Atomic Data and Nuclear Data Tables xxx (xxxx) xxx

Contents lists available at ScienceDirect

Atomic Data and Nuclear Data Tables

journal homepage: www.elsevier.com/locate/adt

Experimental cross sections for K-shell ionization by electron impact

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ARTICLE INFO

Keywords:
Ionization cross section
Electron incidence
K shell
Experimental
Compilation

ABSTRACT

A comprehensive compilation of experimental K-shell ionization cross sections induced by electron impact has been assembled, including results up to December 2024. The data are organized according to the target atomic number and to the incident electron energy for elements ranging from H to U. From the 2509 reported data, more than 50% pertain only to 8 elements (H, He, Ar, Cr, Fe, Ni, Cu, and Ag). Conversely, 13 elements have only one or two results, and no data is available for 27 elements in the range of atomic numbers considered. Additionally, a further inspection of the database reveals that the majority of the data is concentrated within a small energy range, spanning up to four times the K-shell ionization energy. Finally, the different methods used to measure the ionization cross section are analyzed and a discussion about the main sources of uncertainties is presented.

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https://doi.org/10.1016/j.adt.2025.101756
Received 19 June 2025; Received in revised form 1 August 2025; Accepted 2 August 2025

Contents

1. Introduction

The ionization cross section σ_K for the K shell is a relevant parameter in different fields of physics, such as atomic, plasma, and radiation physics. In particular, for electron incidence, several materials characterization techniques depend on the knowledge of this magnitude; this is the case for electron probe microanalysis (EPMA), Auger electron spectroscopy (AES), and electron energy-loss spectroscopy (EELS).

The experimental determination of inner-shell ionization cross sections by electron impact can be accomplished using different methods: by counting the ions or secondary electrons produced by the incident beam (used exclusively for H and He), or by spectroscopic techniques involving X-ray and Auger emissions, and energy loss experiments [1]. The targets employed can be gaseous or solid; the latter include thin films, either self-supported or deposited on substrates, and bulk samples. Depending on the method used, in some cases the ionization cross section must be derived from the X-ray production cross section (σ_K^X), which is the product of σ_K and the K-shell fluorescence yield ω_K. Since the K shell is the innermost atomic level, any dependence of the corresponding ionization cross section on the molecular environment or on the physical state of the target is generally not taken into account. Nevertheless, this effect could modify the ionization cross section for light elements, for which the K shell could be more affected by molecular orbitals.

Despite the great effort devoted to the subject for almost a century, the dependence of σ_K on the atomic number Z and on the kinetic energy E of the incident electron cannot be fully described. Significant discrepancies are found among sets of experimental determinations from different authors, and between experiment and predictions [2]. The evaluation of theoretical models requires a comprehensive database, including all the experimental cross-section values reported up to date. In 1990, Long et al. [3] compiled experimental data existing up to December 1989. In a new review, Liu et al. [4] added data up to December 1999. These reviews tabulate numerical data reported in the original publications and a few data obtained from private communications; they also record the existence of graphical data (not included in the tabulations). Fourteen years later, in an extensive work, Llovet et al. [2] updated the K-shell ionization database with measurements reported up to December 2013, presenting the data in a comprehensive set of plots. It is worth mentioning that these authors also compile data for L- and M-shell ionization and Lα X-ray production cross sections, and make comparisons with different theoretical approaches. However, the numerical data are not included in that publication. It is desirable to have an updated database with the cross-section numerical values, including those reported in the last 10 years.

In the present work, an exhaustive search for experimental values of K-shell ionization cross sections by electron impact was performed. A new database was created that includes numerical values, increasing the number of data reviewed in previous compilations from 1953 to 2509. Some particular cases were analyzed, and the experimental values were compared with the theoretical predictions performed by Bote et al. [5].

2. Experimental methods

There are different experimental methods for determining the K-shell ionization cross section. Some of them are summarized below.

2.1. Ions and secondary electrons

For hydrogen and helium, these magnitudes are obtained from the measurement of the number of H^+ or He^+ ions, or secondary electrons produced by interactions with the incident beam, since the ionization can only occur in the K shell. In this case, the K-shell ionization cross section can be written as [6]:

$$\sigma_K = \frac{N}{k\delta'}, \tag{1}$$

where N is the number of ions (or secondary electrons) detected per incident electron, δ' is the number of target atoms per unit area, and k accounts for the detection efficiency of particles or secondary electrons. This expression is valid for the beam-static-target technique. Instead, for the crossed-beams technique, the previous expression becomes more complicated and includes the beam velocities, and the detection of neutral atoms [7]. The main source of uncertainties in this last case corresponds to the detection efficiency, estimated as 5%, which leads to a final uncertainty of around 6%–7% for incident energies between 30 and 750 eV. For the remaining elements, the K-shell ionization cross sections have been determined from measurements of X-ray yields, Auger electron yields, or EELS spectra, using different kinds of targets.

2.2. X-rays

In the case of X-rays, the number of detected K-line photons N_x can be written as:

$$N_x = f(\sigma_K)\, N_e\, \varepsilon\, \frac{\Delta\Omega}{4\pi}\, \omega_K, \tag{2}$$

where the first factor is a function of the K-shell ionization cross section that depends on the type of sample. This expression includes the contribution of Kα and Kβ lines; if only one of them is considered, it must be multiplied by the corresponding relative transition probability.

