$), p	14.6	42-158	^{52}Cr:Ø35×65, 120g, +/+	HPGe	40±3	Oblozinsky	1988	1.0	1.0		40±3
1728	^{52}Cr(n,n') ^{52}Cr	3162(2$^+$)→1434(2$^+$), p	14.6	42-158	^{52}Cr:Ø35×65, 120g, +/+	HPGe	26±4	Oblozinsky	1988	1.0	1.0		26±4
25-Manganese (55 - 100%)													
126	^{55}Mn(n,n')^{55}Mn	126(7/2$^-$)→0(5/2$^-$), p	14.7	125	Mn:Ø84×12.5, +/+	HPGe	383±27	Hlavac-2	1997	1.0	1.0		383±27
156	^{55}Mn(n,2n)^{54}Mn	156(4$^+$)→0(3$^+$), p	14.7	125	Mn:Ø84×12.5, +/+	HPGe	542±38	Hlavac-2	1997	1.0	1.0		542±38
212	^{55}Mn(n,2n)^{54}Mn	368(5$^+$)→156(4$^+$), p	14.7	125	Mn:Ø84×12.5, +/+	HPGe	299±19	Hlavac-2	1997	1.0	1.0		299±19
252	^{55}Mn(n,2n)^{54}Mn	408(3$^+$)→156(4$^+$), p	14.7	125	Mn:Ø84×12.5, +/+	HPGe	52±5	Hlavac-2	1997	1.0	1.0		52±5
306	^{55}Mn(n,n')^{55}Mn	1290(1/2$^-$)→984(9/2$^-$), p	14.7	125	Mn:Ø84×12.5, +/+	HPGe	26±4	Hlavac-2	1997	1.0	1.0		26±4
+ 308		1292(11/2$^-$)→984(9/2$^-$) p											
408	^{55}Mn(n,2n)^{54}Mn	408(3$^+$)→0(3$^+$), p	14.7	125	Mn:Ø84×12.5, +/+	HPGe	26±3	Hlavac-2	1997	1.0	1.0		26±3
471	^{55}Mn(n,2n)^{54}Mn	839(4$^+$)→368(5$^+$), p	14.7	125	Mn:Ø84×12.5, +/+	HPGe	66±7	Hlavac-2	1997	1.0	1.0		66±7
705	^{55}Mn(n,2n)^{54}Mn	1073(6$^+$)→368(5$^+$), p	14.7	125	Mn:Ø84×12.5, +/+	HPGe	108±8	Hlavac-2	1997	1.0	1.0		108±8
			14.1	30-150	Mn:Ø30×Ø26×7 +/+	Ge(Li)	8.6±0.3*	Murata	1997	1.0	1.0		(s) 8.6±0.3*
769	^{55}Mn(n,2n)^{54}Mn	1137(5$^+$)→368(5$^+$), p	14.7	125	Mn:Ø84×12.5, +/+	HPGe	28±4	Hlavac-2	1997	1.0	1.0		28±4
			14.1	30-150	Mn:Ø30×Ø26×7 +/+	Ge(Li)	4.3±0.2*	Murata	1997	1.0	1.0		(s) 4.3±0.2*
835	^{55}Mn(n,np)^{54}Cr	835(2$^+$)→0(0$^+$), p	14.7	125	Mn:Ø84×12.5, +/+	HPGe	83±7	Hlavac-2	1997	1.0	1.0		83±7
			14.1	30-150	Mn:Ø30×Ø26×7 +/+	Ge(Li)	5.9±0.2*	Murata	1997	1.0	1.0		(s) 5.9±0.2*
839	^{55}Mn(n,2n)^{54}Mn	839(4$^+$)→0(0$^+$), p	14.7	125	Mn:Ø84×12.5, +/+	HPGe	58±5	Hlavac-2	1997	1.0	1.0		58±5
			14.1	30-150	Mn:Ø30×Ø26×7 +/+	Ge(Li)	3.6±0.2*	Murata	1997	1.0	1.0		(s) 3.6±0.2*
858	^{55}Mn(n,n')^{55}Mn	984(9/2$^-$)→126(7/2$^-$). p	14.7	125	Mn:Ø84×12.5. +/+	HPGe	95±7	Hlavac-2	1997	1.0	1.0		95±7
			14.6	30-150	Ø30×Ø26×70. +/+	Ge	38±0.4*	Murata	1997	1.0	1.0		(s) 38±0.4*

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
			14.1	30-90	No information, +/+	NaI(Tl)	637±73	Martin	1965	1.0	1.0		(s) 637±73
1020	^{55}Mn(n,n')^{55}Mn	$2312(13/2^-)\rightarrow1292(11/2^-)$,p	14.7	125	Mn:∅84×12.5, +/+	HPGe	67±6	Hlavac-2	1997	1.0	1.0		67±6
			14.6	30-150	∅30×∅26×70, +/+	Ge	18±0.4*	Murata	1997	1.0	1.0		(s) 18±0.4*
1164	^{55}Mn(n,n')^{55}Mn	$1290(1/2^-)\rightarrow984(9/2^-)$,p	14.7	125	Mn:∅84×12.5, +/+	HPGe	107±9	Hlavac-2	1997	1.0	1.0		107±9
+1166		$1292(11/2^-)\rightarrow984(9/2^-)$,p											
			14.1	30-150	Mn:∅30×∅26×7 +/+	Ge(Li)	38±0.4*	Murata	1997	1.0	1.0		(s) 38±0.4*
1414	?	?	14.1	30-150	Mn:∅30×∅26×7 +/+	Ge(Li)	2.2±0.3*	Murata	1997	1.0	1.0		(s) 2.2±0.3*
1509	^{55}Mn(n,2n)^{54}Mn	$1509(2^+)\rightarrow0(3^+)$, p	14.1	30-150	Mn:∅30×∅26×7 +/+	Ge(Li)	0.5±0.3*	Murata	1997	1.0	1.0		(s) 0.5±0.3*
1520	?		14.1	30-150	Mn:∅30×∅26×7 +/+	Ge(Li)	5.0±0.3*	Murata	1997	1.0	1.0		(s) 5.0±0.3*
1528	^{55}Mn(n,n')^{55}Mn	$1528(3/2^-)\rightarrow0(5/2^-)$, p	14.7	125	Mn:∅84×12.5, +/+	HPGe	48±4	Hlavac-2	1997	1.0	1.0		48±4
			14.1	30-150	Mn:∅30×∅26×7 +/+	Ge(Li)	18±0.4*	Murata	1997	1.0	1.0		(s) 18±0.4*
1743	?	?	14.1	30-150	Mn:∅30×∅26×7 +/+	Ge(Li)	1.5±0.3*	Murata	1997	1.0	1.0		(s) 1.5±0.3*
1765	?	$?1885(3/2^-)\rightarrow126(5/2^-)$, p	14.1	30-150	Mn:∅30×∅26×7 +/+	Ge(Li)	6.6±0.4*	Murata	1997	1.0	1.0		(s) 6.6±0.4*
26-Iron (54 - 5.8%, 56 - 91.6%, 57 - 2.2%, 58 -0.3%)													
411	^{56}Fe(n,2n)^{55}Fe	$411(1/2^-)\rightarrow0(3/2^-)$, p	14.9	125	^{56}Fe:∅?×?, 56g, +/+	Ge(Li)	45±6	Hongyu	1986	1.0	1.0		45±6
			14.8	125	Fe:∅30×40, +/+	Ge(Li)	35±13	Yamamoto	1978	1.0	1.0		35±13
			14.8	45-135	Fe:∅100×∅??, +/-	Ge(Li)	58±6.3	Degtyarev	1977	1.0	1.0		58±6.3
			14.2	55	Fe:∅30×40, +/+	Ge(Li)	67±10	Hino	1976	1.0	1.0		67±10
			16.2	55	Fe:∅85×10, +/+	Ge(Li)	25±5	Korkalchuk	1974	1.15	1.0		28.8±6.8
476	^{56}Fe(n,2n)^{55}Fe	$1407(7/2^-)\rightarrow931(5/2^-)$, p	14.9	90	Fe:∅30×30, +/+	Ge(Li)	55±7	Hongyu	1986	1.0	?		55±7
			14.8	125	Fe:∅30×40, +/+	Ge(Li)	55±18	Yamamoto	1978	1.0	1.0		55±18
			14.8	45-135	Fe:∅100×∅??, +/-	Ge(Li)	54±6.3	Degtyarev	1977	1.0	1.0		54±6.3
			16.2	55	Fe:∅85×10, +/+	Ge(Li)	20±4	Korkalchuk	1974	1.15	1.0		23.0±4.6
847	Fe(n,n'+2n)^{56}Fe	$847(2^+)\rightarrow0(0^+)$, p	14.1	30-150	Fe:∅30×∅26×7 +/+	Ge(Li)	521±45*	Murata	1997	1.0	1.0		(s) 521±45*
			15.4	90	∅190×∅110×?, +/+	Ge(Li)	715±52	Lashuk	1994	0.85	1.25	+129	828±55
			14.2	55	Fe:∅120×15, +/+	HPGe	679±40	Jinqiang	1988	1.0	1.0	-43	636±40
			14.9	90	Fe:∅30×30, +/+	Ge(Li)	822±57	Hongyu	1986	1.0	1.25	+57	996±71
			14.9	93	No Information, +/+	NaI(Tl)	493±49	Zong-Ren	1979	1.0	1.25	+57	619±61
			14.2	90-130	∅44×6,∅31×∅25×32,+/+	NaI(Tl)	700±85	Drake	1978	1.0	1.0	-43	657±85
			14.8	125	Fe:∅30×40, +/+	Ge(Li)	1084±94	Yamamoto	1978	1.0	1.0	+43	1127±94
			14.8	45-135	Fe:∅100×∅??, +/-	Ge(Li)	716±75	Degtyarev	1977	1.0	1.0	+43	759±75
			14.0	0-180	∅60×∅54, +/-	NaI(Tl)	840±90	Bezotosny	1976	1.0	1.0	-72	768±90
			14.2	55	Fe:∅30×40, +/+	Ge(Li)	804±124	Hino	1976	1.0	1.0	-43	804±124
			14.2	90,122	No Information, +/+	NaI(Tl)	824±88	Arthur	1975	1.0	1.0	-43	781±88
			13.6	125	Fe:∅??∅??×9.9, +/+	Ge(Li)	544±54	Orphan	1975	1.0	1.0	-129	415±54
			16.2	55	Fe:∅85×10, +/-	Ge(Li)	392±78	Korkalchuk	1974	1.15	1.0	+243	694±90
			14.1	30-150	Fe:∅20×25, +/-	Ge(Li)	806±81	Lachkar	1974	1.0	1.0	-57	806±81
			14.2	30-150	Fe:∅60×12, +/-	NaI(Tl)	721±76	Abbondano	1973	1.0	1.0	-43	678±76
			14.8	90	Cyllinder ?? , ?/?	NaI(Tl)	1082±216	Nellis	1971	1.0	1.25	+43	1280±270
			13.4	125	Fe:∅240×∅120×6, +/+	Ge(Li)	490±60	Voss	1971	1.0	1.0	-157	333±60
			14.1	90	Fe:∅100×20, +/+	Ge(Li)	472±28	Clayeux	1969	1.0	1.25	-57	483±35
			15	80	Fe:∅150×30, +/+	Ge(Li)	857±129	Joensson	1968	0.91	1.25	+72	969±147
			14.7	90	Fe ∅38.1×76.2, +/+	NaI(Tl)	715±73	Engesser	1967	1.0	1.25	+29	815±91
			14		∅60×30, +/+	NaI(Tl)	1228±150	Bezotosny	1966	1.0	?	-72	1084±150
			14.1	30-90	No information, +/+	NaI(Tl)	1138±135	Martin	1965	1.0	1.0	-57	1081±135
931	^{56}Fe(n,2n)^{55}Fe	$931(5/2^-)\rightarrow0(3/2^-)$, p	14.1	30-150	Fe:∅30×∅26×7 +/+	Ge(Li)	64±6.0*	Murata	1997	1.0	1.0		(s) 64±6.0*
			15.4	90	∅190×∅110×?, +/+	Ge(Li)	103±12	Lashuk	1994	0.85	?		88.6±10
			14.9	90	Fe:∅30×30, +/+	Ge(Li)	147±6	Hongyu	1986	1.0	?		147±6

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
			14.9	93	No Information, +/+	NaI(Tl)	309±31	Zong-Ren	1979	1.0	?		309±31
			14.8	125	Fe:Ø30×40, +/+	Ge(Li)	134±20	Yamamoto	1978	1.0	1.0		134±20
			14.8	45-135	Fe:Ø100×Ø??, +/-	Ge(Li)	80±10	Degtyarev	1977	1.0	1.0		80±10
			13.6	125	Fe:Ø??Ø??×9.9, +/+	Ge(Li)	70±11	Orphan	1975	1.0	1.0		70±11
			16.2	55	Fe:Ø85×10, +/-	Ge(Li)	84±16	Korkalchuk	1974	1.15	1.0		96.7±18
			14.2	55	Fe:Ø30×40, +/+	Ge(Li)	10±4	Hino	1976	1.0	1.0		(s) 10±4
			14.1	90	Fe:Ø100×20, +/+	Ge(Li)	54±4	Clayeux	1969	1.0	?		54±4
			15	80	Fe:Ø150×30, +/+	Ge(Li)	50±8	Joensson	1968	0.91	?		45.5±7.3
			14.7	90	Fe:Ø38.1×76.2, +/+	NaI(Tl)	147±49	Engesser	1967	1.0	?		147±49
1038	Fe(n,n'+2n) ^{56}Fe	3123(4$^+$)→2085(4$^+$), p	14.1	30-150	Fe:Ø30×Ø26×7 +/+	Ge(Li)	54±5.3*	Murata	1997	1.0	1.0		(s) 54±5.3*
			15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	28±3	Lashuk	1994	0.85	?		23.8±2.6
			14.2	55	Fe:Ø120×15, +/+	HPGe	70.4±6.3	Jinqiang	1988	1.0	1.0		70.4±6.3
			14.9	90	Fe:Ø30×30, +/+	Ge(Li)	60±6	Hongyu	1986	1.0	?		60±6
			14.8	125	Fe:Ø30×40, +/+	Ge(Li)	60±10	Yamamoto	1978	1.0	1.0		60±10
			14.8	45-135	Fe:Ø100×Ø??, +/-	Ge(Li)	44±5	Degtyarev	1977	1.0	1.0		44±5
			14.2	55	Fe:Ø30×40, +/+	Ge(Li)	50±9	Hino	1976	1.0	1.0		50±9
			13.6	125	Fe:Ø??Ø??×9.9, +/+	Ge(Li)	41±6	Orphan	1975	1.0	1.0		41±6
			12.9	125	Fe:Ø240×Ø120×6, +/+	Ge(Li)	42±6	Voss	1971	1.0	1.0		42±6
			14.7	90	Fe:Ø38.1×76.2, +/+	NaI(Tl)	79±16	Engesser	1967	1.0	?		79±16
1238	Fe(n,n'+2n) ^{56}Fe	2085(4$^+$)→847(2$^+$), p	14.1	30-150	Fe:Ø30×Ø26×7 +/+	Ge(Li)	310±27*	Murata	1997	1.0	1.0		(s) 310±27*
			15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	196±21	Lashuk	1994	0.85	1.33		222±24
			14.0	90	Fe:Ø30×30, +/+	NaI(Tl)	362±25	Drosg	1991	1.0	1.33		481±33
			14.2	55	Fe:Ø120×15, +/+	HPGe	329±19	Jinqiang	1988	1.0	1.0		329±19
			14.9	90	Fe:Ø30×30, +/+	Ge(Li)	373±26	Hongyu	1986	1.0	1.33		496±35
			14.2	90-130	Ø44×6,Ø31×Ø25×32,+/+	NaI(Tl)	376±45	Drake	1978	1.0	1.0		376±45
			14.8	125	Fe:Ø30×40, +/+	Ge(Li)	502±44	Yamamoto	1978	1.0	1.0		502±44
			14.8	45-135	Fe:Ø100×Ø??, +/-	Ge(Li)	239±25	Degtyarev	1977	1.0	1.0		239±25
			14.0	0-180	Ø60×Ø54, +/-	NaI(Tl)	470±50	Bezotosny	1976	1.0	1.0		470±50
			14.2	55	Fe:Ø30×40, +/+	Ge(Li)	276±43	Hino	1976	1.0	1.0		276±43
			14.2	90,122	No Information, +/+	NaI(Tl)	427±52	Arthur	1975	1.0	1.0		427±52
			13.6	125	Fe:Ø??Ø??×9.9, +/+	Ge(Li)	354±35	Orphan	1975	1.0	1.0		354±35
			16.2	55	Fe:Ø85×10, +/-	Ge(Li)	220±44	Korkalchuk	1974	1.15	1.0		253±51
			14.1	30-150	Fe:Ø20×25, +/-	Ge(Li)	357±71	Lachkar	1974	1.0	1.0		357±71
			14.2	30-150	Fe:Ø60×12, +/-	NaI(Tl)	398±23	Abbondano	1973	1.0	1.0		398±23
			14.4	90	Fe:69×69×15, 565g, ?/?	NaI(Tl)	235±96	McKinney	1972	1.0	1.33		313±128
			14.8	90	Cyllider ?? , ?/?	NaI(Tl)	716±143	Nellis	1971	1.0	1.33		952±190
			13.2	125	Fe:Ø240×Ø120×6, +/+	Ge(Li)	278±34	Voss	1971	1.0	1.0		278±34
			14.1	90	Fe:Ø100×20, +/+	Ge(Li)	276±18	Clayeux	1969	1.0	1.33		367±24
			15	80	Fe:Ø150×30, +/+	Ge(Li)	246±37	Joensson	1968	0.91	1.33		298±45
			14.7	90	Fe:Ø38.1×76.2, +/+	NaI(Tl)	289±29	Engesser	1967	1.0	1.33		394±39
			14		Ø60×30, +/+	NaI(Tl)	426±55	Bezotosny	1966	1.0	1.0		426±55
1305	Fe(n,n'+2n) ^{56}Fe	3388(6$^+$)→2065(4$^+$), p	14.1	30-150	Fe:Ø30×Ø26×7 +/+	Ge(Li)	71±6.7*	Murata	1997	1.0	1.0		(s) 71±6.7*
			15.4	90	Ø190×Ø110×?, +/+	Ge(Li)	53±8	Lashuk	1994	0.85	?		45.1±6.8
			14.9	90	Fe:Ø30×30, +/+	Ge(Li)	58±6	Hongyu	1986	1.0	?		58±6
			14.8	125	Fe:Ø30×40, +/+	Ge(Li)	113±13	Yamamoto	1978	1.0	1.0		113±13
			14.8	45-135	Fe:Ø100×Ø??, +/-	Ge(Li)	73±7.5	Degtyarev	1977	1.0	1.0		73±7.5
			14.2	55	Fe:Ø30×40, +/+	Ge(Li)	80±13	Hino	1976	1.0	1.0		80±13
			13.6	125	Fe:Ø??Ø??×9.9, +/+	Ge(Li)	77±8	Orphan	1975	1.0	1.0		77±8