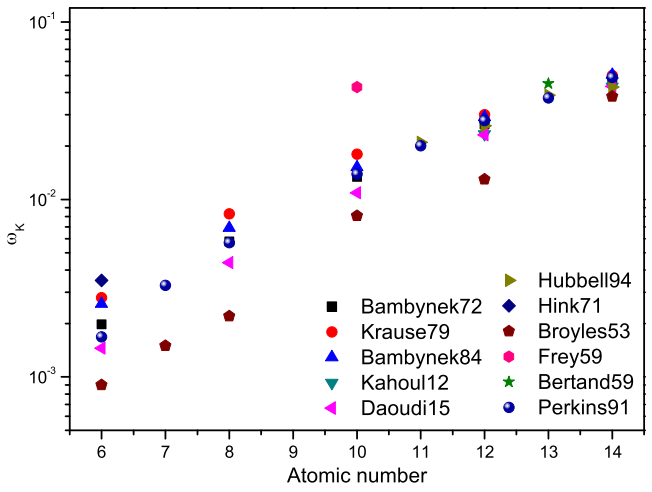

Fig. 1. K-shell fluorescence yield for low atomic numbers taken from Bambynek et al. [12,13], Krause et al. [14], Kahoul et al. [15], Daoudi et al. [16], Hubbell et al. [10], Hink and Paschke [17], Broyles et al. [18], Frey et al. [19], Bertrand et al. [20], and Perkins et al. [21].

In addition, to determine the single ionization cross section, N_X should exclude the photons originating in direct multiple ionizations, which is usually not properly done. Fortunately, these are low-probability events for the K shell, as suggested by the weak energy satellite lines associated with this effect. A possible exception may occur for low-Z elements ($Z < 15$), for which this probability can reach around 10% of the single-ionization probability (see, *e.g.*, [8]).

The remaining factors in Eq. (2) correspond to the number of incident electrons N_e, the intrinsic detector efficiency ε, the solid angle fraction subtended by the detector $\Delta\Omega/4\pi$, and the fluorescence yield ω_K. The uncertainties associated with these parameters have been studied in several situations, and it has been found that the uncertainty in the number of incident electrons is lower than 1%, and for the solid angle fraction it is around 5% [9]. Regarding intrinsic detector efficiency ε, it is a function of the photon energy that drops sharply at low energies, and it depends on the nature of the detector. There are several methods to determine it, for example, by using radioactive sources or by comparing measured and predicted spectra. In the case of K lines of light elements ($Z < 12$), ultra-thin-window X-ray detectors are typically employed, which exhibit an efficiency with significant jumps at the absorption edges of the elements contained in the window. The resulting uncertainties in the detector efficiency for energy dispersive spectrometers were estimated to be around 10% in the energy range between the C-K and O-K lines. These uncertainties decrease with increasing photon energies, being around 1% for Al-Kα and Si-Kα and 0.2% for Ti-Kα [9].

Regarding the fluorescence yield, the uncertainties in the experimental values for ω_K range from about 10% for $Z = 11$ to approximately 1% for $Z = 80$ and above [10]. According to a more recent work [11], the discrepancy between different theoretical, semiempirical and experimental sources is even greater for lower atomic numbers, where ω_K has a very small value (see Fig. 1).

The function $f(\sigma_K)$ in Eq. (2) depends on the kind of target used for the determination of σ_K. In the case of self-supported thin targets, it is assumed that the incoming electrons follow a linear path within the sample without energy loss. Thus, the following relationship can be written:

$$f(\sigma_K) = \sigma_K \delta t \,, \tag{3}$$

where δ is the target atomic density (number of atoms per volume unit) and t is its thickness. If the film is not thin enough, corrections to account for non-linear paths and the energy loss suffered by the electrons within the material must be performed. The main source of uncertainties in Eq. (3) is related to the number of atoms per unit area of the film, given by the product δt. These uncertainties can be estimated between 5% and 30%, depending on the characteristics of the film and the technique used to measure its thickness [22–24]. Films can have problems of uniformity, for example, by clustering of matter. To reduce these effects, films can be supported on light substrates (*e.g.* carbon, mylar or aluminum). In this case, the X-ray enhancement due to the contribution of the electrons backscattered from the substrate must be taken into account.

When diluted gases are used as targets, Eq. (3) can also be applied. In this case, the number of atoms per unit area, δt, depends on pressure and temperature, and can be determined with a high degree of precision (2%) [25]. For this kind of target, another method, based on the measurement of characteristic and bremsstrahlung emissions, can be used to cancel out certain experimental parameters [26], which leads to:

$$N_x = \sigma_K \frac{N_b}{4\pi} \left(\frac{d^2\sigma_b}{d\Omega\, dE} \right)^{-1} \frac{1}{\Delta E}\, \omega_K \,, \tag{4}$$

where N_b is the measured bremsstrahlung intensity, $\frac{d^2\sigma_b}{d\Omega\, dE}$ is the double differential bremsstrahlung cross section, and ΔE is an energy interval centered at the photon energy. The main source of uncertainties of this method is around 10%, and corresponds to the bremsstrahlung cross section [27].

For thick targets, the situation is more complex due to the deflection and energy loss of the electrons within the sample. This problem can be overcome by means of the integral-differential method [28], where two assumptions are made: on the one hand, the incident electron describes a linear path within the sample, and on the other hand, the emissions generated by secondary particles are negligible. In this formalism, the function $f(\sigma_K)$ in Eq. (2) can be written as

$$f(\sigma_K) = \frac{\omega_K N_0}{A} \int_0^R \sigma_K(E(\rho x)) \exp\left[-\mu_x \frac{\cos\alpha}{\cos\beta} \int_0^{\rho x} d(\rho x') \right] d(\rho x) \,, \tag{5}$$

where N_0 is the Avogadro number, A is the atomic mass, R is the range for the electrons with energy enough to ionize the level of interest, ρx is the mass length traveled by the electrons, μ_x is the mass attenuation coefficient for the characteristic X-rays inside the target, and α and β are, respectively, the incident and exit angles measured with respect to the normal of the sample surface. In terms of the stopping power $S(E) = -dE/d(\rho x)$, and using the Leibniz's rule for differentiation, σ_K can be cleared from Eq. (5) [29]:

$$\sigma_K = \frac{A}{\omega_K N_0} \frac{4\pi}{\Delta\Omega\epsilon} \left[S \frac{d}{dE} \left(\frac{N_x}{N_e} \right) + \frac{N_x}{N_e} \mu_x \frac{\cos\alpha}{\cos\beta} \right] . \tag{6}$$

When this method is used to determine the ionization cross section, error estimation becomes a difficult task. For example, Pérez et al. [29] gave estimations between 5 and 11% for the σ_K uncertainties in silicon, although no error was assumed in the two approximations abovementioned.

2.3. Auger electrons

The measurements of σ_K based on Auger spectroscopy have been performed on gaseous targets. In this case, the intensity of Auger electrons can be written as

$$N_A = \sigma_K N_e \delta' [\epsilon' \Delta\Omega/4\pi](1 - \omega_K) \,, \tag{7}$$

where ϵ' accounts for the efficiency of the detection system, including both the transmission of the analyzer and the intrinsic detector efficiency; $\Delta\Omega$ is the solid angle subtended by the analyzer; and N_e, δ', and ω_K are defined above. Auger spectroscopy is particularly useful for determining σ_K for atoms with inner-shell binding energies less than about 1 keV (with characteristic X-ray energies near or below the detection limits), and for which ω_K is small, *i.e.*, the Auger yield

$(1 - \omega_K)$ is close to unity. The main sources of uncertainties in this method are the density δ' and the detection efficiency. Glupe and Melhorn [30] report total uncertainties of 5% (3% due to density, 2% from counting statistics, and 2% originated in the detection procedure). Similar uncertainties are reported by Hink et al. [31] for measurements with large enough incident electron energies, but they increase when decreasing the this magnitude, down to values close to the K-shell ionization energy. Platten et al. [32] and Quarles and Semaan [33] report uncertainties between 10 and 20%.

2.4. EELS

Electron energy-loss spectroscopy is widely applied for thin-film analysis in transmission electron microscopy, and has been used for determining the ionization cross section of some elements. The energy spectrum of electrons transmitted reveals structures that can be associated with core-electron excitations, similarly to X-ray absorption spectroscopy. For a thin film of thickness t and atomic density δ, the relation between the measured intensity N_E corresponding to energy losses associated with K-shell ionization and the total transmitted intensity N_T within a semiangle α is given by [34]

$$N_E(\alpha) = N_T(\alpha)\delta t\sigma_K(\alpha), \tag{8}$$

where $\sigma_K(\alpha)$ is the partial ionization cross section, which tends to σ_K when α approaches a critical value. There are few works reporting measurements of σ_K with this technique [34–37], with uncertainties estimated between 6 and 20%.

3. The K-shell ionization cross-section database

The present database contains experimental K-shell ionization cross sections extracted from 103 publications covering the period 1930–2024, although no new experimental results were found after 2020. It includes 2509 data points, representing ionization cross-section values for 65 elements from H to U across the energy range 1.46×10^{-2} keV$< E < 2 \times 10^6$ keV. These data can be divided into three groups:

1. The data reviewed in the paper published by Llovet et al. [2], which represents the most recent compilation. These data (amounting to 1953 data points for 63 elements) were retrieved from the original articles.
2. Results published prior to 2014 not included in Llovet et al.'s work [2]. This group comprises 382 values, most of which correspond to H and He [38–51]. Also, data for Ar, Ca, Ti, V, Mn, Ni, Cu, Y, Ag, Sn, Te, Pt and Au [52–57] were found and integrated into the present database.
3. The measurements published after 2013, amounting 174 experimental values for Al, Si, Ti, Fe, Ni, Zn, Zr, Ag, Te, Ta, Au and Bi [29,58–64].

A summary of the information collected is shown in Table A, ordered by atomic number Z. For each element, details such as the energy range, experimental technique, target material, quantity of available data, and corresponding bibliographic source are documented. To facilitate identification of the references, a key code in the format AaXX is employed, where Aa represents the initials of the first author's surname and XX denotes the year of publication. The data compiled by Llovet et al. [2] are grouped into a single entry for each element, and the key references corresponding to groups 2 and 3 are written in boldface.

The collected data are presented in Table 1, and also can be found in the supplementary material file. For each element, the table includes the following values: E, the corresponding overvoltage U (defined as $U = E/I_K$, with I_K the K-shell ionization energy [65]), σ_K, and the reported uncertainty $\Delta\sigma_K$. In the few cases for which $\Delta\sigma_K$ was not found, an estimate is given by considering the main sources of uncertainties involved in the corresponding experiment. Also, the method and target used for the determination, as well as the year of publication, are recorded. In addition, it is indicated whether the original work reports the ionization cross section or the X-ray production cross section. The fluorescence yield ω_K is included whenever it has been reported by the authors. When only σ_K^X is provided, the σ_K value was recovered by using the reported ω_K. For the cases where σ_K^X is informed, but no ω_K value is given, the fluorescence yield was taken from Perkins et al. [21]. The last two columns of the table account for the reference key described above and to particular notes, clarifying certain entries.

A few discrepancies were found when comparing the recovered data with those presented by Llovet et al. [2]. In the case of Westbrook and Quarles data [56], who measured σ_K at 100 keV for a wide Z range and present the results in graphical form without specifying the targets used, the values retrieved by the present digitalization methodology for V, Y, and Sn were assigned by Llovet et al. [2] to Ti, Zr and Sb, respectively. The data for Ni, Ag, and Pt obtained from Scholz et al. [53], as well as those for Te from Westbrook and Quarles [56] were not included in Llovet et al. compilation [2]. Similarly, data for Sn given by Motz and Placious [66] are missing in the tables and plots published by Llovet et al. [2], although the authors mention them in the main text. Also, the work by Nagy et al. [51] for He is found neither in Table 2 nor in the text of Llovet et al. although a reference key "Na80" in their corresponding plot appears to be linked to that author.