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction		Corrected σ
			15	80	Fe:∅150×30, +/+	Ge(Li)	65±20	Joensson	1968	0.91	?	65±20
1317	^{56}Fe(n,2n)^{55}Fe	1317(7/2$^-$)→0(3/2$^-$), p	14.1	30-150	Fe:∅30×∅26×7 +/+	Ge(Li)	41±4.2*	Murata	1997	1.0	1.0	(s) 41±4.2*
			15.4	90	∅190×∅110×?, +/+	Ge(Li)	64±8	Lashuk	1994	0.85	?	54.4±6.8
			14.9	90	Fe:∅30×30, +/+	Ge(Li)	77±8	Hongyu	1986	1.0	?	77±8
			14.8	45-135	Fe:∅100×∅??, +/-	Ge(Li)	63±6.3	Degtyarev	1977	1.0	1.0	63±6.3
			13.6	125	Fe:∅??∅??×9.9, +/+	Ge(Li)	29±6	Orphan	1975	1.0	1.0	29±6
			16.2	55	Fe:∅85×10, +/-	Ge(Li)	68±14	Korkalchuk	1974	1.15	1.0	78.2±16
			14.1	90	Fe:∅100×20, +/+	Ge(Li)	106±8	Clayeux	1969	1.0	?	106±8
			15	80	Fe:∅150×30, +/+	Ge(Li)	58±9	Joensson	1968	0.91	?	58±9
			14.7	90	Fe:∅38.1×76.2, +/+	NaI(Tl)	93±31	Engesser	1967	1.0	?	93±31
			14.8	125	Fe:∅30×40, +/+	Ge(Li)	80±10	Yamamoto	1978	1.0	1.0	80±10
1409	^{56}Fe(n,2n)^{55}Fe	1409(7/2$^-$)→0(3/2$^-$), p	14.1	30-150	Fe:∅30×∅26×7 +/+	Ge(Li)	30±3.4*	Murata	1997	1.0	1.0	(s) 30±3.4*
			15.4	90	∅190×∅110×?, +/+	Ge(Li)	64±8	Lashuk	1994	0.85	?	54.4±6.8
			14.9	90	Fe:∅30×30, +/+	Ge(Li)	55±6	Hongyu	1986	1.0	?	55±6
			14.8	125	Fe:∅30×40, +/+	Ge(Li)	84±10	Yamamoto	1978	1.0	1.0	84±10
			14.8	45-135	Fe:∅100×∅??, +/-	Ge(Li)	38±3.8	Degtyarev	1977	1.0	1.0	38±3.8
			13.6	125	Fe:∅??∅??×9.9, +/+	Ge(Li)	33±7	Orphan	1975	1.0	1.0	33±7
			16.2	55	Fe:∅85×10, +/-	Ge(Li)	21±4	Korkalchuk	1974	1.15	1.0	24.2±4.6
			15	80	Fe:∅150×30, +/+	Ge(Li)	35±5	Joensson	1968	0.91	?	31.9±4.6
1671	Fe(n,n'+2n)^{56}Fe	3756(6$^+$)→2085(4$^+$), p	14.1	30-150	Fe:∅30×∅26×7 +/+	Ge(Li)	40±4.3*	Murata	1997	1.0	1.0	(s) 30±4.3*
			15.4	90	∅190×∅110×??, +/+	Ge(Li)	22±3	Lashuk	1994	0.85	?	18.7±2.6
			14.9	90	Fe:∅30×30, +/+	Ge(Li)	40±5	Hongyu	1986	1.0	?	40±5
			14.8	125	Fe:∅30×40, +/+	Ge(Li)	59±9	Yamamoto	1978	1.0	1.0	59±9
			14.0	0-180	Fe:∅70, +/-	NaI(Tl)	40±6	Bezotosny	1976	1.0	1.0	40±6
			14.8	45-135	Fe:∅100×∅??, +/-	Ge(Li)	15±5	Degtyarev	1977	1.0	1.0	15±5
			15	80	Fe:∅150×30, +/+	Ge(Li)	24±6	Joensson	1968	0.91	?	21.8±5.5
			14.7	90	Fe:∅38.1×76.2, +/+	NaI(Tl)	25±5	Engesser	1967	1.0	?	25±5
1811	Fe(n,n'+2n)^{56}Fe	2658(2$^+$)→847(2$^+$), p	14.1	30-150	Fe:∅30×∅26×7 +/+	Ge(Li)	44±4.6*	Murata	1997	1.0	1.0	(s) 44±4.6*
			15.4	90	∅190×∅110×?, +/+	Ge(Li)	72±9	Lashuk	1994	0.85	?	61.2±7.7
			14.2	55	Fe:∅120×15, +/+	HPGe	46±5	Jinqiang	1988	1.0	1.0	46±5
			14.9	90	Fe:∅30×30, +/+	Ge(Li)	68±8	Hongyu	1986	1.0	?	68±8
			14.8	125	Fe:∅30×40, +/+	Ge(Li)	92±10	Yamamoto	1978	1.0	1.0	92±10
			14.8	45-135	Fe:∅100×∅??, +/-	Ge(Li)	50±5	Degtyarev	1977	1.0	1.0	50±5
			14.0	0-180	∅60, +/-	NaI(Tl)	70±7	Bezotosny	1976	1.0	1.0	70±7
			13.6	125	Fe:∅??∅??×9.9, +/+	Ge(Li)	77±8	Orphan	1975	1.0	1.0	77±8
			13.1	125	Fe:∅240×∅120×6, +/+	Ge(Li)	38±6	Voss	1971	1.0	1.0	38±6
			14.1	90	Fe:∅100×20, +/+	Ge(Li)	48±5	Clayeux	1969	1.0	?	48±5
			15	80	Fe:∅150×30, +/+	Ge(Li)	62±9	Joensson	1968	0.91	?	56.4±8.2
			14.7	90	Fe:∅38.1×76.2, +/+	NaI(Tl)	68±8	Engesser	1967	1.0	?	68±8
2113	Fe(n,n'+2n)^{56}Fe	2960(2$^+$)→847(2$^+$), p	15.4	90	∅190×∅110×?, +/+	Ge(Li)	27±3	Lashuk	1994	0.85	?	23.0±2.6
			14.9	90	Fe:∅30×30, +/+	Ge(Li)	19±5	Hongyu	1986	1.0	?	19±5
			14.8	125	Fe:∅30×40, +/+	Ge(Li)	26±14	Yamamoto	1978	1.0	1.0	26±14
			14.0	0-180	Fe:∅70, +/-	NaI(Tl)	53±7	Bezotosny	1976	1.0	1.0	53±7
			14.8	45-135	Fe:∅100×∅??, +/-	Ge(Li)	20±6.3	Degtyarev	1977	1.0	1.0	20±6.3
			14.2	55	Fe:∅30×40, +/+	Ge(Li)	28±5	Hino	1976	1.0	1.0	28±5
			13.6	125	Fe:∅??∅??×9.9, +/+	Ge(Li)	41±6	Orphan	1975	1.0	1.0	41±6
			15	80	Fe:∅150×30, +/+	Ge(Li)	16±9	Joensson	1968	0.91	?	14.6±8.2
			14.7	90	Fe:∅38.1×76.2, +/+	NaI(Tl)	68±8	Engesser	1967	1.0	?	68±8

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
2523	Fe(n,n'+2n) ^{56}Fe	3370(2$^+$)→847(2$^+$), p	15.4	90	∅190×∅110×?, +/+	Ge(Li)	15±3	Lashuk	1994	0.85	?		12.8±2.6
			14.9	90	Fe:∅30×30, +/+	Ge(Li)	17±5	Hongyu	1986	1.0	?		17±5
			14.8	125	Fe:∅30×40, +/+	Ge(Li)	45±13	Yamamoto	1978	1.0	?		45±13
			14.8	45-135	Fe:∅100×∅??, +/-	Ge(Li)	17.6±6.3	Degtyarev	1977	1.0	1.0		17.6±6.3
			14.2	55	Fe:∅30×40, +/+	Ge(Li)	6.3±3.8	Hino	1976	1.0	1.0		(s) 6.3±3.8
			13.6	125	Fe:∅??∅??×9.9, +/+	Ge(Li)	10±4	Orphan	1975	1.0	1.0		10±4
			15	80	Fe:∅150×30, +/+	Ge(Li)	21±6	Joensson	1968	0.91	?		19.1±5.5
			14.7	90	Fe:∅38.1×76.2, +/+	NaI(Tl)	25±9	Engesser	1967	1.0	?		25±9
2598	Fe(n,n'+2n) ^{56}Fe	3445(3$^+$)→847(2$^+$), p	15.4	90	∅190×∅110×?, +/+	Ge(Li)	22±3	Lashuk	1994	0.85	?		18.7±2.6
			14.9	90	Fe:∅30×30, +/+	Ge(Li)	31±6	Hongyu	1986	1.0	?		31±6
			14.8	125	Fe:∅30×40, +/+	Ge(Li)	59±14	Yamamoto	1978	1.0	1.0		59±14
			14.8	45-135	Fe:∅100×∅??, +/-	Ge(Li)	22.6±6.3	Degtyarev	1977	1.0	1.0		22.6±6.3
			14.2	55	Fe:∅30×40, +/+	Ge(Li)	50±11	Hino	1976	1.0	1.0		50±11
			13.6	125	Fe:∅??∅??×9.9, +/+	Ge(Li)	41±6	Orphan	1975	1.0	1.0		41±6
			15	80	Fe:∅150×30, +/+	Ge(Li)	24±6	Joensson	1968	0.91	?		21.8±5.5
			14.7	90	Fe:∅38.1×76.2, +/+	NaI(Tl)	46±10	Engesser	1967	1.0	?		46±10
					26-Iron 56								
212	^{56}Fe(n,p) ^{56}Mn	212→0, p	13.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	17.1±1.2	Dickens	1991	1.0	1.0		17.1±1.2
336	^{56}Fe(n,p) ^{56}Mn	336→0, p	13.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	12.2±1.0	Dickens	1991	1.0	1.0		12.2±1.0
411	^{56}Fe(n,2n) ^{55}Fe	411(1/2$^-$)→0(3/2$^-$), p	14.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	32.5±2.4	Dickens	1991	1.0	1.0	0	32.5±2.4
476	^{56}Fe(n,2n) ^{55}Fe	1407(7/2$^-$)→931(5/2$^-$), p	14.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	38.0±4.3	Dickens	1991	1.0	1.0	0	38.0±4.3
847	^{56}Fe(n,n') ^{56}Fe	847→0, p	14.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	621±29	Dickens	1991	1.0	1.0	0	621±29
931	^{56}Fe(n,2n) ^{55}Fe	931(5/2$^-$)→0(3/2$^-$), p	14.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	84.1±7.4	Dickens	1991	1.0	1.0	0	84.1±7.4
1006	^{56}Fe(n,α) ^{53}Cr	1006→0, p	14.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	13.3±1.5	Dickens	1991	1.0	1.0	0	13.3±1.5
1038	^{56}Fe(n,n') ^{56}Fe	3123→2085, p	14.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	47.1±4.3	Dickens	1991	1.0	1.0	0	47.1±4.3
1238	^{56}Fe(n,n') ^{56}Fe	2085→847, p	14.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	290±16	Dickens	1991	1.0	1.0	0	290±16
1305	^{56}Fe(n,n') ^{56}Fe	3388→2085, p	14.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	73.1±4.8	Dickens	1991	1.0	1.0	0	73.1±4.8
1317	^{56}Fe(n,2n) ^{55}Fe	1317(7/2$^-$)→0(3/2$^-$), p	14.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	53.7±5.9	Dickens	1991	1.0	1.0	0	53.7±5.9
1409	^{56}Fe(n,2n) ^{55}Fe	1409(7/2$^-$)→0(3/2$^-$), p	14.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	23.7±4.8	Dickens	1991	1.0	1.0	0	23.7±4.8
1671	^{56}Fe(n,n') ^{56}Fe	3756(6$^+$)→2085(4$^+$), p	14.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	54.5±5.6	Dickens	1991	1.0	1.0	0	54.5±5.6
1811	^{56}Fe(n,n') ^{56}Fe	2658(5$^+$)→847(2$^+$), p	14.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	37.5±4.6	Dickens	1991	1.0	1.0	0	37.5±4.6
2035	^{56}Fe(n,n') ^{56}Fe	4120(4$^+$)→2085(4$^+$), p	14.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	10.2±3.5	Dickens	1991	1.0	1.0	0	10.2±3.5
2113	^{56}Fe(n,n') ^{56}Fe	2960(2$^+$)→847(2$^+$), p	14.5	125	^{56}Fe:∅50×15, 63g, +/+	Ge(Li)	15.3±4.7	Dickens	1991	1.0	1.0	0	15.3±4.7
					26-Iron 57								
122	^{57}Fe(n,n') ^{57}Fe	137(5/2$^-$)→14(3/2$^-$), p	14.9	125	^{57}Fe:∅9×42, 7.1g, +/+	Ge(Li)	70±17	Bell	1983	1.0	1.0		70±17
353	^{57}Fe(n,n') ^{57}Fe	367(3/2$^-$)→14(3/2$^-$), p	14.9	125	^{57}Fe:∅9×42, 7.1g, +/+	Ge(Li)	54.1±6.2	Bell	1983	1.0	1.0		54.1±6.2
1061	^{57}Fe(n,n') ^{57}Fe	1198(9/2$^-$)→14(3/2$^-$), p	14.9	125	^{57}Fe:∅9×42, 7.1g, +/+	Ge(Li)	66±13	Bell	1983	1.0	1.0		66±13
1448	^{57}Fe(n,n') ^{57}Fe	2455(9/2$^-$)→1007(7/2$^-$).p	14.9	125	^{57}Fe:∅9×42, 7.1g, +/+	Ge(Li)	22±10	Bell	1983	1.0	1.0		22±10
					27-Cobalt (59 - 100%)								
112	^{59}Co(n,2n)^{58}Co	112(3$^+$)→0(2$^+$). p	14.9	30-140	Co:∅30×30. +/+	Ge(Li)	54±2	Honguy	1988	1.0	1.0		54±2
321	^{59}Co(n,2n)^{58}Co	374(5$^+$)→53(4$^+$). p	14.9	30-140	Co ∅30×30. +/+	Ge(Li)	109±5	Honguy	1988	1.0	1.0		109±5
			16.2	55	Co ∅85×10. +/+	Ge(Li)	59±2	Prokopec	1976	1.15	1.0		67.9±2.3
366	^{59}Co(n,2n)^{58}Co	366(3$^+$)→0(2$^+$) p	14.9	30-140	Co ∅30×30. +/+	Ge(Li)	54±2	Honguy	1988	1.0	1.0		54±2
			16.2	55	Co ∅85×10. +/+	Ge(Li)	32±2	Prokopec	1976	1.15	1.0		36.8±2.3
433	^{59}Co(n.2n)^{58}Co	457(4$^+$)→25(5$^+$) p	14.9	30-140	Co ∅30×30. +/+	Ge(Li)	53±2	Honguy	1988	1.0	1.0		53±2
			16.2	55	Co ∅85×10. +/+	Ge(Li)	39±3	Prokopec	1976	1.15	1.0		44.9±3.5
694	^{59}Co(n.n')^{59}Co	2153([illegible])→1459(11/2$^-$). p	14.9	30-140	Co:∅30×30. +/+	Ge(Li)	61±3	Honguy	1988	1.0	1.0		61±3