The numerical data for the measurements of Clark [67], Berkner et al. [68] and Scholz et al. [53] were extracted from the tabulation given by Long et al. [3], who obtained the information by requesting it from the original authors. There are a few elements for which Scholz et al. [53] reported two values obtained with different detectors; these data were treated in this work as independent determinations and their values were digitalized from the original paper to be included in the database, rather than using the single value provided by Long et al. [3]

The dispersion and lack of experimental determinations for many elements and energy ranges hinder the systematization of the data through any form of analytical parameterization.

4. Discussion

A panorama of the distribution of the compiled data across the periodic table is shown in Fig. 2, where the number of data points for each element is indicated. It can be seen that 27 elements have no data available in the considered range of atomic numbers, while 13 elements have only one or two data points, most of which reported by few authors [53,56,69]. Conversely, around 52% of the data correspond to just 8 elements: H (7.9%), He (20.3%), Ar (3.7%), Cr (3%), Fe (3%), Ni (4.9%), Cu (4.5%), and Ag (4.6%). The scarcity of experimental values for some third-period elements – particularly Na, Mg, and P – is noteworthy, despite the fact that X-ray determinations for these elements do not pose significant challenges in terms of X-ray detection, sample availability, or access to electron sources with adequate energies for K-shell ionization.

Regarding the incident electron energies, it can be observed that over 50% of the data are concentrated within a narrow energy range, spanning up to $U \approx 4$ (see Fig. 3). Moreover, there are 695 data points with overvoltage $U < 2$, *i.e.*, almost 30% of the total set. Notice that, for E slightly above I_K, cross-section measurements have associated important uncertainties since, on the one hand, the X-ray emission is very weak due to the low ionization probability and, on the other hand, any error in the incident energy strongly affects σ_K due to its rapid increase with energy.

Excluding the data for H and He, mainly obtained by counting ions or secondary electrons, the 91% of the remaining measurements correspond to X-ray methods, which involve the use of the fluorescence yield ω_K to convert the number of detected photons into ionization cross section. This may introduce important uncertainties in the case of light elements (up to $Z \approx 10$) for which the ω_K values reported by different

Table A
Measurements of K-shell ionization cross sections published up to 2024. Information on the incident electron energy range, method and target used, and reference is given. Methods include: measurements with X-ray yields (X), Auger yields (A), EELS spectra (E), ion number (I), and secondary electron number (SE). Targets used include self-supporting thin films (T), thin films on substrates (TS), thin films on thin substrates (TtS), thick substrates (S), and gases (G). *vm*: various methods; *vt*: various targets. The key for references AaXX is explained in the text and is compatible with the tables given in the supplementary material file. Data added in the present compilation (groups 2 and 3) are indicated with reference in bold typeface.

Element	Energy range [keV]	Method/Target	Number of data	Refs.
H	0.014–4	*vm*/G	113	Sh87 [70], Sh92 [71]
H	0.019–0.752	I/G	37	**Fi58** [41]
H	0.100–0.718	I/G	11	**Ro62** [43]
H	0.7–20	I/G	26	**Sc65** [45]
H	0.1–0.6	I/G	10	**Sc66** [47]
He	0.02–1.6	I/G	291	Ra65 [6], Sc66 [47], Na80 [51], St80 [72], Mo84 [7], We87a [73], Sh88 [74], Re02 [75]
He	0.025–4.5	I/G	54	**Sm30** [38]
He	0.7–20	I/G	26	**Sc65** [45]
He	0.027–0.997	I/G	27	**Br78** [50]
He	0.025–0.1	I/G	36	**As63** [44]
He	0.025–0.08	I/G	18	**Do62** [42]
He	2.5–11	I/G	12	**Li34** [39]
He	0.024–1	I/G	12	**Ha56** [40]
He	0.566–0.984	I/G	5	**Ad66** [46]
He	0.5–2	I/G	14	**Ga67** [48]
He	4.085	I/G	1	**Sh75** [49]
C	0.29–80	*vm*/*vt*	72	Gl67 [76], Hi71 [17], Co72 [35], Is72 [36], Ta73 [77], Eg75 [37], Ro79 [34], Li12 [9]
N	0.85–25	*vm*/*vt*	45	Gl71 [30], Is72 [36], Ta73 [77]
O	1–25	*vm*/*vt*	54	Gl71 [30], Is72 [36], Ta73 [77], Pl85 [32], Li12 [9]
Ne	0.9–14.6	*vm*/G	67	Gl71 [30], Ta73 [77], Pl85[32], Hi81 [31]
Na	7×10^4–2.3×10^5	X/T	2	Ka80 [78]
Mg	1×10^4–2.3×10^5	X/T	5	Ho79 [25], Ka80 [78], Mc88 [79]
Al	2.5–2.3 × 10^5	*vm*/T	26	Hi69 [80], Is77 [69], Ho79 [25] , Ka80 [78], **We87b** [56], Mc88[79], Li12 [9]
Al	4–20	X/TS	30	**Me16** [60]
Al	5–27	X/S	10	**Li20** [63]
Si	2.5–1.5 × 10^5	*vm*/*vt*	32	Is77 [69], Ho79 [25], Pl85 [32], Sh94 [81], Zh09 [82], Li12 [9]
Si	2.1–20	X/S	14	**Pe15** [29]
S	7–30	X/TS	24	Wu10 [83]
Cl	6–2.7 × 10^5	X/*vt*	19	Is77 [69], Ka80 [78], Wu11 [84]
Ar	3.2–6 × 10^4	X/G	75	Ta73 [77], Ho79 [25], Qu82 [33], Hi82 [85] Hi83[86], Pl85[32], Si03[87]
Ar	3.5–11	X/G	9	**Ay07** [57]
Ar	4–11	X/G	8	**Do70** [52]
K	3.75–45	X/*vt*	30	Sh91 [88], Wu12 [89]
Ca	4.5–2.7 × 10^5	X/*vt*	45	Is77 [69], Ho79 [25], Sh91 [88], Wu10 [83]
Ca	100	X/T	1	**We87b** [56]
Sc	4.8–45	X/TS	14	An00[90]
Ti	5.6–50	X/*vt*	53	Je75[91], He97[92], An03[93], Li12[9]
Ti	3×10^5	X/T	1	**Wa87**[55]
Ti	7–27	X/S	9	**Li20** [63]
V	$5.9–2\times10^3$	X/*vt*	14	Sc72[53], An00[90]
V	100	X/T	1	**We87b** [56]
Cr	$6–6\times10^4$	X/*vt*	75	Sc72 [53], Ho79 [25], Lu96 [94], He97 [92], Ll00 [95], An03 [93]
Mn	3.5–5 × 10^4	X/*vt*	69	Fi67 [96], Sc72 [53], Ho79 [25], Sh80 [97], Lu97 [98], Ta99b [99], Ll02 [100]
Mn	3×10^5–3.5×10^5	X/T	2	**Wa87** [55]
Fe	$7.5–2\times10^3$	X/*vt*	59	Sc72 [53], He96a [101], Lu97 [98], Ll02 [100]
Fe	8.3–28	X/T	16	**Ti20** [64]
Co	$8.5–2\times10^3$	X/*vt*	10	Sc72 [53], An96 [102]
Ni	$8.9–2\times10^6$	X/*vt*	94	Sm45 [103], Po47 [104], Se74 [105], Je75 [91], Ho79 [25], Ge82 [106], Lu96 [94], He97 [92], Ll00 [95], An06 [107]
Ni	2×10^3	X/T	1	**Sc72** [53]
Ni	2.95×10^3–2.9×10^4	X/T	11	**Da75** [54]
Ni	9.3–28.2	X/T	16	**Ti20** [64]
Cu	$9–2\times10^6$	X/*vt*	111	Fi67 [96], Mi70 [108], Da72 [109], Hu72 [110], Sc72 [53], Is77 [69], Be78 [111], Ho79 [25], Sh80 [97], Sh81 [112], Ge82 [106], We87b [56], An96 [102], He97 [92], Ll00 [95], Zh01 [113]
Cu	3×10^5–3.5×10^5	X/T	2	**Wa87** [55]
Zn	10.3–1.5 × 10^5	X/*vt*	32	Sc72 [53], Is77 [69], Ta99a [114], Wu10 [83]