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
811	^{59}Co(n,np)^{58}Fe	811(2$^+$)→0(0$^+$), p	14.1	30-150	Co:∅30×∅26×70 +/+	Ge(Li)	13±0.3*	Murata	1997	1.0	1.0		(s) 13±0.3*
			14.9	30-140	Co:∅30×30, +/+	Ge(Li)	63±3	Honguy	1988	1.0	1.0		63±3
			16.2	55	Co:∅85×10, +/+	Ge(Li)	43±3	Prokopec	1976	1.15	1.0		49.5±3.5
989	^{59}Co(n,n')^{59}Co	2088(5/2$^-$)→1099(3/2$^-$),p	14.1	30-150	Co:∅30×∅26×70 +/+	Ge(Li)	14±0.4*	Murata	1997	1.0	1.0		(s) 14±0.4*
1051	^{59}Co(n,2n)^{58}Co	1075(6$^+$)→25(5$^+$), p	14.1	30-150	Co:∅30×∅26×70 +/+	Ge(Li)	25±0.5*	Murata	1997	1.0	1.0		(s) 25±0.5*
			14.9	30-140	Co:∅30×30, +/+	Ge(Li)	91±4	Honguy	1988	1.0	1.0		91±4
			16.2	55	Co:∅85×10, +/+	Ge(Li)	66±7	Prokopec	1976	1.15	1.0		75.6±8.1
1099	^{59}Co(n,n')^{59}Co	1099(3/2$^-$)→0(7/2$^-$), p	14.1	30-150	Co:∅30×∅26×70 +/+	Ge(Li)	19±0.5*	Murata	1997	1.0	1.0		(s) 19±0.5*
			14.9	30-140	Co:∅30×30, +/+	Ge(Li)	55±3	Honguy	1988	1.0	1.0		55±3
			16.2	55	Co:∅85×10, +/+	Ge(Li)	38±8	Prokopec	1976	1.15	1.0		43.7±9.2
1190	^{59}Co(n,n')^{59}Co	1190(9/2$^-$)→0(7/2$^-$), p	14.1	30-150	Co:∅30×∅26×70 +/+	Ge(Li)	87±0.7*	Murata	1997	1.0	1.0		(s) 87±0.7*
			14.9	30-140	Co:∅30×30, +/+	Ge(Li)	195±9	Honguy	1988	1.0	1.0		195±9
			16.2	55	Co:∅85×10, +/+	Ge(Li)	115±5	Prokopec	1976	1.15	1.0		132±5.8
1291	^{59}Co(n,n')^{59}Co	1291(3/2$^-$)→0(7/2$^-$), p	14.1	30-150	Co:∅30×∅26×70 +/+	Ge(Li)	14±0.4*	Murata	1997	1.0	1.0		(s) 14±0.4*
			14.9	30-140	Co:∅30×30, +/+	Ge(Li)	36±2	Honguy	1988	1.0	1.0		36±2
			16.2	55	Co:∅85×10, +/+	Ge(Li)	27±4	Prokopec	1976	1.15	1.0		31.1±4.6
1459	^{59}Co(n,n')^{59}Co	1459(11/2$^-$)→0(7/2$^-$), p	14.1	30-150	Co:∅30×∅26×70 +/+	Ge(Li)	85±0.7*	Murata	1997	1.0	1.0		(s) 85±0.7*
			14.9	30-140	Co:∅30×30, +/+	Ge(Li)	151±7	Honguy	1988	1.0	1.0		151±7
			16.2	55	Co:∅85×10, +/+	Ge(Li)	96±5	Prokopec	1976	1.15	1.0		110±5.8
1482	^{59}Co(n,n')^{59}Co	1482(5/2$^-$)→0(7/2$^-$), p	14.1	30-150	Co:∅30×∅26×70 +/+	Ge(Li)	18±0.5*	Murata	1997	1.0	1.0		(s) 18±0.5*
			14.9	30-140	Co:∅30×30, +/+	Ge(Li)	45±3	Honguy	1988	1.0	1.0		45±3
			16.2	55	Co:∅85×10, +/+	Ge(Li)	31±4	Prokopec	1976	1.15	1.0		35.7±4.6
1745	^{59}Co(n,n')^{59}Co	1745(7/2$^-$)→0(7/2$^-$), p	14.1	30-150	Co:∅30×∅26×70 +/+	Ge(Li)	13±0.4*	Murata	1997	1.0	1.0		(s) 13±0.4*
28-Nickel (58 - 67.8%, 60 - 26.2%, 61 - 1.3%, 62 - 3.7%, 64 - 1.2%)													
826	^{60}Ni(n,n')^{60}Ni	2159(2$^+$)→1333(2$^+$), p	14.1	30-150	Ni:∅30×∅26×70 +/+	Ge(Li)	22±2*	Murata	1997	1.0	1.0		(s) 22±2*
			14.1	90	Ni:∅??×20, +/-	Ge(Li)	22±8	Grenier	1974	1.0	?		22±8
			15	80	Ni:∅150×30, +/+	Ge(Li)	29±5	Joensson	1968	0.91	?		26±4.6
931	^{58}Ni(n,α)^{55}Fe	931(5/2$^-$)→0(3/2$^-$), p	14.1	30-150	Ni:∅30×∅26×70 +/+	Ge(Li)	16±2*	Murata	1997	1.0	1.0		(s) 16±2*
			14.8	125	Ni:∅30×40, +/+	Ge(Li)	29±9	Yamamoto	1978	1.0	1.0		29±9
1006	^{58}Ni(n,n')^{58}Ni	2460(4$^+$)→1454(2$^+$), p	14.1	30-150	Ni:∅30×∅26×70 +/+	Ge(Li)	64±5.5*	Murata	1997	1.0	1.0		(s) 64±5.5*
			14.8	125	Ni:∅30×40, +/+	Ge(Li)	88±13	Yamamoto	1978	1.0	1.0		88±13
			14.1	90	Ni:∅??×20, +/-	Ge(Li)	83±14	Grenier	1974	1.0	?		83±14
			15	80	Ni:∅150×30, +/+	Ge(Li)	59±9	Joensson	1968	0.91	?		46±8.2
1044	^{58}Ni(n,p)^{58}Co	1044(?$^+$)→0(2$^+$), p	14.8	125	Ni:∅30×40, +/+	Ge(Li)	58±11	Yamamoto	1978	1.0	1.0		58±11
1173	Ni(n,n')^{60,62}Ni	2506(4$^+$)→1333(2$^+$), p	14.1	30-150	Ni:∅30×∅26×70 +/+	Ge(Li)	66±5.7*	Murata	1997	1.0	1.0		(s) 66±5.7*
			14.8	125	Ni:∅30×40, +/+	Ge(Li)	132±18	Yamamoto	1978	1.0	1.0		132±18
			13.5	125	Ni:∅254×∅120×5.5, +/+	Ge(Li)	75±4	Voss	1975	1.0	1.0		75±4
			14.1	90	Ni:∅??×20, +/-	Ge(Li)	124±22	Grenier	1974	1.0	?		124±22
			15	80	Ni:∅150×30, +/+	Ge(Li)	34±5	Joensson	1968	1.0	?		34±5
1213	^{58}Ni(n,α)^{55}Fe	2144(5/2$^-$)→931(5/2$^-$), p	14.1	90	Ni:∅??×20, +/-	Ge(Li)	114±19	Grenier	1974	1.0	?		114±19
1223	^{58}Ni(n,np)^{57}Co	1223(9/2$^-$)→0(7/2$^-$), p	14.1	30-150	Ni:∅30×∅26×70 +/+	Ge(Li)	60±5.2*	Murata	1997	1.0	1.0		(s) 60±5.2*
			14.8	125	Ni:∅30×40, +/+	Ge(Li)	72±10	Yamamoto	1978	1.0	1.0		72±10
			15	80	Ni:∅150×30, +/+	Ge(Li)	63±6	Joensson	1968	0.91	?		57±5.5
1293	^{60}Ni(n,n')^{60}Ni	2626(3$^+$)→1333(2$^+$), p	14.1	30-150	Ni:∅30×∅26×70 +/+	Ge(Li)	12±1.4*	Murata	1997	1.0	1.0		(s) 27±2.5*
1317	^{58}Ni(n,α)^{55}Fe	1317(7/2$^-$)→0(3/2$^-$), p	14.1	30-150	Ni:∅30×∅26×70 +/+	Ge(Li)	27±2.5*	Murata	1997	1.0	1.0		(s) 27±2.5*
1333	Ni(n,n'+2n)^{60}Ni	1333(2$^+$)→0(0$^+$), p	14.1	30-150	Ni:∅30×∅26×70 +/+	Ge(Li)	159±13*	Murata	1997	1.0	1.0		(s) 159±13*
			14.8	125	Ni:∅30×40, +/+	Ge(Li)	240±29	Yamamoto	1978	1.0	1.0		240±29
			14.1	90	Ni:∅??×20, +/-	Ge(Li)	241±38	Grenier	1974	1.0	?		241±38

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
			14.4		Ø58×?, +/+	Ge(Li)	135±21	Breunlich	1972	1.0	?		135±21
			15	80	Ni:Ø150×30, +/+	Ge(Li)	230±34	Joensson	1968	0.91	?		209±31
1378	^{58}Ni(n,np)^{57}Co	1378(3/2$^-$)$\rightarrow$0(7/2$^-$), p	14.1	30-150	Ni:Ø30×Ø26×70 +/+	Ge(Li)	21±2.0*	Murata	1997	1.0	1.0		(s) 21±2*
			14.8	125	Ni:Ø30×40, +/+	Ge(Li)	36±11	Yamamoto	1978	1.0	1.0		36±11
			15	80	Ni:Ø150×30, +/+	Ge(Li)	28±5	Joensson	1968	1.0	?		28±5
1454	^{58}Ni(n,n')^{58}Ni	1454(2$^+$)$\rightarrow$0(0$^+$), p	14.1	30-150	Ni:Ø30×Ø26×70 +/+	Ge(Li)	184±16*	Murata	1997	1.0	1.0		(s) 184±16*
			14.8	125	Ni:Ø30×40, +/+	Ge(Li)	285±29	Yamamoto	1978	1.0	1.0		285±29
			14.1	90	Ni:Ø??×20, +/-	Ge(Li)	229±36	Grenier	1974	1.0	?		229±36
			14.4		Ø58×?, +/+	Ge(Li)	148±28	Breunlich	1972	1.0	?		148±28
			15	80	Ni:Ø150×30, +/+	Ge(Li)	243±36	Joensson	1968	0.91	?		221±33
2159	^{60}Ni(n,n')^{60}Ni	2159(2$^+$)$\rightarrow$0(0$^+$), p	14.1	90	Ni:Ø??×20, +/-	Ge(Li)	10±3	Grenier	1974	1.0	?		10±3
29-Copper (63 - 69.1%, 65 - 30.9%)													
670	^{63}Cu(n,n')^{63}Cu	670(1/2$^-$)$\rightarrow$0(3/2$^-$), p	14	30-150	Cu:Ø30×Ø26×70, +/+	Ge(Li)	19±2*	Murata	1997	1.0	1.0		(s) 19±2*
			14.8	125	Cu:Ø30×40, +/+	Ge(Li)	77±22	Yamamoto	1978	1.0	1.0		77±22
			14.2	55	Cu:Ø30×40, +/+	Ge(Li)	93±15	Hino	1976	1.0	1.0		93±15
			15	80	Cu:Ø150×30,Ø150×5,+/+	Ge(Li)	38±13	Joensson	1968	0.91	?		35±12
687	^{63}Cu(n,n')^{63}Cu	2013(?/2$^-$)$\rightarrow$1326(7/2$^-$),p	14.1	30-150	Cu:Ø30×Ø26×70, +/+	Ge(Li)	9.3±1*	Murata	1997	1.0	1.0		(s) 9.3±1*
881	^{63}Cu(n,n')^{63}Cu	?(?/2$^-$)$\rightarrow$1326(7/2$^-$),p	14.1	30-150	Cu:Ø30×Ø26×70, +/+	Ge(Li)	19±2*	Murata	1997	1.0	1.0		(s) 19±2*
899	^{63}Cu(n,n')^{63}Cu	1861(7/2$^-$)$\rightarrow$962(5/2$^-$), p	14	30-150	Cu:Ø30×Ø26×70, +/+	Ge(Li)	27±2*	Murata	1997	1.0	1.0		(s) 27±2*
962	^{63}Cu(n,n')^{63}Cu	962(5/2$^-$)$\rightarrow$0(3/2$^-$), p	14	30-150	Cu:Ø30×Ø26×70, +/+	Ge(Li)	128±10*	Murata	1997	1.0	1.0		128±10
			14.9	93	No Information, +/+	NaI(Tl)	199±20	Zong-Ren	1979	1.0	?		199±20
			14.8	125	Cu:Ø30×40, +/+	Ge(Li)	293±28	Yamamoto	1978	1.0	1.0		293±28
			14.2	55	Cu:Ø30×40, +/+	Ge(Li)	227±35	Hino	1976	1.0	1.0		227±35
			15	80	Cu:Ø150×30,Ø150×5,+/+	Ge(Li)	226±11	Joensson	1968	0.91	?		206±10
977	^{65}Cu(n,n')^{65}Cu	2093(?)$\rightarrow$1116(5/2$^-$), p	14	30-150	Cu:Ø30×Ø26×70, +/+	Ge(Li)	22±2*	Murata	1997	1.0	1.0		(s) 22±2*
			14.8	125	Cu:Ø30×40, +/+	Ge(Li)	38±10	Yamamoto	1978	1.0	1.0		38±10
1115	^{63}Cu(n,n')^{63}Cu	1115(5/2$^-$)$\rightarrow$0(3/2$^-$), p	14	30-150	Cu:Ø30×Ø26×70, +/+	Ge(Li)	63±5*	Murata	1997	1.0	1.0		(s) 63±5*
			14.8	125	Cu:Ø30×40, +/+	Ge(Li)	139±15	Yamamoto	1978	1.0	1.0		139±15
			14.4	90	Cu:78×77×12, 642g, ?/?	NaI(Tl)	178±46	McKinney	1972	0.74	?		132±34
			15	80	Cu:Ø150×30,Ø150×5,+/+	Ge(Li)	72±8	Joensson	1968	0.91	?		66±7
1163	^{63}Cu(n,n')^{63}Cu	2497(3/2$^-$)$\rightarrow$1327(7/2$^-$),p	14	30-150	Cu:Ø30×Ø26×70, +/+	Ge(Li)	62±5*	Murata	1997	1.0	1.0		(s) 62±5*
			14.8	125	Cu:Ø30×40, +/+	Ge(Li)	102±13	Yamamoto	1978	1.0	1.0		102±13
			15	80	Cu:Ø150×30,Ø150×5,+/+	Ge(Li)	54±5	Joensson	1968	0.91	?		49±4.5
1179	^{63}Cu(n,n')^{63}Cu	2506(?)$\rightarrow$1327(7/2$^-$), p	14	30-150	Cu:Ø30×Ø26×70, +/+	Ge(Li)	141±12*	Murata	1997	1.0	1.0		(s) 141±12*
			14.8	125	Cu:Ø30×40, +/+	Ge(Li)	229±21	Yamamoto	1978	1.0	1.0		229±21
			14.2	55	Cu:Ø30×40, +/+	Ge(Li)	160±25	Hino	1976	1.0	1.0		160±25
			15	80	Cu:Ø150×30,Ø150×5,+/+	Ge(Li)	102±10	Joensson	1968	0.91	?		93±9
1327	^{63}Cu(n,n')^{63}Cu	1327(7/2$^-$)$\rightarrow$0(3/2$^-$), p	14	30-150	Cu:Ø30×Ø26×70, +/+	Ge(Li)	100±8*	Murata	1997	1.0	1.0		(s) 100±8*
			14.8	125	Cu:Ø30×40, +/+	Ge(Li)	170±16	Yamamoto	1978	1.0	1.0		170±16
			14.2	55	Cu:Ø30×40, +/+	Ge(Li)	157±25	Hino	1976	1.0	1.0		157±25
			15	80	Cu:Ø150×30,Ø150×5,+/+	Ge(Li)	94±10	Joensson	1968	0.91	?		86±9
1412	^{63}Cu(n,n')^{63}Cu	1412(5/2$^-$)$\rightarrow$0(3/2$^-$), p	14	30-150	Cu:Ø30×Ø26×70, +/+	Ge(Li)	21±2*	Murata	1997	1.0	1.0		(s) 21±2*
			14.8	125	Cu:Ø30×40, +/+	Ge(Li)	54±8	Yamamoto	1978	1.0	1.0		54±8
			15	80	Cu:Ø150×30,Ø150×5,+/+	Ge(Li)	45±9	Joensson	1968	0.91	?		41±8
1482	^{65}Cu(n,n')^{65}Cu	1482(7/2$^-$)$\rightarrow$0(3/2$^-$), p	14	30-150	Cu:Ø30×Ø26×70, +/+	Ge(Li)	41±4*	Murata	1997	1.0	1.0		(s) 41±4*
			14.8	125	Cu:Ø30×40, +/+	Ge(Li)	83±10	Yamamoto	1978	1.0	1.0		83±10
			14.2	55	Cu:Ø30×40, +/+	Ge(Li)	83±13	Hino	1976	1.0	1.0		83±13
			14.4	90	Cu:78×77×12, 642g, ?/?	NaI(Tl)	26±29	McKinney	1972	0.74	?		19±19