(*continued on next page*)

Table A (*continued*).

Element	Energy range [keV]	Method/Target	Number of data	Refs.
Zn	11.1–28.6	X/T	16	**Ti20** [64]
Ga	10.5–39	X/*vt*	48	Zh01 [113], Zh02 [115], Me06 [116]
Ge	11.2–6 × 10^4	X/*vt*	64	Ho79 [25], Sh81 [112], Ta02 [117], Zh02 [115], Me04 [118], Lu01 [119]
As	12–2 × 10^3	X/T	29	Sc72 [53], Me06 [116]
Se	13–1.5 × 10^5	X/*vt*	25	Fi67 [96], Sc72 [53], Is77 [69], Be78 [111], Ki81 [120], Lu01 [119]]
Br	2 × 10^3	X/T	1	[Sc72 [53]
Kr	2 × 10^4–6 × 10^4	X/G	5	Ho79 [25]
Rb	16–2 × 10^3	X/*vt*	12	Sc72 [53], Sh91 [88]
Sr	17–9 × 10^3	X/*vt*	17	Mi70 [108], Sc72 [53], Sh91 [88]
Y	17–2.7 × 10^5	X/*vt*	14	Se74 [105], Is77 [69], Ho79 [25], Lu01 [119]
Y	3 × 10^5–3.8 × 10^5	X/TS	3	**Wa87** [55]
Y	100	X/T	2	We87b [56]
Zr	18–1.4 × 10^3	X/*vt*	13	Ha64 [121], Zh02 [115]
Zr	20–27	X/TS	4	**Li20** [63]
Nb	20–34	X/TS	8	Pe98 [122]
Mo	21–9 × 10^5	X/*vt*	19	Mi70 [108], He96b [123], Ri77 [124]
Pd	300–7.1 × 10^5	X/T	8	Be70 [68], Is77 [69], Ri77 [124]
Ag	26–2 × 10^6	X/*vt*	80	Cl35 [67], Ha66 [125], Re66 [126], Fi67 [96], Da72 [109], Hu72 [110], Se74 [105], Sc76 [127], Ri77 [124], Ho79 [25], Ki81 [120], Sh81 [112], Ge82 [106], We87b [56], Sc93 [128], Zh01 [113]
Ag	2040	X/T	2	**Sc72** [53]
Ag	2.9 × 10^3–2.9 × 10^4	X/T	15	**Da75** [54]
Ag	3 × 10^5–3.8 × 10^5	X/T	3	**Wa87** [55]
Ag	51.5–100.8	X/T	14	**Va16** [61]
Cd	2040	X/T	1	Sc72 [53]
In	300–9 × 10^5	X/T	21	Mi70 [108], Sc72 [53], Is77 [69], Ri77 [124]
Sn	50–1.5×10^5	X/T	29	Fi67 [96], Ha64 [121], Re66 [126], Ha66 [125], Sc72 [53], Ri77 [124], Is77 [69], Ho79 [25]
Sn	50–500	X/T	4	**Mo64** [66]
Sn	3.8 × 10^5	X/TS	1	**Wa87** [55]
Sn	100	X/T	1	**We87b** [56]
Sb	60–2 × 10^3	X/T	9	Sc72 [53], Ki81 [120]
Te	2 × 10^3	X/T	1	Sc72[53]
Te	3 × 10^5–3.8 × 10^5	X/TS	2	**Wa87** [55]
Te	100	X/T	1	**We87b** [56]
Te	33–100	X/T	12	**Sa19** [62]
Xe	2 × 10^4–6 × 10^4	X/G	5	Sc72 [53]
Ba	100–2.7 × 10^5	X/T	6	Sc72 [53], Is77 [69], We87b [56]]
La	100; 2 × 10^3	X/T	2	[Sc72 [53], We87b [56]
Ce	2 × 10^3	X/T	2	Sc72 [53]
Pr	100; 2 × 10^3	X/T	2	Sc72 [53], We87b [56]
Nd	2 × 10^3	X/T	2	Sc72 [53]
Sm	2 × 10^3; 9×10^4	X/T	3	Sc72 [53], Is77 [69]
Eu	2 × 10^3	X/T	1	Sc72 [53]
Gd	2 × 10^3	X/T	1	Sc72 [53]
Tb	100	X/T	1	**We87b** [56]
Ho	2 × 10^4–9×10^4	X/T	3	Sc72 [53], Is77 [69]
Er	2 × 10^3	X/T	2	Sc72 [53]
Tm	3×10^5–9×10^5	X/T	6	Mi70 [108]
Yb	490–2 × 10^3	X/T	4	Sc72 [53], Se74 [105]
Ta	490–5 × 10^5	X/T	5	Mi70 [108], Se74 [105]
Ta	68–100	X/T	9	**Sa19** [62]
W	210–1.4 × 10^3	X/T	12	Ha64 [121], Ha66 [125]
Pt	2040	X/T	1	**Sc72** [53]
Au	90–9 × 10^6	X/T	37	Mo64 [66], Ha66 [125], Re66 [126], Be70 [68], Mi70 [108], Sc72 [53], Da72 [109], Se74 [105], Is77 [69], Ho79 [25], We87b [56]
Au	2.9 × 10^3–2.9 × 10^4	X/T	13	**Da75** [54]
Au	82–100	X/T	10	**Fe14** [58]
Au	89–100	X/T	2	**Ba15** [59]
Pb	240–9 × 10^4	X/T	16	Ha64 [121], Ha66 [125], Sc72 [53], Se74 [105], Is77 [69], Ho79 [25]
Bi	2 × 10^3–5 × 10^5	X/T	7	Mi70 [108], Sc72 [53], Is77 [69], Ho79 [25]
Bi	92–100	X/T	5	**Fe14** [58]
Bi	91–100	X/T	7	**Sa19** [62]
U	9 × 10^4	X/T	1	Is77 [69]