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
1861	^{63}Cu(n,n')^{63}Cu	1861(?$^{-}$)→0(3/2^{-}), p	15	80	Cu:Ø150×30,Ø150×5,+/+	Ge(Li)	54±5	Joensson	1968	0.91	?		49±4.5
			14	30-150	Cu:Ø30×Ø26×70, +/+	Ge(Li)	31±3	Murata	1997	1.0	1.0		(s) 31±3*
			14.8	125	Cu:Ø30×40, +/+	Ge(Li)	60±10	Yamamoto	1978	1.0	1.0		60±10
			15	80	Cu:Ø150×30,Ø150×5,+/+	Ge(Li)	28±9	Joensson	1968	0.91	?		25±8
32-Germanium (70 - 20.6%, 72 - 27.4%, 73 - 7.8%,74 - 36.5%, 76 - 7.9%)													
563	^{76}Ge(n,n')^{76}Ge	563(2^{+})→0(0^{+}), p	14.4		Ø58×?, +/+	Ge(Li)	16±17	Breunlich	1972	0.99	?		16±17
596	^{74}Ge(n,n')^{74}Ge	596(2^{+})→0(0^{+}), p	14.4		Ø58×?, +/+	Ge(Li)	37±7	Breunlich	1972	0.99	?		37±7
834	^{72}Ge(n,n')^{72}Ge	834(2^{+})→0(0^{+}), p	14.4		Ø58×?, +/+	Ge(Li)	115±38	Breunlich	1972	0.99	?		115±38
1040	^{70}Ge(n,n')^{70}Ge	1040(2^{+})→0(2^{+}), p	14.4		Ø58×?, +/+	Ge(Li)	17±3	Breunlich	1972	0.99	?		17±3
40-Zirconium (90 - 52.0%, 91 - 11.2%, 92-17.2%, 94- 17.4%, 96 - 2.8%)													
41-Niobium (93-100%)													
150	^{93}Nb(n,2n)^{92}Nb	285(3^{+})→135(2^{+}), p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	207±19	Hongyu	1989	1.0	?		207±19
164	^{93}Nb(n,2n)^{92}Nb	389(3^{-})→225(2^{-}), p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	163±19	Hongyu	1989	1.0	?		163±19
194	^{93}Nb(n,2n)^{92}Nb	480(4^{+})→285(3^{+}), p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	91±11	Hongyu	1989	1.0	?		91±11
338	^{93}Nb(n,n')^{93}Nb	1083→744, p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	40±4	Hongyu	1989	1.0	?		40±4
357	^{93}Nb(n,2n)^{92}Nb	357(5^{+})→0(7^{+}), p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	239±14	Hongyu	1989	1.0	?		239±14
384	^{93}Nb(n,n')^{93}Nb	1334→950, p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	67±5	Hongyu	1989	1.0	?		67±5
501	^{93}Nb(n,2n)^{92}Nb	501(6^{+})→0(7^{+}), p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	263±16	Hongyu	1989	1.0	?		263±16
541	^{93}Nb(n,n')^{93}Nb	1491→950, p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	52±4	Hongyu	1989	1.0	?		52±4
744	^{93}Nb(n,n')^{93}Nb	744→0, p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	165±10	Hongyu	1989	1.0	?		165±10
688	^{93}Nb(n,n')^{93}Nb	2171(2^{+})→1483, p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	26±6	Hongyu	1989	1.0	?		26±6
808	^{93}Nb(n,n')^{93}Nb	808→0, p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	59±4	Hongyu	1989	1.0	?		59±4
920	^{93}Nb(n,n')^{93}Nb	950→30, p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	36±6	Hongyu	1989	1.0	?		36±6
934	^{93}Nb(n,2n)^{92}Nb	1414(4^{+})→480(4^{+}), p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	37±4	Hongyu	1989	1.0	?		37±4
949	^{93}Nb(n,n')^{93}Nb	949→0(2^{+}), p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	264±14	Hongyu	1989	1.0	?		264±14
979	^{93}Nb(n,n')^{93}Nb	979→0, p	14.9	90	Nb:Ø30.2×30.5, +/+	Ge(Li)	116±7	Hongyu	1989	1.0	?		116±7
42-Molybdenum (92 - 15.8%, 94 - 9.0%, 95-15.7%, 96- 16.5%, 97 - 9.5%, 98 - 23.8%, 100 - 9.6%)													
204	Mo(n,,xγ)^{95}Mo	204(3/2^{+})→0(5/2^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	11.7±1.7	Hlavac-2	1997	1.0	1.0		11.7±1.7
481	Mo(n,,xγ)^{97}Mo	481(3/2^{+})→0(5/2^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	54±6	Hlavac-2	1997	1.0	1.0		54±6
536	Mo(n,,xγ)^{100}Mo	536(2^{+})→0(0^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	46±5	Hlavac-2	1997	1.0	1.0		46±5
658	Mo(n,,xγ)^{97}Mo	658(7/2^{+})→0(5/2^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	80±9	Hlavac-2	1997	1.0	1.0		80±9
703	Mo(n,,xγ)^{94}Mo	1574(4^{+})→871(2^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	148±16	Hlavac-2	1997	1.0	1.0		148±16
720	Mo(n,,xγ)^{97}Mo	720(5/2^{+})→0(5/2^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	40±5	Hlavac-2	1997	1.0	1.0		40±5
721	Mo(n,,xγ)^{97}Mo	721(3/2^{+})→0(5/2^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	24±4	Hlavac-2	1997	1.0	1.0		24±4
735	Mo(n,,xγ)^{98}Mo	735(2^{+})→0(0^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	43±5	Hlavac-2	1997	1.0	1.0		43±5
766	Mo(n,,xγ)^{95}Mo	766(1/2^{+})→0(5/2^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	41±5	Hlavac-2	1997	1.0	1.0		41±5
773	Mo(n,,xγ)^{92}Mo	2283(4^{+})→1510(2^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	53±6	Hlavac-2	1997	1.0	1.0		53±6
778	Mo(n,,xγ)^{96}Mo	778(2^{+})→0(0^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	192±16	Hlavac-2	1997	1.0	1.0		192±16
787	Mo(n,,xγ)^{98}Mo	787(2^{+})→0(0^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	88±8	Hlavac-2	1997	1.0	1.0		88±8
813	Mo(n,,xγ)^{96}Mo	? 2438(5^{+})→1626(2^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	28±4	Hlavac-2	1997	1.0	1.0		28±4
850	Mo(n,,xγ)^{96}Mo	1628(2^{+}),1626→778(2^{+}),p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	140±16	Hlavac-2	1997	1.0	1.0		140±16
871	Mo(n,,xγ)^{94}Mo	871(2^{+})→0(0^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	241±26	Hlavac-2	1997	1.0	1.0		241±26
943	Mo(n,,xγ)^{93}Mo	943(1/2^{+})→0(5/2^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	14±2	Hlavac-2	1997	1.0	1.0		14±2
948	Mo(n,,xγ)^{95}Mo	948(9/2^{+})→0(5/2^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	95±11	Hlavac-2	1997	1.0	1.0		95±11
1025	Mo(n,,xγ)^{97}Mo	1025(7/2^{+})→0(5/2^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	40±5	Hlavac-2	1997	1.0	1.0		40±5
1074	Mo(n,,xγ)^{95}Mo	1074(7/2^{+})→0(5/2^{+}), p	14.7	125	Mo:Ø84×12.5, 131g, +/+	HPGe	28±4	Hlavac-2	1997	1.0	1.0		28±4

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
1083	Mo(n,,xγ)^{91}Nb	1187(5/2$^-$)→105(1/2$^-$), p	14.7	125	Mo:∅84×12.5, 131g, +/+	HPGe	3±1	Hlavac-2	1997	1.0	1.0		3±1
1108	Mo(n,,xγ)^{91}Nb	1313(5/2$^-$)→105(1/2$^-$), p	14.7	125	Mo:∅84×12.5, 131g, +/+	HPGe	8±2	Hlavac-2	1997	1.0	1.0		8±2
1117	Mo(n,,xγ)^{97}Mo	1117(9/2$^+$)→0(5/2$^+$), p	14.7	125	Mo:∅84×12.5, 131g, +/+	HPGe	81±9	Hlavac-2	1997	1.0	1.0		81±9
1477	Mo(n,,xγ)^{93}Mo	1477(9/2$^+$)→0(5/2$^+$), p	14.7	125	Mo:∅84×12.5, 131g, +/+	HPGe	47±6	Hlavac-2	1997	1.0	1.0		47±6
1510	Mo(n,,xγ)^{92}Mo	1510(2$^+$)→0(0$^+$), p	14.7	125	Mo:∅84×12.5, 131g, +/+	HPGe	88±10	Hlavac-2	1997	1.0	1.0		88±10
50-Tin (112 - 1.0%, 114 - 0.7%, 115-0.4%, 116- 14.5%, 117 - 7.7%, 118 - 24.2%, 119 - 8.6%, 120 - 32.6%)													
53-Iodine (127 - 100%)													
57	^{127}I(n,n') ^{127}I	57(7/2$^+$)→0(5/2$^+$), p	14.1	0-180	NaI(Tl):∅44.5×50.8, ?/?	NaI(Tl)	270±30	Cecil	1979	0.90	1.00		243±27
203	^{127}I(n,n') ^{127}I	203(3/2$^+$)→0(5/2$^+$), p	14.1	0-180	NaI(Tl):∅44.5×50.8, ?/?	NaI(Tl)	100±10	Cecil	1979	0.90	1.00		90±9
55-Cesium (133 - 100%)													
56-Barium (130 - 0.1%, 132 - 0.1%, 134 - 2.4%, 135 - 6.6%, 136 - 7.9%, 137 - 11.2, 138 - 71.7%)													
73-Tantalum (181 - 100%)													
74-Tangsten (182 - 26.4%, 183 - 14.4%, 184 - 30.6,186 - 28.4%)													
82-Lead (204 - 1.4, 206 -24.1, 207 - 22.1, 208 - 52.3)													
538	Pb(n,2n+n') ^{206}Pb	1341(3$^+$)→803(2$^+$), p	14.9	55-140	Pb:∅30×29, 231g +/+	Ge(Li)	128±6	Hongyu-2	1997	1.0	1.0		128±6
538	Pb(n,2n+n') ^{206}Pb	1341(3$^+$)→803(2$^+$), p+d	14.9	55-140	Pb:∅30×29, 231g +/+	Ge(Li)	207±9	Hongyu-2	1997	1.0	1.0		207±9
			14.8	125	Pb:∅30×40, +/+	Ge(Li)	274±54	Yamamoto	1978	1.0	1.0		274±54
			15	80	Pb:∅150×30, +/+	Ge(Li)	163±38	Joensson	1968	0.91	?		148±35
570	Pb(n,2n+n') ^{207}Pb	570(5/2$^-$)→0(1/2$^-$), p	14.9	55-140	Pb:∅30×29, 231g +/+	Ge(Li)	410±13	Hongyu-2	1997	1.0	1.0		410±13
			14.0	0-180	Pb:∅70, +/-	NaI(Tl)	950±95	Bezotosny	1976	1.0	1.0		950±95
			14.1	90	Pb:∅100×20, +/+	Ge(Li)	478±40	Clayeux	1969	1.0	?		478±40
570	Pb(n,2n+n') ^{207}Pb	570(5/2$^-$)→0(1/2$^-$), p+d	14.9	55-140	Pb:∅30×29, 231g +/+	Ge(Li)	1025±30	Hongyu-2	1997	1.0	1.0		1025±30
			14.8	125	Pb:∅30×40, +/+	Ge(Li)	1313±186	Yamamoto	1978	1.0	1.0		1313±186
			15	80	^{208}Pb:80×80×2, 143g, +/+	Ge(Li)	1043±101	Joensson	1968	0.91	?		949±92
583	^{208}Pb(n,n') ^{208}Pb	3198(3$^+$)→2615(3$^-$), p	14.9	55-140	Pb:∅30×29, 231g +/+	Ge(Li)	93.6±5.1	Hongyu-2	1997	1.0	1.0		93.6±5.1
			14.7	125	Pb:80×80×2, 143g, +/+	HPGe	79.5±5.8	Hlavac	1996	1.0	1.0		79.5±5.8
			15	80	Pb:∅150×30, +/+	Ge(Li)	126±25	Joensson	1968	0.91	?		115±23
803	Pb(n,2n+n') ^{206}Pb	803(2$^+$)→0(0$^+$), p	14.9	55-140	Pb:∅30×29, 231g +/+	Ge(Li)	366±11	Hongyu-2	1997	1.0	1.0		366±11
			14		∅60×30, +/+	NaI(Tl)	721±94	Bezotosny	1966	1.0	?		721±94
			14.1	90	Pb:∅100×20, +/+	Ge(Li)	486±39	Clayeux	1969	1.0	?		486±39
803	Pb(n,2n+n') ^{206}Pb	803(2$^+$)→0(0$^+$), p+d	14.9	55-140	Pb:∅30×29, 231g +/+	Ge(Li)	616±21	Hongyu-2	1997	1.0	1.0		616±21
			14.8	125	Pb:∅30×40, +/+	Ge(Li)	868±94	Yamamoto	1978	1.0	1.0		868±94
			14.4	90	Pb:75×75×14, 875g, ?/?	NaI(Tl)	591±101	McKinney	1972	0.74	?		437±75
			14.7	90	Pb:∅38.1×76.2, +/+	NaI(Tl)	572±13	Engesser	1967	1.0	?		572±13
			15	80	Pb:∅150×30, +/+	Ge(Li)	528±25	Joensson	1968	0.91	?		480±23
839	^{208}Pb(n,n') ^{208}Pb	4037(7$^-$)→3198(5$^-$), p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGE	13.6±3.7	Hlavac	1996	1.0	1.0		13.6±3.7
			14.0	0-180	Pb:∅70, +/-	NaI(Tl)	910±90	Bezotosny	1976	1.0	1.0		(s) 910±90
861	^{208}Pb(n,n') ^{208}Pb	3475(4$^-$)→2614(3$^-$), p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	9.4±3.7	Hlavac	1996	1.0	1.0		9.4±3.7
881	Pb(n,2n+n') ^{206}Pb	1684(4$^+$)→803(2$^+$), p	14.9	55-140	Pb:∅30×29, 231g +/+	Ge(Li)	75±5	Hongyu-2	1997	1.0	1.0		75±5
881	Pb(n,2n+n') ^{206}Pb	1684(4$^+$)→803(2$^+$), p+d	14.9	55-140	Pb:∅30×29, 231g +/+	Ge(Li)	241±15	Hongyu-2	1997	1.0	1.0		241±15
			14.8	125	Pb:∅30×40, +/+	Ge(Li)	338±62	Yamamoto	1978	1.0	1.0		338±62
			15	80	Pb:∅150×30, +/+	Ge(Li)	126±25	Joensson	1968	0.91	?		115±23

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
898	Pb(n,2n+n') ^{207}Pb	$898(3/2^-)\rightarrow0(1/2^-)$, p	14.8	125	Pb:∅30×40, +/+	Ge(Li)	221±59	Yamamoto	1978	1.0	1.0		221±59
			14.	190	Pb:∅100×20, +/+	Ge(Li)	279±23	Clayeux	1969	1.0	1.0		279±23
			15	80	Pb:∅150×30, +/+	Ge(Li)	113±13	Joensson	1968	0.91	?		103±12
1094	^{208}Pb(n,n') ^{208}Pb +	$3709(5^-)\rightarrow2615(3^-)$, p	14.	190	Pb:∅100×20, +/+	Ge(Li)	425±39	Clayeux	1969	1.0	1.0		425±39
+1095	Pb(n,2n+n') ^{207}Pb	$2728(9/2^+)\rightarrow1633(13/2^+)$,p	14.8	125	Pb:∅30×40, +/+	Ge(Li)	253±29	Yamamoto	1978	1.0	1.0		253±29
1590	Pb(n,2n+n') ^{207}Pb	$3223(?)\rightarrow1633(13/2^+)$, p	14.7	90	Pb:∅38.1×76.2, +/+	NaI(Tl)	58±19	Engesser	1967	1.0	?		58±19
			14.8	125	Pb:∅30×40, +/+	Ge(Li)	131±21	Yamamoto	1978	1.0	1.0		131±21
			14.0	0-180	Pb:∅70, +/-	NaI(Tl)	100±15	Bezotosny	1976	1.0	1.0		100±15
1770	Pb(n,2n+n') ^{207}Pb	$2340(7/2^-)\rightarrow570(5/2^-)$, p	14.8	125	Pb:∅30×40, +/+	Ge(Li)	143±26	Yamamoto	1978	1.0	1.0		143±26
			14.0	0-180	Pb:∅70, +/-	NaI(Tl)	153±20	Bezotosny	1976	1.0	1.0		153±20
			14.1	90	Pb:∅100×20, +/+	Ge(Li)	356±38	Clayeux	1969	1.0	?		356±38
			14.7	90	Pb:∅38.1×76.2, +/+	NaI(Tl)	162±33	Engesser	1967	1.0	?		162±33
			15	80	Pb:∅150×30, +/+	Ge(Li)	50±25	Joensson	1968	0.91	?		(s) 46±23
			14		∅60×30, +/+	NaI(Tl)	408±78	Bezotosny	1966	1.0	?		408±78
2615	^{208}Pb(n,n') ^{208}Pb	$2615(3^-)\rightarrow0(0^+)$, p	14.9	55-140	Pb:∅30×29, 231g +/+	Ge(Li)	171±9	Hongyu-2	1997	1.0	1.0		171±9
			14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	128±9.4	Hlavac	1996	1.0	1.0		128±9.4
			14.8	125	Pb:∅30×40, +/+	Ge(Li)	328±41	Yamamoto	1978	1.0	1.0		328±41
			14.0	0-180	Pb:∅70, +/-	NaI(Tl)	282±28	Bezotosny	1976	1.0	1.0		282±28
			14.1	90	Pb:∅100×20, +/+	Ge(Li)	240±48	Clayeux	1969	1.0	?		240±48
			14.7	90	Pb:∅38.1×76.2, +/+	NaI(Tl)	255±26	Engesser	1967	1.0	?		255±26
			15	80	Pb:∅150×30, +/+	Ge(Li)	240±13	Joensson	1968	0.91	?		218±12
			14		∅60×30, +/+	NaI(Tl)	598±77	Bezotosny	1966	1.0	?		598±77
82-Lead-208													
570	^{208}Pb(n,2n) ^{207}Pb	$570(5/2^-)\rightarrow0(1/2^-)$, p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	750±51	Hlavac	1996	1.0	1.0		750±51
583	^{208}Pb(n,n') ^{208}Pb	$3198(5^-)\rightarrow2615(3^-)$, p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	152±11	Hlavac	1996	1.0	1.0		152±11
656	^{208}Pb(n,2n) ^{207}Pb	$3384(?)\rightarrow2728(9/2^+)$, p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	39±6	Hlavac	1996	1.0	1.0		39±6
839	^{208}Pb(n,n') ^{208}Pb	$4037(7^-)\rightarrow3198(5^-)$, p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGE	26±7	Hlavac	1996	1.0	1.0		26±7
861	^{208}Pb(n,n') ^{208}Pb	$3475(4^-)\rightarrow2614(3^-)$, p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	18±7	Hlavac	1996	1.0	1.0		18±7
898	^{208}Pb(n,2n) ^{207}Pb	$898(3/2^-)\rightarrow0(1/2^-)$, p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	192±13	Hlavac	1996	1.0	1.0		192±13
1095	^{208}Pb(n,2n) ^{207}Pb	$2728(9/2^+)\rightarrow1633(13/2^+)$,p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	183±13	Hlavac	1996	1.0	1.0		183±13
1590	^{208}Pb(n,2n) ^{207}Pb	$3223(?)\rightarrow1633(1/2^+)$, p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	115±12	Hlavac	1996	1.0	1.0		115±12
1726	^{208}Pb(n,2n) ^{207}Pb	$2623(5/2+)\rightarrow898(3/2^-)$, p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	39±10	Hlavac	1996	1.0	1.0		39±10
1770	^{208}Pb(n,2n) ^{207}Pb	$2340(7/2^-)\rightarrow570(5/2^-)$, p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	176±13	Hlavac	1996	1.0	1.0		176±13
2093	^{208}Pb(n,2n) ^{207}Pb	$2662(7/2^+)\rightarrow570(5/2^-)$, p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	125±15	Hlavac	1996	1.0	1.0		125±15
2133	^{208}Pb(n,2n) ^{207}Pb	$2703(?)\rightarrow570(5/2^-)$, p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	7±3	Hlavac	1996	1.0	1.0		7±3
2486	^{208}Pb(n,2n) ^{207}Pb	$4115(15/2^+)\rightarrow1633(13/2^+)$, p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	92±9	Hlavac	1996	1.0	1.0		92±9
2615	^{208}Pb(n,n') ^{208}Pb	$2615(3^-)\rightarrow0(0^+)$, p	14.7	125	^{208}Pb:80×80×2, 143g, +/+	HPGe	245±18	Hlavac	1996	1.0	1.0		245±18
83-Bismuth (209 - 100%)													
651	^{209}Bi(n,2n) ^{208}Bi	$651\ (7^+)\rightarrow0(5^+)$, p	15.4	90	∅190×∅110×?, +/+	Ge(Li)	287±30	Lashuk	1994	0.85	?		244±26
			15.0		Bi:∅60×7.2, 200g, +/+	Ge(Li)	90±30	Feicht	1971	0.99	?		90±30
897	^{209}Bi(n,n') ^{209}Bi	$897(7/2^-)\rightarrow0(9/2^-)$, p	15.4	90	∅190×∅110×?, +/+	Ge(Li)	438±43	Lashuk	1994	0.85	?		372±37
			15.0		Bi:∅60×7.2, 200g, +/+	Ge(Li)	105±10	Feicht	1971	0.99	?		105±10
			15	80	Bi:∅150×30, +/+	Ge(Li)	163±24	Joensson	1968	0.91	?		148±22
920	^{209}Bi(n,2n) ^{208}Bi	$925\ ?\rightarrow0(5^+)$, p	15.4	90	∅190×∅110×?, +/+	Ge(Li)	480±50	Lashuk	1994	0.85	?		408±43
			15.0		Bi:∅60×7.2, 200g, +/+	Ge(Li)	380±80	Feicht	1971	0.99	?		380±80
			15	80	Bi:∅150×30, +/+	Ge(Li)	226±34	Joensson	1968	0.91	?		206±31

Eγ,	Reaction	Transition	E,	Angle,	Sample	Detect.	σ,	Author	Publ	Correction			Corrected σ
992	^{209}Bi(n,n') ^{209}Bi	2601(13/2$^+$)→1609(13/2$^+$), p	15.4	90	∅190×∅110×?, +/+	Ge(Li)	214±21	Lashuk	1994	0.85	?		182±18
			15.0		Bi:∅60×7.2, 200g, +/+	Ge(Li)	50±20	Feicht	1971	0.99	?		50±20
1007	^{209}Bi(n,n') ^{209}Bi	2617(5/2$^+$)→1609(13/2$^+$), p	15.4	90	∅190×∅110×?, +/+	Ge(Li)	154±16	Lashuk	1994	0.85	?		131±14
			15.0		Bi:∅60×7.2, 200g, +/+	Ge(Li)	140±30	Feicht	1971	0.99	?		140±30
			15	80	Bi:∅150×30, +/+	Ge(Li)	63±13	Joensson	1968	0.91	?		57±12
1131	^{209}Bi(n,n') ^{209}Bi	2741(15/2$^+$)→1609(13/2$^+$), p	15.4	90	∅190×∅110×?, +/+	Ge(Li)	78±9	Lashuk	1994	0.85	?		66±8
			15.0		Bi:∅60×7.2, 200g, +/+	Ge(Li)	15±8	Feicht	1971	0.99	?		15±8
1609	^{209}Bi(n,n') ^{209}Bi	1609(13/2$^+$)→0(9/2$^-$), p	15.4	90	∅190×∅110×?, +/+	Ge(Li)	361±35	Lashuk	1994	0.85	?		307±30
			15.0		Bi:∅60×7.2, 200g, +/+	Ge(Li)	70±10	Feicht	1971	0.99	?		70±10
			15	80	Bi:∅150×30, +/+	Ge(Li)	151±23	Joensson	1968	0.91	?		137±21
2741	^{209}Bi(n,n') ^{209}Bi	2741(15/2$^+$)→0(9/2$^-$). p	15.4	90	∅190×∅110×?, +/+	Ge(Li)	123±13	Lashuk	1994	0.85	?		105±11
			15	80	Bi:∅150×30, +/+	Ge(Li)	63±9	Joensson	1968	0.91	?		57±8
2822	^{209}Bi(n,n') ^{209}Bi	2822(5/2$^-$)→0(9/2$^-$), p	15.4	90	∅190×∅110×?, +/+	Ge(Li)	43±6	Lashuk	1994	0.85	?		37±5

Table 4. The methods used for absolute normalization and correction for attenuation and multiple scattering in the sample by authors of reviewed experiments.

Author, Year	Method of Absolute Normalization	Reference σ, mb	Recommend σ, mb	Correc-tion.
1	2	3	4	5
Hlavac-2, 1997	normarlization to E_γ=1434keV in Cr(n,xγ), E=14.7	695±28	695±28[b]	Att., MS
Hlavac-1, 1997	normarlization to E_γ=847keV in Fe(n,xγ), E=14.6	609±31	609±31[b]	Att., MS
Hongyu-2, 1997	n flux monitoring by assortiated α-particle counting			Att., MS
Hongyu, 1997	n flux monitoring by assortiated α-particle counting			Att., MS
Murata, 1997	n flux monitoring by ^{27}Al(n,α) and ^{93}Nb(n,2n) reactions			Att., MS
Hlavac, 1996	normarlization to E_γ=1778keV in ^{28}Si(n,xγ), E=14.7	390±37	390±37[a]	Att.
Hitzerberg, 1994	normarlization to γ rays in Al(n,xγ), E=14.6			Att., MS
Hlavac, 1994	normarlization to E_γ=1434keV in Cr(n,xγ), E=14.7	695±28	695±28[b]	Att., MS
Hongyu, 1994	n flux monitoring by assortiated α-particle counting			Att., MS
Lashuk, 1994	normarlization to E_γ=847keV in ^{56}Fe(n,xγ), E=1.2	530	452±9[f]	Att., MS
Lychagin, 1992	n flux monitoring by ^{27}Al(n,α) activation, E=14.1	121	121.6±0.6[c]	Att.
Dickens, 1991	n flux monitoring by scintillator counter			Att, Ms
Drosg, 1991	n flux monitoring by proton-recoil telescope			Att., MS
Guoyong, 1991	n flux monitoring by assortiated α-particle counting			Att., MS
Hongyu, 1989	n flux monitoring by assortiated α-particle counting			Att., MS
Dickens, 1988	n flux monitoring by NE213 detector with calculated efficiency			
Hongyu, 1988	n flux monitoring by assortiated α-particle counting			Att., MS
Jinqiang, 1988	n flux monitoring by assortiated α-particle counting			Att., MS
Murata, 1988	n flux monitoring by ^{27}Al(n,α) and ^{93}Nb(n,2n) activation	No inform		Att., MS
Yiming, 1988	n flux monitoring by assortiated α-particle counting			Att., MS
Oblozinsky, 1988	n flux monitoring by assortiated α-particle counting			Att., MS
Hongyu, 1986	n flux monitoring by assortiated α-particle counting			Att., MS
Bell, 1983	n flux monitoring by NE213 detector with calculated efficiency			
Bezotosny, 1980	n flux monitoring by assortiated α-particle counting			Att.
Cecil, 1979	n flux monitoring by ^{27}Al(n,p) and ^{63}Cu(n,2n), E=14.1	80, 540	77[e], 456[d]	No infor
Zong-Reng, 1979	n flux monitoring by assortiated α-particle counting			Att., MS
Drake, 1978	n flux monitoring by beam current measurem. and p-recoil telescope			Att., MS
Hino, 1978	n flux monitoring by assortiated α-particle counting			Att., MS
Yamamoto, 1978	n flux monitoring by assortiated α-particle counting			Att., MS
Degtyarev, 1977	n flux monitoring by assortiated α-particle counting			Att.
Bezotosny, 1976	n flux monitoring by assortiated α-particle counting			Att.
Prokopec, 1976	n flux monitoring by ^{63}Cu(n,2n) reactions (E=16.2)	639±32	732[d]	Att., MS
Arthur, 1975	n flux monitoring by proton-recoil scintillator			Att., MS
Orphan, 1975	n flux monitoring by callibrated scintillator counter			Att., MS
Rogers, 1975	n flux monitoring by 3He-counter and liqiud scintillator			Att., MS
Voss, 1975	n flux monitoring by scintillator counter			Att., MS
Grenier, 1974	n flux monitoring by assortiated α-particle counting			Att.
Korkalchuk, 1974	n flux monitoring by ^{63}Cu(n,2n) reactions (E=16.2)	639±32	732[d]	Att., MS
Lachkar,1974	n flux monitoring by p-telescope and assortiated α-particle counting			Att., MS
Abbondano, 1973	n flux monitoring by assortiated α-particle counting			Att.
Breunlich, 1972	n flux monitoring by ^{27}Al(n,α) reaction (E=14.4)	117.6 ± 1.4	116.8 ± 0.3[c]	Att., MS
McKinney, 1972	normarl. to E_γ=847keV from ^{56}Fe(n,xγ), E=14.4, Θ =90°	56.9 ± 5.6	41.9	No Infor.
Nellis, 1971	n flux monitoring by calibrated Long Counter			Att., MS
Feicht, 1971	n flux monitoring by ^{27}Al(n,α) reaction (E=15.0)	108 ± 1.3	107.2 ± 1.5[c]	Att. MS
Martin, 1971	n flux monitoring by assortiated α-particle counting			
Morgan, 1971	n flux monitoring by calibrated Long Counter			Att., MS
Nyberg, 1971	normarlization to E_γ=4434keV in ^{12}C(n,xγ), E=14.8	197.7 ± 3.0	180.3[e]	Att., MS
Voss, 1975	n flux monitoring by scintillator counter			Att., MS

Author, Year	Method of Absolute Normalization	Reference σ, mb	Recommend σ, mb	Correction.
Nellis, 1970	n flux monitoring by calibrated Long Counter			Att
Orphan, 1970	n flux monitoring by proton-recoil scintillator			Att., MS
Tucker, 1970	n flux monitoring by calibrated Long Counter			Att
Burimov, 1969	normarlization to production of $^{16}O(n,p)$, E=14.6	40 ± 2	35.9 e	Att., MS
	$^{27}Al(n,p)$, E=14.6	76 ± 3	73.2 e	Att., MS
	$^{27}Al(n,\alpha)$, E=14.6	116 ± 1	114.1 ± 0.5c	Att., MS
Clayeux, 1969	n flux monitoring by assortiated α-particle counting			Att., MS
Tucker, 1969	n flux monitoring by calibrated Long Counter			Att
Joenson, 1968	normarlization to E_γ=4434keV in $^{12}C(n,x\gamma)$, E=14.8	197.7 ± 3.0	180.3 e	Att., MS
Maslov, 1968	n flux monitoring by assortiated α-particle counting			Att., MS
Engesser, 1967	n flux monitoring by assortiated α-particle counting			Att., MS
Bezotosny, 1966	n flux monitoring by assortiated α-particle counting			Att., MS
Roturier , 1966	n flux monitoring by assortiated α-particle counting			Att.
Martin, 1965	n flux monitoring by assortiated α-particle counting			Att., MS
Western, 1965	n-flux monitoring by calibrated Long Counter			Att., MS
Stewart, 1964	n flux monitoring by assortiated α-particle counting			Experim.
Benveniste, 1962	n flux monitoring by assortiated α-particle counting			Att., MS
Benveniste, 1960	n flux monitoring by assortiated α-particle counting			Att., MS

Comments for Table 4:

a) ENDF/B6 version 6.1

b) A. Pavlik and H. Vonach. Physik Daten, No.13-6, Karlsruhe, 1991

c) Nuclear Data for Standards for Nuclear Measurements. Report NEANDC-311"U", 1992

d) IRDF-90 version 2. N. P. Kocherov, P. K. McLaughlin. Report IAEA-NDS-141, Vienna, 1993

e) ENDF/B6 version 6.1

f) V. Pronyaev, S. Tagesen, H. Vonach and S. Badikov, Phys. Data 13-8, Karslruhe, 1995

Table 5. Estimated experimental and evaluated discrete photon production cross sections at 14.5 MeV for elements from Li to F (NE means that there is no evaluation for this element in this library)

Reaction	Eγ, keV	Experiment		FENDL-1		ENDF/B6		BROND-2	
		N_{ex}	σ ± Δσ, mb	σ, mb	Q	σ, mb	Q	σ, mb	Q
1	2	3	4	5	6	7	8	9	10
^{6}Li(n,n')	3562	1	1.3±0.5(36%)	1.49	+0.4	1.49	+0.4	NE	
^{7}Li(n,n')	478	2	104±11(11%)	64.1	-3.6	64.1	-3.6	62	-3.8
^{9}Be(n,t)	478	2	4.8±2.9(60%)	6.0	+0.4	6.0	+0.4	NE	
^{10}B(n,n')	414	2	3.3±0.6(18%)	5.2	3.2	5.2	3.2	NE	
(n,α)	478	2	37.0±3.9(11%)	33.3	-0.9	33.3	-0.9		
(n,n')	718	3	30.7±1.6(5.3%)	31.7	+0.6	31.7	+0.6		
(n,n')	1022	3	9.4±3.5(27%)	6.3	-0.9	6.3	-0.9		
(n,p)	3368	3	22.2±1.5(6.9%)	22.6	+0.3	22.6	+0.3		
^{11}B(n,nα)	478	1	27.1±4.2(15%)	46.8	+4.5	46.8	+4.5	NE	
(n,n')	2125	2	35.4±4.7(13%)	42.7	+1.6	42.7	+1.6		
(n,n')	4445	2	130.4±16(12%)	169	+2.4	169	+2.4		
(n,n')	5021	2	29.8±4.8(16%)	21.0	-1.8	21.0	-1.8		
(n,n')	6793	1	64.9±5(7.7%)	5.0	-12.0	5.0	-12.0		
B(n,nα+α)	478	3	29.1±4.2(15%)	44.2	+3.6	44.2	+3.6	NE	
(n,n')	2125	3	37.3±18(46%)	34.2	-0.2	34.2	-0.2		
(n,p)	3368	1	15.9±8.0(50%)	4.5	-1.5	4.5	-1.5		
(n,n')	4445	3	106±10(9.4%)	135	+2.9	135	+2.9		
(n,n')	5021	3	24.4±3.6(15%)	16.8	-2.1	16.8	-2.1		
(n,n')	6793	1	52.0±4.0(7.6%)	4.0	-12.0	4.0	-12.0		
^{12}C(n,n')	4439	18	187±7.5(4.0%)	184	-0.1	184	-0.1	184	-0.1
^{14}N(n,n')	727	4	22.5±3.5(16%)	9.3	-3.8	20.3	-0.6	9.3	-3.8
(n,n')	1632	6	21.0±2.7(13%)	36	+5.6	20.6	-0.1	36	+5.6
(n,α)	2125	3	26.3±4.4(16%)	18	-1.9	14.7	-2.6	18	-1.9
(n,n')	2313	8	41.7±4.0(10%)	69	+6.8	52.7	+2.8	69	+6.8
(n,d)	3684	7	29.8±2.6(8.6%)	32	+0.8	34.4	+1.8	32	+0.8
(n,α)+(n,t)	4442	8	54.4±4.6(8.4%)	47	-1.6	43.0	-2.5	47	-1.6
(n,n')	5106	6	45.1±4.4(9.7%)	14	-7.1	42.4	-0.6	14	-7.1
(n,α)	6743	2	12.9±2.3(18%)	13	+0.1	2.4	-4.6	13	+0.1
(n,n')	7029	6	31.9±4.9(16%)	3.8	-5.7	24.4	-1.5	3.8	-5.7
^{16}O(n,n')	987	2	6.2±1.1(18%)	0.1	-5.5	0.1	-5.5	0.1	-5.5
(n,n')	1755	4	6.8±1.2(18%)	9.1	+1.9	9.1	+1.9	7.6	+1.0
(n,n')	1955	2	6.1±3.9(64%)	2.9	-0.8	2.9	-0.8	2.5	-0.9
(n,n')	2742	5	38.0±3.9(10%)	62.2	+6.2	62.2	+6.2	46	+3.0
(n, α)	3089	5	22.0±2.1(9.5%)	21.8	-0.1	21.8	-0.1	19	-1.4
(n,α)	3684	8	57.6±5.4(9.8%)	56.3	-0.2	56.3	-0.2	47	-0.5
(n,α)	3854	8	33.8±4.4(13%)	39.8	+1.4	39.8	+1.4	29	-1.1
(n,n'α)	4439	4	17.2±2.2(13%)	39.8	+10.3	39.8	+10.3	27	+4.5
(n,n')	6130	8	148±10(6.9%)	173.0	+2.5	173.0	+2.5	132	-1.6
(n,n'+p)	6130	3	183±31(17%)						
(n,n')	6917	6	47.1±4.5(9.6%)	53.3	+1.4	53.3	+1.4	45	-0.5
(n,n')	7117	7	53.4±5.4(10%)	73.0	+3.6	73.0	+3.6	51	-0.4
^{19}F(n,n')	110	1	174±50(29%)	43.6	-2.6	43.6	-2.6	44	-2.6
(n,n')	197	2	146±7.8(5.3%)	183.0	+4.7	183.0	+4.7	59	-11.1
(n,n')	1236	1	21.9±2.3(11%)	29.1	+3.1	29.1	+3.1	13	-0.6
(n,n')	1357	2	40.2±3.8(9.5%)	62.1	+5.8	62.1	+5.8	13	-0.6
(n,d)	1982	2	32.7±3.1(9.4%)	ND		ND		ND	
(n,n')	2583	1	48.5±25(52%)	14.3	-1.4	14.3	-1.4	19	-1.2
(n,n')	4181	1	34.0±25(74%)	1.46	-1.3	1.46	-1.3	5.7	-1.2

Table 6. Estimated experimental and evaluated discrete photon production cross sections (mb) at 14.5 MeV for elements from Na to Bi (NE means that there is no evaluation for this element in this library, NGE - no gamma-ray evaluation, NDD - no discrete γ-rays production cross-sections data).