authors present large discrepancies. For instance, for C this parameter ranges from 0.0009 [129] to 0.0035 [17]. In addition, another effect that could introduce differences between theory and experiment for low atomic numbers is the chemical environment, which is not considered by theoretical formalisms. For heavier elements, the dispersion of the ω_K values is, in general, lower than 10%, and molecular effects are less important.

As mentioned in Section 2.2, direct multiple ionization events should be subtracted from the experimental counts to obtain ionization cross sections comparable with theoretical results. If this is not done

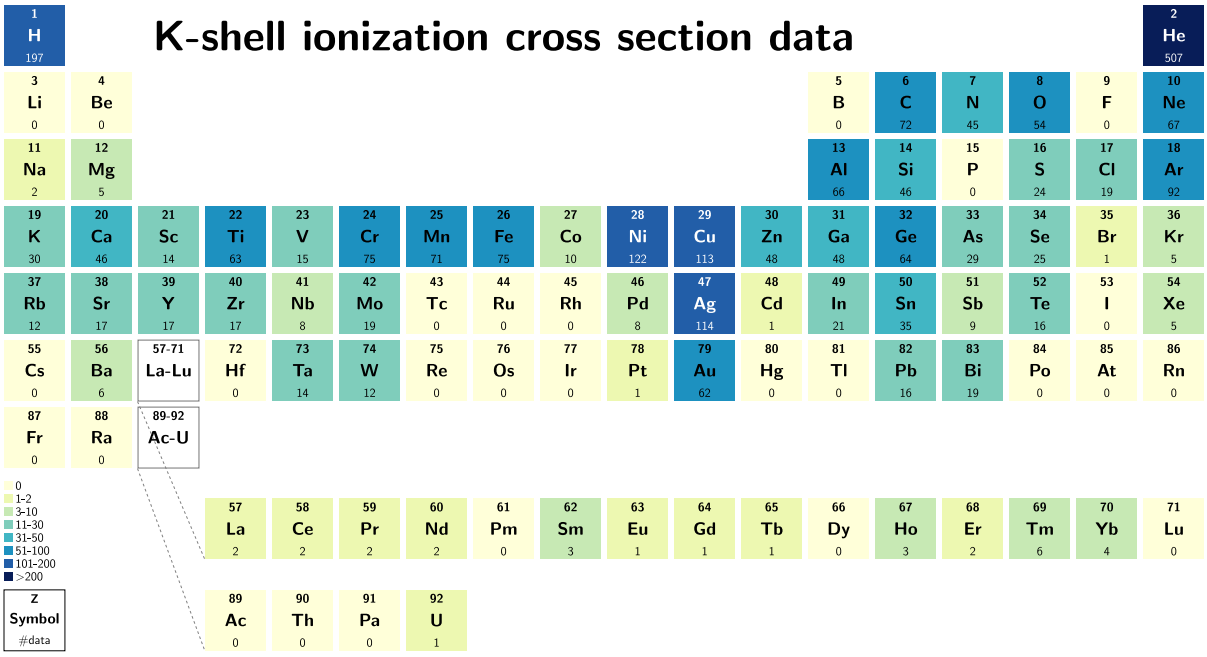

Fig. 2. Compiled K-shell ionization cross section measurements for each element along the periodic table for $1 \leq Z \leq 92$. The color scale identifies ranges of data numbers. The exact quantity of data found is given under the element's symbol.