Reaction	Eγ, keV	Experiment		FENDL-1		ENDF/B6		BROND-2	
		N	σ±Δσ, (Δσ/σ)	σ_d (Q)	σ_c (Q)	σ_d (Q)	σ_c (Q)	σ_d (Q)	σ_c
1	2	3	4	5	6	7	8	9	10
^{23}Na(n,n')	440	5	453±44(10%)	0(-10)		0	345(-2.5)		
(n,n')	627	2	20.9±3.5(17%)	0(-5.6)		NDD			
(n,α)	656	2	45±4.0(9%)	NDD		NDD			
(n,α)	823	3	17.2±3.0(18%)	NDD	15C	NDD	15C	NE	NE
(n,d)	1275	5	184±12(6.5%)	NDD		NDD	150(-2.8)		
(n,n')	1636	3	141±15(10%)	0(-9.4)		NDD			
(n,n'+p)	1636	2	271±23(8.3%)	NDD		NDD			
Mg(n,α)	350	2	88±26(29%)	NDD		NDD			
(n,p)	472	3	105±23(22%)	NDD		NDD			
(n,n')	1369	12	450±36(8%)	NDD		NDD	285(-4.6)		
(n,n')	1809	5	81±8.4(10%)	NDD		NDD			
(n,n')	3867	3	30±4.2(14%)	NDD	15C	NDD	15C	NE	NE
(n,n')	4239	3	30±3.7(13%)	NDD		NDD			
(n,n')	4640	3	21.5±3.4(16%)	NDD		NDD			
^{27}Al(n,α)	472	4	57±7.6(13%)	NDD		NDD			
(n,n')	844	8	32±5.5(18%)	0(-5.8)		38(+1.1)			
(n,p)	844	1	47±2.4(5%)						
(n,n'+p)	844	6	74±6.4(9%)						
(n,p)	985	7	28±3.9(14%)						
(n,n')	1014	8	66±9(8.1%)	0(-7.3)		82(+1.8)			
(n,p)	1014	1	25±2(8%)		15C		15C	NE	NE
(n,n'+p)	1014	5	86±3.5(4%)						
(n,d)	1698	5	30±3.4(12%)	0(-8.8)					
(n,n')	1720	5	56±13(23%)	0(-4.3)					
(n,d)	1809	14	184±10(5.6%)	0	233(+4.9)	164(-2.0)			
(n,n')	2211	17	145±10(6.8%)	0	170(+2.5)	152(0.7)			
(n,n')	3004	20	111±6.3(5.6%)	0(-18.0)		92(-3.0)			
(n,n')	3203	3	32±10(31%)	NDD		18(-1.4)			
Si(n,α)	390	1	25±4(8%)						
(n,α)	585	5	41±10(24%)			NDD	70(+2.9)		
(n,np)	844	1	10±2(20%)						
(n,p)	941	3	12.6±4.7(37%)			NDD			
(n,α)	975	1	41±6(15%)						
(n,p)	983	3	25±1.0(4.1%)			NDD			
(n,np)	1014	1	22±4(18%)		15C		15C		15C
(n,np)	1589	1	24±4(17%)						
(n,n')	1779	13	403±18(4.3%)	442(+2.2)		0	595(+11)	442(+2.2)	
(n,p)	1779	1	232±16(7%)						
(n,n'+p)	1779	2	629±28(4.5%)						
(n,n')	2839	6	59±6.7(12%)	70(+1.6)		NDD		70(+1.6)	
(n,n')	5100	3	37±5.5(16%)	11(-4.5)		NDD	45(+1.5)	11(-4.5)	
(n,n')	6879	3	36±7(21%)	26(-1.4)		NDD	76(+5.7)	26(-1.4)	
^{31}P(n,n')	1266	3	153±30(20%)	146(-0.2)		146(-0.2)		146(-0.2)	
(n,n')	2149	1	51±9(18%)	NDD	15S	NDD	15S	NDD	15S
(n,n')	2234	3	349±50(14%)	146(-4.1)		146(-4.1)		146(-4.1)	
S(n,α)	1273	4	127±17(14%)	NDD		NDD			
(n,n')	1720	1	175±21(12%)	NDD		NDD			
(n,α)	2028	1	115±26(23%)	NDD	15S	NDD	15S	NE	NE

Reaction	Eγ, keV	N	Experiment $\sigma\pm\Delta\sigma$, $(\Delta\sigma/\sigma)$	FENDL-1 σ_d (Q)	FENDL-1 σ_c (Q)	ENDF/B6 σ_d (Q)	ENDF/B6 σ_c (Q)	BROND-2 σ_d (Q)	BROND-2 σ_c
(n,n')	2230	5	291±26(8.9%)	560(+10)		560(+10)			
(n,n')	2770	2	43±6(14%)	104(+10)		104(+10)			
(n,n')	4460	1	94±19(20%)	NDD		NDD			
Cl(n,n')	1219	1	96±20(21%)	NDD		NDD		0(-4.8)	
(n,n')	1300	2	42.7±9.9(23%)	NDD		NDD		0(-4.3)	
(n,n')	1727	1	289±89(31%)	0(-3.2)		0(-3.2)		0(-3.3)	
(n,n')	1763	2	108±36(33%)	NDD	15S	NDD	15S	0(-3.0)	
(n,d)	2127	2	235±44(19%)	NDD		NDD		NDD	
(n,n')	3163	1	73±15(21%)	NDD		NDD		0(-4.9)	
K(n,α)	788	2	33±24(74%)	NDD		NDD			
(n,α)	1165	2	21±9(44%)	NDD		NDD			
(n,p)	1267	2	22±9(39%)	NDD		NDD			
(n,n')	1677	1	112±11(10%)	NDD		NDD			
(n,d)	1769	2	16±15(96%)	NDD		NDD			
(n,α)	1951	2	14±10(70%)	NDD	15S	NDD	15S	NE	NE
(n,d)	2168	2	218±25(12%)	NDD		NDD			
(n,n')	2523	1	39±13(33%)	NDD		NDD			
(n,n')	2814	2	77±8(11%)	0(-9.6)		0(-9.6)			
(n,n')	3598	1	23±3(13%)	NDD		NDD			
(n,d)	3680	1	98±10(10%)	NDD		NDD			
Ca(n,p)	770	1	70±15(21%)	NDD		NDD			
(n,p)	892	2	51±16(30%)	NDD		NDD			
(n,n')	1157	2	28±4(13%)	NDD		12(-7.0)			
(n,α)	1611	2	64±12(19%)	NDD	15C	NDD	15C	NE	NE
(n,α)	2796	1	34±8(24%)	NDD		NDD			
(n,n')	3736	2	112±18(16%)	NDD		NDD			
(n,n')	3904	1	46±11(24%)	NDD		NDD			
Ti(n,n'+2n)	160	1	404±43(11%)	NDD		0(-9.4)			
(n,n'+2n)	890	2	62±7(12%)	NDD		0(-8.9)			
(n,n'+2n)	944	1	47±6(13%)	NDD		NDD			
(n,n'+2n)	984	4	666±61(9%)	NDD		0(-11)			
(n,n'+2n)	1312	3	238±27(12%)	NDD	15S	NDD	15S	NE	NE
(n,n'+2n)	1437	1	49±7(14%)	NDD		NDD			
(n,n')	1555	3	32±4(13%)	NDD		NDD			
(n,n'+2n)	1762	1	23±13(57%)	NDD		NDD			
(n,n'+2n)	2240	1	32±5(16%)	NDD		NDD			
(n,n'+2n)	2375	2	54±9(17%)	NDD		NDD			
^{51}V(n,2n)	226	2	368±48(13%)	NDD		NDD			
(n,n')	320	2	313±14(4.6%)	1.8(-22)		1.8(-22)			
(n,2n)	815	3	19±1.6(8.4%)	NDD		NDD			
(n,2n)	836	3	31±3(10%)	NDD		NDD			
(n,2n)	910	3	88±6.9(7.9%)	NDD		NDD			
(n,n')	929	3	49±2.4(4.9%)	0.9(-20)		0.9(-20)			
(n,2n)	946	3	19±1.5(7.9%)	NDD		NDD			
(n,2n)	1090	3	60±2.4(4.0%)	NDD	15S	NDD	15S	NE	NE
(n,d)	1121	3	13.4±1.5(11%)	NDD		NDD			
(n,d)	1174	3	20±1.9(9.4%)	NDD		NDD			
(n,n')	1437	3	18.0±2.9(16%)	NDD		NDD			
(n,n')	1494	3	17.1±2.8(17%)	0.1(-6.1)		0.1(-6.1)			
(n,d)	1554	3	30.3±1.8(5.8%)	NDD		NDD			
(n,n')	1609	3	214±8(3.9%)	2.6(-27)		2.6(-27)			
(n,n')	1777	3	32.5±8.5(26%)	0.7(-3.7)		0.7(-3.7)			
(n,n')	1813	3	68.1±4.4(6.4%)	0.7(-15)		0.7(-15)			
(n,n')	2004	3	11.6±3.8(33%)	NDD		NDD			
(n,n')	2334	3	17.3±1.7(10%)	NDD		NDD			

Reaction	Eγ, keV	Experiment N	Experiment σ±Δσ, (Δσ/σ)	FENDL-1 σ_d (Q)	FENDL-1 σ_c (Q)	ENDF/B6 σ_d (Q)	ENDF/B6 σ_c (Q)	BROND-2 σ_d (Q)	BROND-2 σ_c
Cr(n,n'+2n)	648	2	63±3.7(5.9%)	1.5(-16)		1.5(-16)		0.2(-17)	
(n,n'+2n)	705	1	29±3(10%)	1.4(-6.9)		1.4(-6.9)		NDD	
(n,n'+2n)	744	3	70±9(13%)	2.4	77(+1.0)	2.4	77(+1.0)	2.5(-7.5)	
(n,2n)	749	2	35±1.8(5.1%)	NDD	129(+5.2)	NDD	129(+5.2)	NDD	
(n,n'+2n)	935	5	210±9.4(4.5%)	8.9	248(+5.0)	8.9	248(+5.0)	NDD	
(n,n'+2n)	1006	2	23.1±3.9(17%)	1.6(+5.5)		1.6(+5.5)		5.9(-4.4)	
(n,2n)	1164	2	31.2±2.4(7.7%)	NDD	88(+24)	NDD	88(+24)	NDD	
(n,n'+2n)	1246	2	28.3±3.2(11%)	1.0(-8.3)	6C	1.0(-8.3)	6C	0(-8.8)	15C
(n,n'+2n)	1290	2	25±2.8(11%)	3.2(-7.8)		3.2(-7.8)		4.3(-7.5)	
(n,n'+2n)	1334	4	187±13(6.9%)	7.2	142(-2.9)	7.2	142(-2.9)	1.8(-14)	
(n,n'+2n)	1434	6	695±35(5%)	62.5	637(+0.1)	62.5	637(+0.1)	73.1(-18)	
(n,n'+2n)	1531	4	46±4.2(9.2%)	1.2(-11)		1.2(-11)		NDD	
(n,n'+2n)	1728	3	33±3.6(11%)	5.3(-7.8)		5.3(-7.8)		NDD	
^{52}Cr(n,n')	648	1	70±4(5.7%)	1.8	31(-9.3)	1.8	31(-9.3)	0.2(-17)	
(n,n')	705	1	42±3(7.1%)	1.7(-13)		1.7(-13)		NDD	
(n,n')	744	1	71±4(6.2%)	2.9	85(+4.3)	2.9	85(+4.3)	2.5(-17)	
(n,2n)	749	1	42±2(4.8%)	NDD	44(+1.0)	NDD	44(+1.0)	NDD	
(n,n')	935	1	237±9(3.8%)	11	272(+5.1)	11	272(+5.1)	NDD	
(n,2n)	1164	1	36±4(11%)	NDD	30(+1.5)	NDD	30(+1.5)	NDD	
(n,n')	1246	1	39±4(10%)	1.2	22(-4.0)	1.2	22(-4.0)	0(-10)	15C
(n,n')	1334	1	205±8(3.9%)	8.6	156(-5.6)	8.6	156(-5.6)	1.8(-25)	
(n,n')	1434	1	783±30(3.8%)	75	694(-0.5)	75	694(-0.5)	73.1(-24)	
(n,n')	1531	1	40±3(7.5%)	1.4	34(-1.8)	1.4	34(-1.8)	NDD	
(n,n')	1728	1	26±4(15%)	6.3	9.6(-2.5)	6.3	9.6(-2.5)	NDD	
^{55}Mn(n,n')	126	1	383±27(7%)	63	293(-1.0)	63	293(-1.0)		
(n,2n)	156	1	542±38(7%)		464(-2.0)		464(-2.0)		
(n,2n)	212	1	299±19(6.4%)		269(-1.6)		269(-1.6)		
(n,2n)	252	1	52±5(10%)		40(-2.4)		40(-2.4)		
(n,n')	306	1	26±4(15%)	3.9(-5.5)		3.9(-5.5)			
(n,2n)	408	1	26±3(7.4%)		15(-3.7)		15(-3.7)		
(n,2n)	471	1	66±7(11%)						
(n,2n)	705	1	108±8(7%)		96((-1.5)		96((-1.5)		
(n,2n)	768	1	28±4(14%)		6C		6C	NE	NE
(n,np)	835	1	83±7(8.4%)		34(-7.0)		34(-7.0)		
(n,2n)	839	1	58±5(11%)		27(-6.2)		27(-6.2)		
(n,n')	858	1	95±7(7.4%)	20	98(+1.5)	20	98(+1.5)		
(n,n')	1020	1	67±6(9.0%)	1.7	29(-0.3)	1.7	29(-0.3)		
(n,n')	1164	1	107±9(8%)	3.5	79(-2.8)	3.5	79(-2.8)		
(n,n')	1528	1	48±4(8%)	0.9	21(-6.5)	0.9	21(-6.5)		
Fe(n,2n)	411	5	53±6(11%)	NDD	38(-2.5)	NDD	38(-2.5)		
(n,2n)	476	4	50±7(13%)	NDD	29(-3.0)	NDD	29(-3.0)		
(n,n'+2n)	847	21	785±48(6.1%)	115	476(-4.0)	115	476(-4.0)		
(n,2n)	931	10	126±25(20%)	NDD	111(-0.6)	NDD	111(-0.6)		
(n,n'+2n)	1038	9	52±6(11%)	8.0	51(+1.2)	8.0	51(+1.2)		
(n,n'+2n)	1238	21	393±22(5.7%)	17	247(-5.9)	17	247(-5.9)		
(n,n'+2n)	1305	7	76±8(11%)	1.0	36(-4.9)	1.0	36(-4.9)	NGE	NG
(n,2n)	1317	9	76±7(10%)	NDD	54(-3.1)	NDD	54(-3.1)		
(n,2n)	1408	7	50±8(15%)	NDD	25(-3.1)	NDD	25(-3.1)		
(n,n'+2n)	1671	7	36±6(17%)	0.7	9.3(-4.3)	0.7	9.3(-4.3)		
(n,n'+2n)	1811	11	63±5(7.6%)	8.3	1.9(-11)	0.9	1.9(-12)		
(n,n'+2n)	2113	9	41±6(15%)	0.7	1.0(-6.7)	0.7	1.0(-6.7)		
(n,n'+2n)	2523	7	21±5(22%)	3.7(-3.6)		3.7(-3.6)			
(n,n'+2n)	2598	8	35±5(14%)	2.0(-6.6)	6C	2.0(-6.6)	6C		
^{56}Fe(n,p)	212	1	17.1±1.2(7.0%)	NDD		NDD			
(n,p)	336	1	12.2±1.0(8.1%)	NDD		NDD			

Reaction	Eγ, keV	Experiment		FENDL-1		ENDF/B6		BROND-2	
		N	σ±Δσ, (Δσ/σ)	σ_d (Q)	σ_c (Q)	σ_d (Q)	σ_c (Q)	σ_d (Q)	σ_c
(n,2n)	411	1	32.5±2.4(7.4%)	NDD	42(-4.2)	NDD	42(-4.2)		
(n,2n)	476	1	38.0±4.3(11%)	NDD	32(-1.4)	NDD	32(-1.4)		
(n,n')	847	1	621±29(4.5%)	126	526(+1.1)	126	526(+1.1)		
(n,2n)	931	1	84.1±7.4(8.8%)	NDD	121(+5.0)	NDD	121(+5.0)		
(n,α)	1006	1	13.3±1.5(11%)	NDD		NDD			
(n,n')	1038	1	47.1±4.3(9.1%)	8.7	54(+3.7)	8.7	54(+3.7)	NGE	NG
(n,n')	1238	1	290±16(5.5%)	18.3	259(-0.8)	18.3	259(-0.8)		
(n,n')	1305	1	73.1±4.8(6.6%)	1.1	39(-6.9)	1.1	39(-6.9)		
(n,2n)	1317	1	53.7±5.9(11%)	NDD	59(+0.8)	NDD	59(+0.8)		
(n,2n)	1408	1	23.7±4.8(20%)	NDD	27(+0.7)	NDD	27(+0.7)		
(n,n')	1671	1	54.5±5.6(10%)	0.8(-9.6)		0.8(-9.6)			
(n,n')	1811	1	37.5±4.6(12%)	9.1	37(+1.3)	9.1	37(+1.3)		
(n,n')	2035	1	10.2±3.5(34%)	1.3(-2.6)		1.3(-2.6)			
(n,n')	2113	1	15.3±4.7(31%)	0.8	9.7(-1.0)	0.8	9.7(-1.0)		
^{57}Fe(n,n')	122	1	70±17(24%)						
(n,n')	353	1	54.1±6.2(11%)						
(n,n')	1061	1	66±13(20%)						
(n,n')	1449	1	22±10(45%)						
(n,n')	2113	1	15.3±4.7(31%)						
^{59}Co(n,2n)	112	1	54±2(4%)	NDD		NDD			
(n,2n)	321	2	89±21(23%)	NDD		NDD			
(n,2n)	366	2	47±8(18%)	NDD		NDD			
(n,2n)	433	2	51±4(7%)	NDD		NDD			
(n,n')	694	1	61±3(5%)	0(-20)		0(-20)			
(n,np)	811	2	59±6(19%)	NDD	15S	NDD	15S	NE	NE
(n,2n)	1051	2	88±6(6.7%)	NDD		NDD			
(n,n')	1099	2	54±3(21%)	8.1(-15)		8.1(-15)			
(n,n')	1190	2	164±32(19%)	19(-4.5)		19(-4.5)			
(n,n')	1291	2	35±2(5%)	0.2(-17)		0.2(-17)			
(n,n')	1459	2	132±20(16%)	23(-5.0)		23(-5.0)			
(n,n')	1482	2	43±4(9%)	19(-6.3)		19(-6.3)			
Ni(n,n')	826	2	25±4.0(16%)	0.6	1.5(-5.8)	0.6	1.5(-5.8)	NDD	
(n,α)	931	1	29±9(31%)	NDD	25(-0.4)	NDD	25(-0.4)	NDD	
(n,n')	1004	3	75±13(17%)	4.8	60(-0.8)	4.8	60(-0.8)	NDD	
(n,p)	1044	1	58±11(19%)	NDD		NDD		NDD	
(n,n')	1173	4	81±15(18%)	1.8(-5.3)		1.8(-5.3)		NDD	
(n,α)	1213	1	114±19(17%)	NDD	12(-5.4)	NDD	12(-5.4)	NDD	
(n,np)	1223	2	62±7(11%)	NDD	6C	NDD	6C	NDD	15S
(n,n'+2n)	1334	4	211±24(11%)	19(-8.0)		19(-8.0)		NDD	
(n,np)	1378	1	30±5(15%)	NDD	1.3(-5.8)	NDD	1.3(-5.8)	NDD	
(n,n')	1454	4	242±27(11%)	46	129(-2.5)	46	129(-2.5)	NDD	
(n,n')	2159	1	10±3(30%)	0.1(-3.3)		0.1(-3.3)		NDD	
Cu(n,n')	670	4	44±19(44%)	6.2(-2.0)		6.2(-2.0)		38(+0.3)	
(n,n')	899	1	27±2(7%)	1.3	36(+5.0)	1.3	36(+5.0)	NDD	
(n,n')	962	5	202±24(12%)	26.9	111(-8.4)	26.9	111(-8.4)	232(+0.8)	
(n,n')	977	2	24±5(21%)	1.0	13(-2.0)	1.0	13(-2.0)	NDD	
(n,n')	1115	4	86±19(23%)	10.0	59(-0.9)	10.0	59(-0.9)	66(-1.0)	
(n,n')	1163	3	65±13(20%)	0.8(-4.9)	6C	0.8(-4.9)	6C	NDD	15C
(n,n')	1179	4	156±30(19%)	1.7(-5.1)		1.7(-5.1)		NDD	
(n,n')	1327	4	122±20(17%)	19.4	79(-1.2)	19.4	79(-1.2)	107(-0.3)	
(n,n')	1412	3	32±10(32%)	2.6(-2.9)		2.6(-2.9)		NDD	
(n,n')	1482	4	58±10(18%)	6.0	35(-1.7)	6.0	35(-1.7)	NDD	
(n,n')	1861	3	37±9(24%)	1.8(-3.9)		1.8(-3.9)		NDD	
Ge(n,n')	559	1	16±17(106%)						
(n,n')	596	1	37±7(20%)	NE		NGE		NE	

Reaction	E_γ, keV	Experiment N	Experiment $\sigma\pm\Delta\sigma$, $(\Delta\sigma/\sigma)$	FENDL-1 σ_d (Q)	FENDL-1 σ_c (Q)	ENDF/B6 σ_d (Q)	ENDF/B6 σ_c (Q)	BROND-2 σ_d (Q)	BROND-2 σ_c
(n,n')	835	1	115±38(30%)						
(n,n')	1040	1	17±3(18%)						
Zr(n,n')	561	0		20.1				20.1	
(n,n')	918	0		22.1				22.1	
(n,n')	934	0		14.9		NGE		14.9	
(n,n')	1139	0		8.5				8.5	
(n,n')	2187	0		29.0				29.0	
(n,n')	4232	0		10.1				10.1	
^{93}Nb(n,2n)	150	1	207±19(9%)	NDD		NDD		NDD	
(n,2n)	164	1	163±19(12%)	NDD		NDD		NDD	
(n,2n)	194	1	91±11(12%)	NDD		NDD		NDD	
(n,n')	338	1	40±4(10%)	NDD		NDD		NDD	
(n,2n)	357	1	239±14(6%)	NDD		NDD		NDD	
(n,n')	384	1	67±5(7%)	NDD		NDD		NDD	
(n,2n)	501	1	263±16(6%)	NDD		NDD		NDD	
(n,n')	541	1	52±4(8%)	NDD	15C	NDD	15S	NDD	15C
(n,n')	688	1	26±6(23%)	NDD		NDD		NDD	
(n,n')	744	1	165±10(6%)	NDD		NDD		NDD	
(n,n')	808	1	59±4(7%)	NDD		NDD		NDD	
(n,n')	920	1	36±6(17%)	NDD		NDD		NDD	
(n,2n)	934	1	37±4(11%)	NDD		NDD		NDD	
(n,n')	949	1	264±14(5%)	NDD		NDD		NDD	
(n,n')	979	1	116±7(6%)	NDD		NDD		NDD	
Mo(n,xγ)	204	1	11.7±1.7(15%)	NDD		NDD		NDD	
(n,xγ)	481	1	54±6(11%)	NDD		NDD		NDD	
(n,xγ)	536	1	46±5(11%)	NDD		NDD		NDD	
(n,xγ)	658	1	80±9(11%)	NDD		NDD		NDD	
(n,xγ)	703	1	148±16(11%)	NDD		NDD		NDD	
(n,xγ)	720	1	40±5(13%)	NDD		NDD		NDD	
(n,xγ)	721	1	24±5(17%)	NDD		NDD		NDD	
(n,xγ)	735	1	43±5(12%)	NDD	15C	NDD	15S	NDD	15C
(n,xγ)	766	1	41±5(12%)	NDD		NDD		NDD	
(n,xγ)	773	1	53±6(11%)	NDD		NDD		NDD	
(n,xγ)	778	1	192±16(11%)	NDD		NDD		NDD	
(n,xγ)	787	1	88±8(9%)	NDD		NDD		NDD	
(n,xγ)	813	1	28±4(14%)	NDD		NDD		NDD	
(n,xγ)	850	1	140±16(11%)	NDD		NDD		NDD	
(n,xγ)	871	1	241±26(11%)	NDD		NDD		NDD	
(n,xγ)	943	1	14±2(14%)	NDD		NDD		NDD	
(n,xγ)	948	1	95±11(12%)	NDD		NDD		NDD	
(n,xγ)	1025	1	40±5(13%)	NDD		NDD		NDD	
(n,xγ)	1074	1	28±4(14%)	NDD		NDD		NDD	
(n,xγ)	1083	1	3±1(33%)	NDD		NDD		NDD	
(n,xγ)	1108	1	8±2(11%)	NDD		NDD		NDD	
(n,xγ)	1117	1	81±9(11%)	NDD		NDD		NDD	
(n,xγ)	1477	1	47±6(13%)	NDD		NDD		NDD	
(n,xγ)	1510	1	88±10(11%)	NDD		NDD		NDD	
Sn(n,n')		0		NGE		NGE		NGE	
I(n,n')	57	1	243±27(11%)	NE		NDD	6C	NGE	
(n,n')	202	1	90±9(10%)			NDD			
Cs(n,n')		0		NE		NGE		NGE	
Ba(n,n')		0		NDD	15S	NDD	15S	NE	
Ta(n,n')	10	0		NDD		1511		1511	
(n,n')	11	0		NDD		245		245	
(n,n')	57	0		NDD		1304		1304	

Reaction	Eγ, keV	Experiment		FENDL-1		ENDF/B6		BROND-2	
		N	$\sigma \pm \Delta\sigma$, $(\Delta\sigma/\sigma)$	σ_d (Q)	σ_c (Q)	σ_d (Q)	σ_c (Q)	σ_d (Q)	σ_c
(n,n')	67	0		NDD	**15C**	1480	**15S**	1480	**15S**
(n,n')	136	0		0.8		80		80	
(n,n')	152	0		1.6		80		80	
(n,n')	482	0		0.3		117		117	
W(n,n')	47	0		42		42		0	
(n,n')	52	0		26		26		0	
(n,n')	99	0		25		25		0	
(n,n')	100	0		117		117		0	
(n,n')	111	0		112		112		0	
(n,n')	122	0		112	**15C**	112	**15C**	NDD	**15C**
(n,n')	229	0		45		45		0	
(n,n')	253	0		35		35		0	
(n,n')	274	0		44		44		NDD	
(n,n')	351	0		26		26		0	
(n,n')	412	0		28		28		NDD	
(n,n')	464	0		15		15		0	
Pb(n,n'+2n)	538	2	222±62(28%)	2.1	162(-0.9)	2.1	162(-0.9)	2.1(-3.5)	
(n,n'+2n)	570	4	826±164(20%)	8.0	964(+0.9)	8.0	964(+0.9)	18.1(-4.9)	
(n,n')	583	2	84±11(14%)	13.8	54(-1.5)	13.8	54(-1.5)	24.1(-5.5)	
(n,n'+2n)	803	6	554±49(9%)	21.4	410(-2.5)	21.4	410(-2.5)	53(-10)	
(n,n')	839	1	13.6±3.7(27%)						
(n,n')	861	1	9.4±3.1(33%)						
(n,n'+2n)	881	2	236±111(47%)	4.2	121(-1.0)	4.2	121(-1.0)	0(-2.1)	
(n,n'+2n)	898	3	220±57(26%)	0(-3.9)		0(-3.9)		39(-3.2)	
(n,n'+2n)	1094	2	358±84(24%)	0(-4.3)	**6C**	0(-4.3)	**6C**	NDD	15S
(n,n'+2n)	1590	3	109±16(15%)	0(-6.8)		0(-6.8)		0(-6.8)	
(n,n'+2n)	1770	5	261±55(21%)	0.5	137(-2.2)	0.5	137(-2.2)	8.9(-4.6)	
(n,n')	2615	7	245±46(19%)	54.9	109(-2.0)	54.9	109(-2.0)	130(-2.5)	
^{208}Pb(n,2n)	570	1	750±51(6.8%)		1721(+19)		1721(+19)		
(n,n')	583	1	152±11(7.2%)	26.5	104(-2.0)	26.5	104(-2.0)	51(-9.2)	
(n,2n)	656	1	39±6(15%)						
(n,n')	839	1	26±7(27%)						
(n,n')	861	1	18±7(39%)	0.1(-2.5)		0.1(-2.5)		0.1(-2.5)	
(n,2n)	898	1	192±13(6.8%)		176(-1.2)		176(-1.2)		
(n,2n)	1095	1	183±13(7.1%)					0.1(-14)	
(n,2n)	1590	1	115±12(10%)						
(n,2n)	1726	1	39±10(26%)						
(n,2n)	1770	1	176±13(7.4%)		262(+6.6)		262(+6.6)		
(n,2n)	2093	1	125±15(12%)						
(n,2n)	2133	1	7±3(43%)						
(n,2n)	2486	1	92±9(10%)						
(n,n')	2615	1	245±18(7.4%)	106	208(+3.8)	106	208(+3.8)	254(+0.5)	
^{209}Bi(n,2n)	651	2	230±45(19%)	NDD		NDD		NDD	
(n,n')	897	3	218±89(41%)	NDD		16.5(-2.3)		71(-1.7)	
(n,2n)	920	3	347±63(18%)	NDD		NDD		NDD	
(n,n')	992	2	174±31(17%)	NDD		11(-5.3)		0(-5.6)	
(n,n')	1007	3	120±20(17%)	NDD	**15S**	NDD	**15S**	NDD	15S
(n,n')	1131	2	64±11(17%)	NDD		2.3(-5.6)		0(-5.8)	
(n,n')	1609	3	211±75(35%)	NDD		9.6(-2.7)		0(-2.8)	
(n,n')	2741	2	88±23(26%)	NDD		NDD		0(-3.8)	
(n,n')	2822	1	37±5(14%)	NDD		0.4(-7.4)		0(-7.4)	

Table 7. List of WRENDA requests, status of experimental and evaluated (FENDL-1, ENDF/B6, BROND-2) data for discrete γ-rays production cross sections (Comments: No Exp – there is no experimental data, NGE - no gamma-rays production cross section evaluation in this library, NE - no evaluation for this element at all in this library).

N	Ele-ment	WRENDA Request (Priority)	Estimated Experiment					FENDL-1E					ENDF/B6					BROND-2				
			Nγ	$\sigma \pm \Delta\sigma$ (mb)	$\Delta\sigma/\sigma$	$\Delta S/S$	Sta-tus	Nγ	σ (mb)	Qtot	Qdif	Sta-tus	Nγ	σ (mb)	Qtot	Qdif	Sta-tus	Nγ	σ (mb)	Qtot	Qdif	Sta-tus
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	Li	15%(2)	2	96±11	11%	11%	Y	2	59	-2.8	2.8	N	2	59	-2.8	2.8	N	1	57	-3.0	3.0	N
	^{6}Li		1	1.3±0.5	36%	36%	N	1	1.5	+0.4	0.4	Y	1	1.5	+0.4	0.4	Y			NE		
	^{7}Li		1	104±11	11%	11%	Y	1	64.1	-2.9	2.9	N	1	64.1	-2.9	2.9	N	1	62.0	-3.8	3.8	N
2	Be	4-15%(2)	1	4.8±2.9	60%	60%	N	1	6.0	+0.3	0.3	Y	1	6.0	+0.3	0.3	Y			NE		
3	B		6	265±23	8.7%	17.8%		6	239	-0.8	2.7	N	6	239	-0.8	2.7	N			NE		
	^{10}B		5	103±5.7	5.6%	11.0%		5	99	-0.7	0.8	Y	5	99	-0.7	0.8	Y			NE		
	^{11}B		5	288±19	6.4%	12.1%		5	285	-0.2	2.8	YN	5	285	-0.2	2.8	YN			NE		
4	C	4-10%(2)	1	184.4±7.0	3.8%	3.8%	Y	1	184	-0.1	0.1	Y	1	184	-0.1	0.1	Y	1	210	+3.7	3.7	N
5	N		9	286±12	4.0%	11.7%		9	242	-3.8	4.0	N	9	255	-2.6	1.7	N	9	242	-3.8	4.0	N
6	O	4-10%(2)	12	471±33	7.0%	13.8%	YN	11	531	+1.8	3.1	N	11	531	+1.8	3.1	N	11	406	-1.9	1.5	N
7	F	15%(2)	7	497±62	12.5%	23.5%	YN	6	337	-2.6	1.6	N	6	337	-2.6	1.6	N	6	154	-5.5	5.3	N
8	Na		7	1132±54	4.7%	9.2%		3	0	-21	21	N	2	495		2.6				NE		
9	Mg		7	806±51	6.3%	13%		0	0	-16	16	N	1	285						NE		
10	Al		13	887±27	3.1%	10%		7	403	-18	3.9	N	6	546		1.7				NE		
11	Si	5-10%(2)	14	967±30	3.1%	9.2%	Y	4	549	-14	2.1	N	4	786		9.2		4	549	-14	2.1	N
12	P		3	553±59	11%	16%		2	292	-4.4	2.2	N	2	292	-4.4	2.2	N	2	292	-4.4	2.2	N
13	S		6	845±50	5.9%	14%		2	664	-3.6	10	N	2	664	-3.6	10	N			NE		
14	Cl		6	844±109	13%	25%		1	0	-7.7	3.2	N	1	0	-7.7	3.2	N	5	0	-7.7	4.0	N
15	K		11	673±46	6.9%	20%		1	0	-15	9.6	N	1	0	-15	9.6	N			NE		
16	Ca		7	405±34	8.4%	21%		0	0	-12	12	N	1	12	-12	7.0	N			NE		
17	Ti		10	1607±82	5.1%	11%		0	0	-20	20	N	3	0	-20	20	N			NE		
18	V	15%(1)	18	1389±52	3.8%	8.4%	Y	6	6.8	-27	21	N	6	6.8	-27	21	N			NE		
19	Cr	10%(1)	13	1476±41	2.8%	6.4%	Y	13	1417	-1.4	3.4	YN	13	1417	-1.4	3.4	YN	7	88	-34	17	N
	^{52}Cr		11	1591±34	2.1%	4.7%	Y(?)	11	1488	-3.0	2.5	N	11	1488	-3.0	2.5	N	5	78	-45	24	N
20	Mn	10%(1)	15	1988±55	2.7%	7.7%	Y	13	1459	-9.6	2.0	N	13	1459	-9.6	2.0	N			NG		
21	Fe	10%(1)	14	1848±68	3.4%	8.7%	Y	14	1233	-9.0	4.7	N	14	1233	-9.0	4.7	N	0	0	-29	29	N
	^{56}Fe		16	1423±37	2.6%	7.1%	Y(?)	13	1373	-1.4	1.8	YN	13	1373	-1.4	1.8	YN	0	0	-38	38	N
	^{57}Fe		4	212±24	12%	24%																
22	Co		12	877±45	5.2%	13%		6	69	-18	6.4	N	6	69	-18	6.4	N			NE		