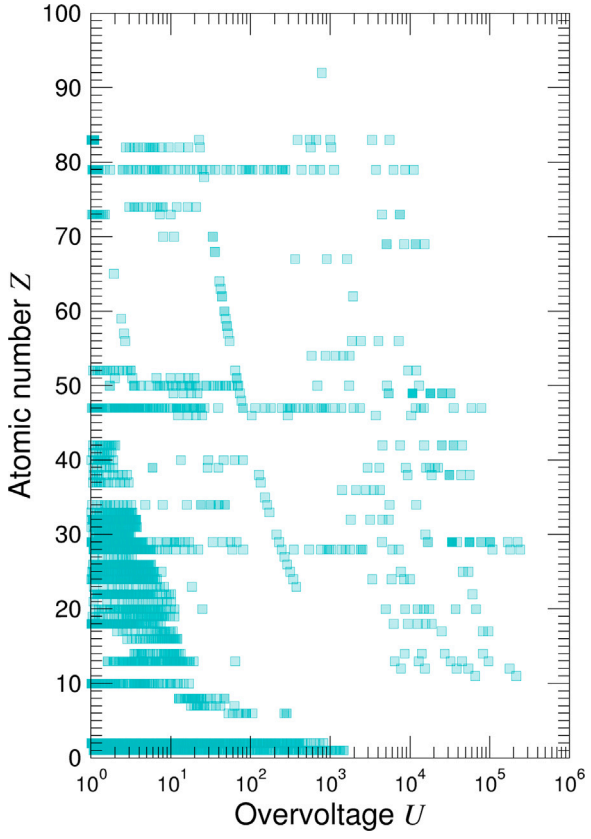

Fig. 3. Distribution of the compiled measurements for K-shell ionization cross section for each atomic number as a function of the overvoltage U. Each square represents one data point.

properly, the experimental data might lie above the theoretical curves, which should be more noticeable for low-Z elements, where the probability of direct multiple ionization is more significant. Unfortunately, no experimental data are available to account for this effect in the

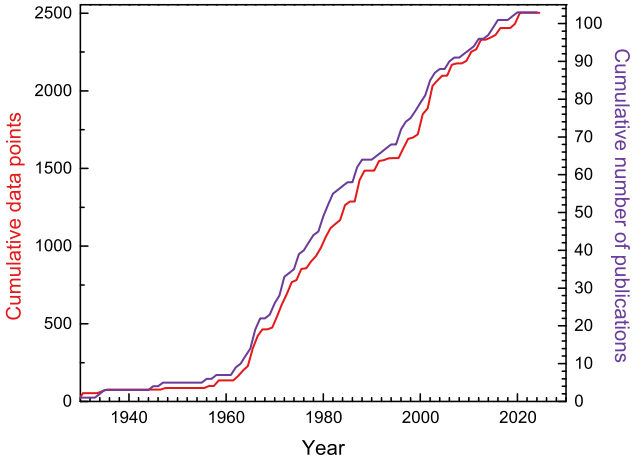

Fig. 4. Cumulative number of σ_K data points and publications along time.

case of Na and Mg. For Al, near the local maximum, it can be seen that the experimental points – particularly the more recent ones – are above the theoretical curve (see Fig. 5). For example, the data by Li et al. [63] in that region exceed the theoretical values by 12%, which is comparable to the probability of direct double ionization events reported by Limandri et al. [8] for elements with similar Z (17% for Mg and 7% for Si).

Analyzing the timeline of publications (see Fig. 4), the progression of experimental research on σ_K reveals distinct phases. The initial stage, from 1930 to 1960, featured only a few experiments, primarily focused on H and He. This was followed by a more active period between 1965 and 1990, during which approximately 240 data points were measured, with an average of 10 articles published per lustrum. In the subsequent decade, the publication rate dropped by half, but it increased again during the 2000–2006 period. Since then, the pace of publications has slowed, although certain elements and energy ranges remain unexplored.