N	Element	WRENDA Request (Priority)	Estimated Experiment					FENDL-1/E					ENDF/B6					BROND-2				
			Nγ	σ ± Δσ (mb)	Δσ/σ	ΔS/S	Status	Nγ	σ (mb)	Qtot	Qdif	Status	Nγ	σ (mb)	Qtot	Qdif	Status	Nγ	σ (mb)	Qtot	Qdif	Status
23	Ni	10%(1)	11	937±49	5.2%	15%	YN	9	143	-16	2.5	N	9	143	-16	2.5	N	0	0	-19	19	N
24	Cu	10%(1)	11	853±55	6.5%	19%	YN	11	411	-8	4.1	N	11	411	-8	4.1	N	4	443	-7.5	0.7	N
25	Ge	10%(2)	4	185±42	23%	35%	N		NE					NGE						NE		
26	Zr		0	No Exp										NGE				0	0	-43	43	N
27	Nb	10%(1)	15	1825±42	2.3%	7.8%	Y(?)	0	0	-43	43	N	0	0	-43	43	N	0	0	-35	35	N
28	Mo	15%(1)	24	1634±47	2.9%	11%	Y(?)	0	0	-35	35	N	0	0	-35	35	N			NGE		
29	Sn		0	No Exp	-	-			NGE					NGE						NGE		
30	I	10%(1)	2	333±28	8.5%	11%	Y(?)		NE				0	0	-12	12	N			NGE		
31	Cs	10%(2)	0	No Exp					NE					NGE						NE		
32	Ba		0	No Exp				0	0				0	0								
33	Ta		0	No Exp																		
34	W		0	No Exp																		
35	Pb		12	3138±248	7.9%	21%		10	2063	-4.3	1.4	N	10	2063	-4.3	1.4	N	9	275	-12	4.5	N
	^{208}Pb		14	2159±65	3.0%	8.7%		6	2603	+6.8	14	N	6	2603	+6.8	14	N	5	305	-29	2.0	N
36	Bi	10%(1)	9	1489±147	10%	24%	YN	0	0	-10	10	N	5	40	-10	10	N	6	71	-10	1.7	N

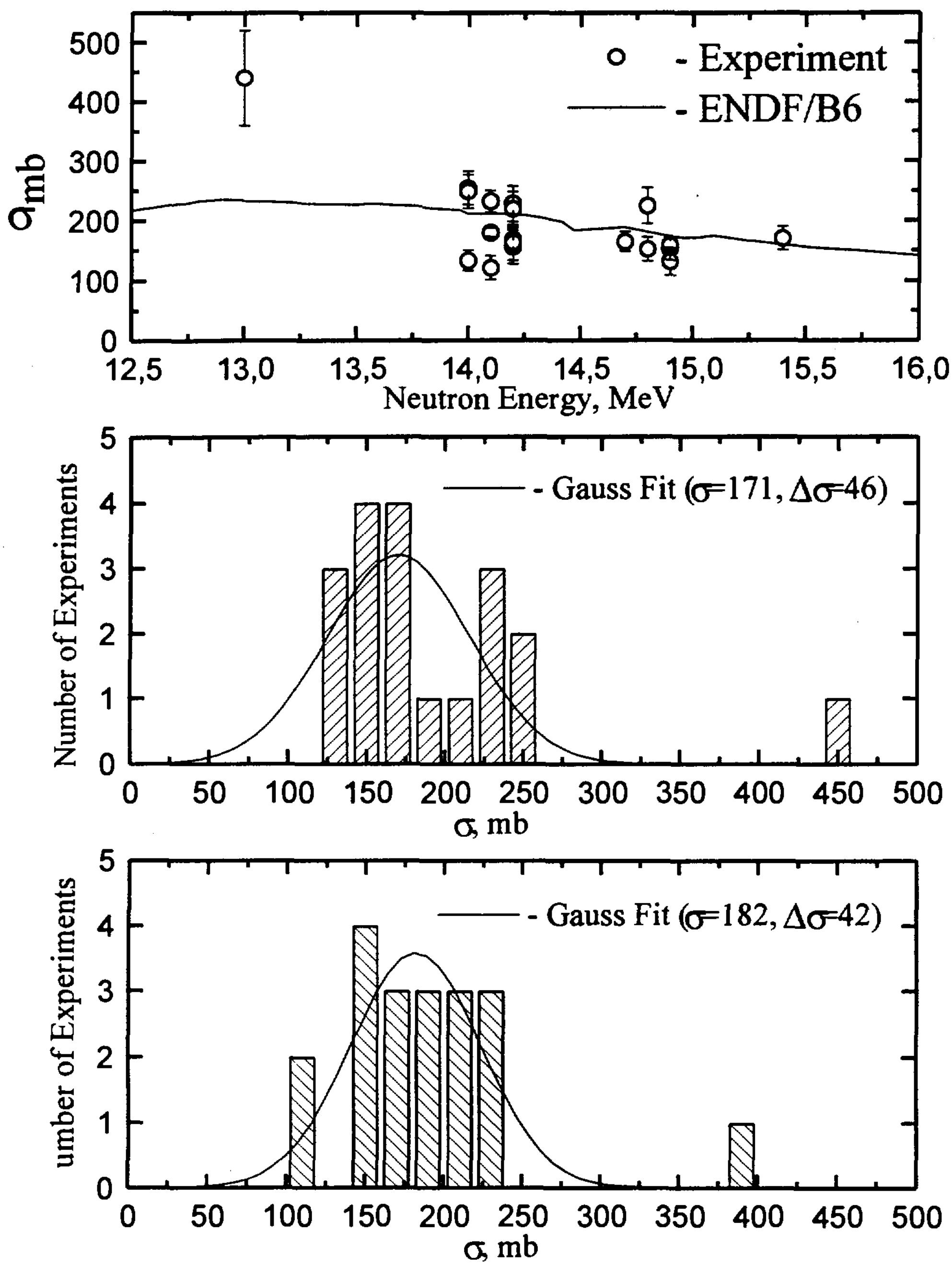

Fig. 1. Production of 4439 keV γ-ray in C(n,n') reaction: top – energy dependence of cross section; middle - distribution of original experimental results; bottom part - distribution of experimental results after applied corrections.

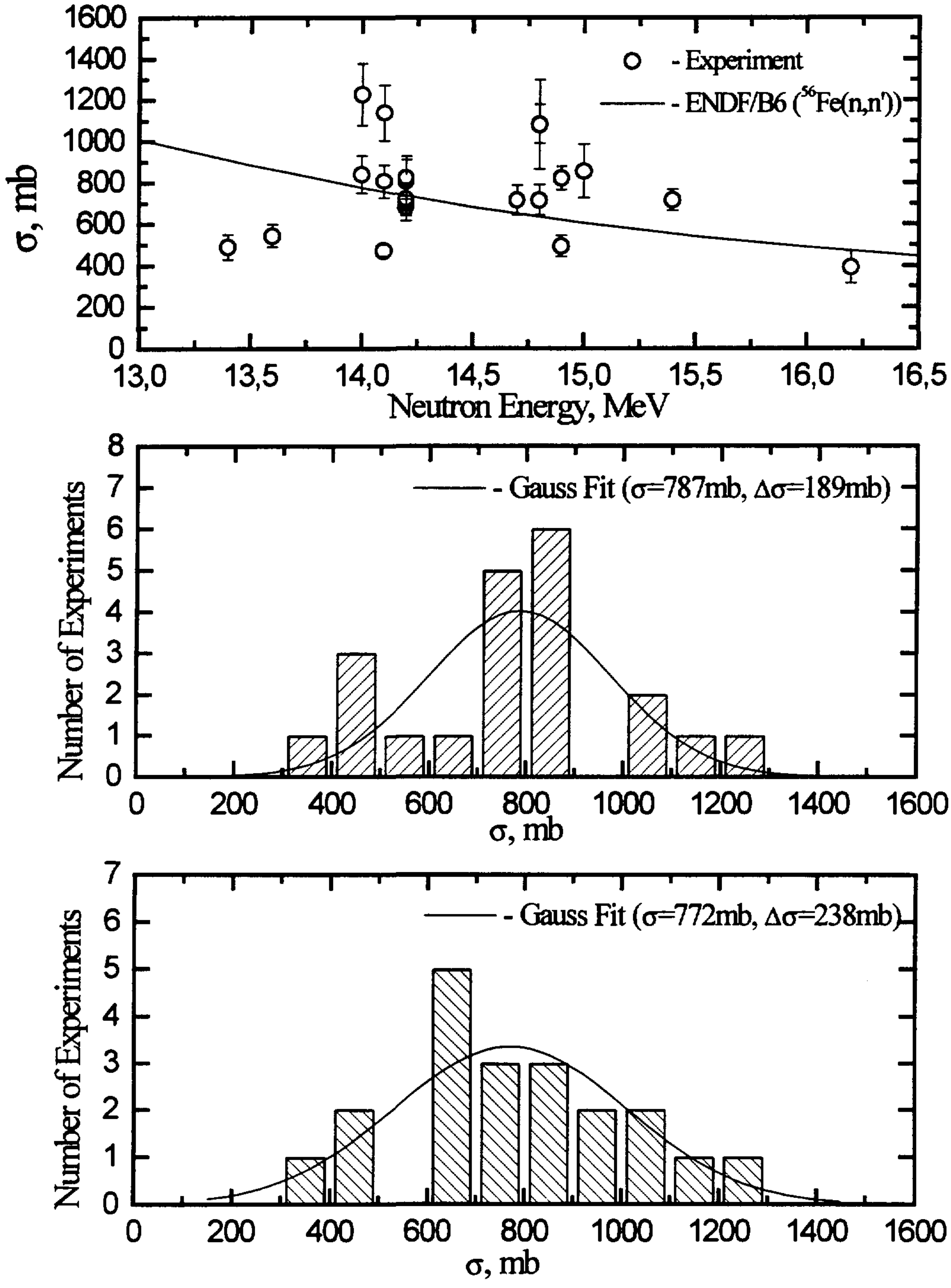

Fig. 2. Production of 847 keV γ-ray in Fe(n,n') reaction: top - energy dependence of cross section; middle - distribution of original experimental results; bottom part - distribution of experimental results after applied corrections.

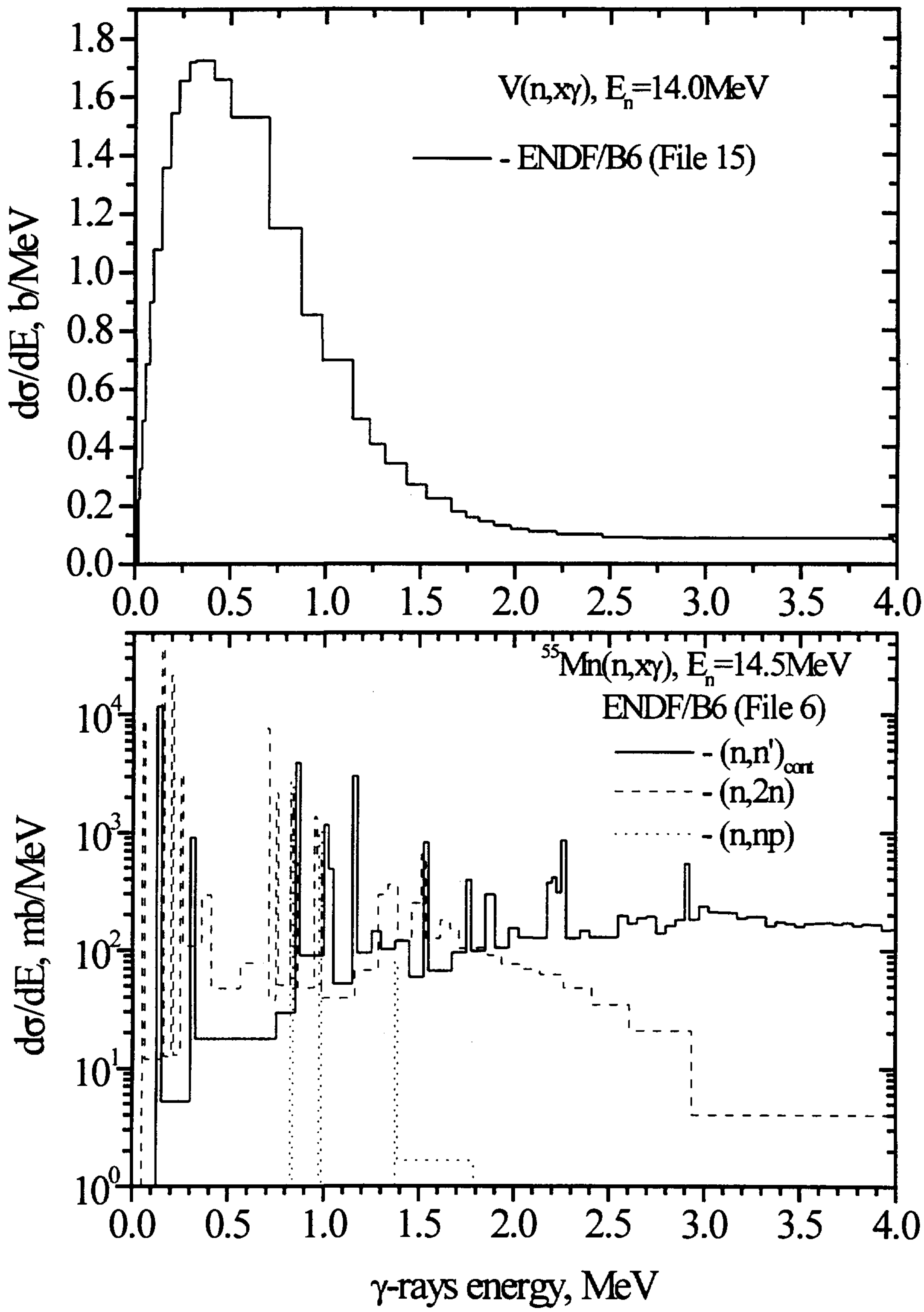

Fig. 3. The two type of energy continuos photon production spectra: smoothed (upper) and complex (down).

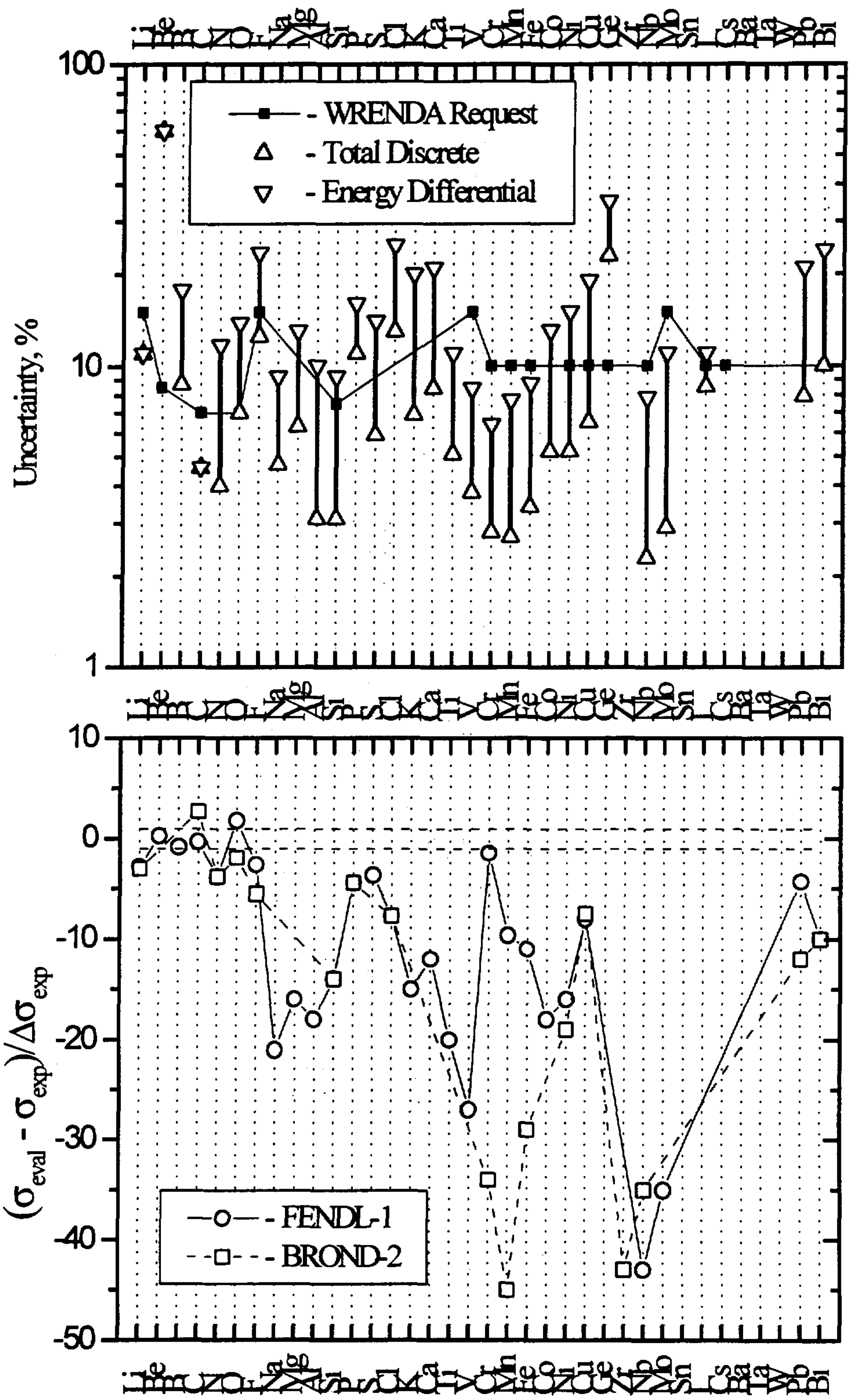

Fig. 4. Status of experimental data against WRENDA request (top) and evaluated data against experimental ones (bottom).

Nuclear Data Section
International Atomic Energy Agency
P.O. Box 100
A-1400 Vienna
Austria

e-mail: services@iaeand.iaea.or.at
fax: (43-1)26007
cable: INATOM VIENNA
telex: 1-12645 atom a
telephone: (43-1)2600-21710

online: TELNET or FTP: iaeand.iaea.or.at
username: IAEANDS for interactive Nuclear Data Information System
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