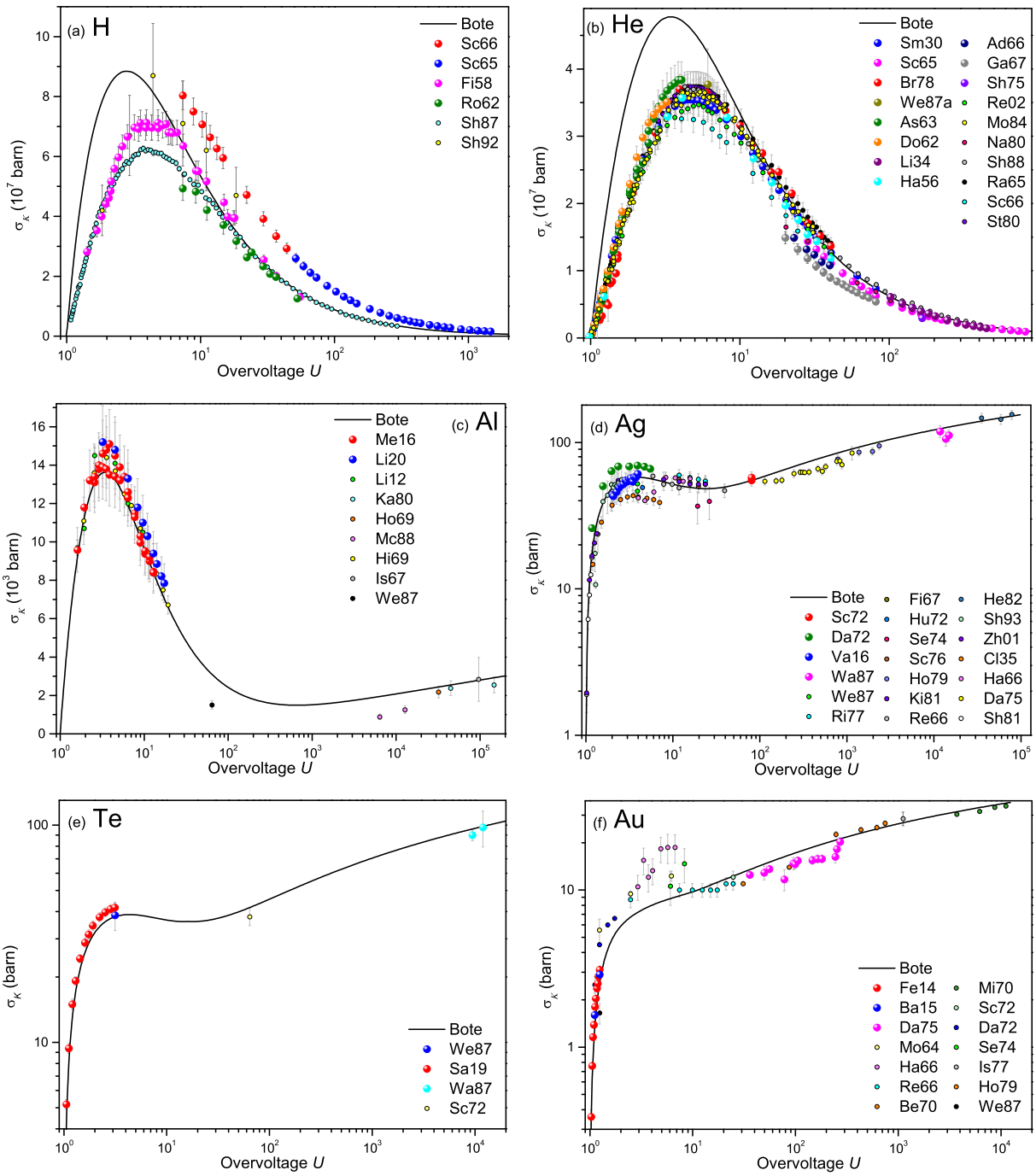

Fig. 5. Ionization cross section as a function of the overvoltage for different elements. The solid line represents the calculations performed by Bote et al. [5]. The experimental results not included in the compilation performed by Llovet et al. [2] (groups 2 and 3 defined in Section 3) are shown as large spheres, and the remaining data (group 1) are plotted as small circles and stars. (a): hydrogen, (b): helium, (c): aluminum, (d): silver, (e): tellurium, and (f): gold.

Fig. 5 shows the compiled data for σ_K as a function of the overvoltage U for selected elements. For comparison, predictions obtained with the parameterization given by Bote et al. [5] are included. This analytical model results from fitting numerical data obtained with the distorted-wave Born approximation (DWBA), for $U \leq 16$, and the plane wave Born approximation (PWBA) for higher overvoltages. It is worth noting that the values of U associated with the experimental data were determined by using I_K from a particular database [65]. According to the different tabulations for the ionization energy [65,130–132], differences in I_K of the order of 5 eV are observed, which implies relative uncertainties not higher than 2%.

For certain elements, a great dispersion is observed between different authors. However, in some cases the experiments present the same global behavior, similar to that described by the theoretical predictions. For instance, the energy of the local maximum for H cross section (at $U \approx 4$) can be clearly deduced from the data, although the σ_K values vary within 35% (see Fig. 5a). Another illustrative case is Ni, with a dispersion of 37% at $U \approx 3.6$. In other cases, determinations from different authors do not follow a clear trend. This is the case of Au for certain energy ranges (Fig. 5f), and other elements such as Sn and Pb. For some elements, instead, the experimental results present low dispersion; such is the case of Al illustrated in Fig. 5c). There are elements for which the compilation performed by Llovet et al. [2]

contains very few data, but with the values included in the present work it is possible to observe a definite behavior; such is the case of Te (Fig. 5e).

Regarding the relationship between the experimental and theoretical data, different situations can be pointed out. For H (Fig. 5a), there is a large amount of experimental data that show important discrepancies between the different sources. In this case, the theoretical assessment overestimates all of them for overvoltages below 3, *i.e.*, in the curve region at the left side of the maximum. For higher energies, the data published by Schram et al. [45,47] are quite above the general trend of both theoretical and other experimental data. For He (Fig. 5b), many data were found, which present much smaller discrepancies than for H. As can be seen, the theoretical predictions are in good agreement with experiments for $U > 10$, but seriously overestimate the data cloud for lower overvoltages. For S, only one set of measurements was found, which clearly differs from the DWBA formalism. With regard to Ag (Fig. 5d), Au (Fig. 5f), and Ni, the different experimental data sets present large discrepancies between them. However, the theoretical results follow the general trend. In the particular case of Au, some of the measurements show an unexpected outcome as compared to the general trend depicted by both the remaining experimental data and the theoretical curve.

5. Conclusions

The experimental K-shell ionization cross-sections by electron impact available in the literature up to 2024 were compiled to build a new database, increasing the number of previously compiled data in around 29%.

In addition, the different experimental methods used to determine the ionization cross-sections were discussed in detail, along with the main sources of uncertainties.

The compiled data present an important dispersion for several elements, in some cases even greater than the corresponding uncertainties, which are also included in the present dataset.

This compilation of K-shell ionization cross-section data allowed to perform a statistical analysis, which showed the lack of data for certain elements or energy regions. Therefore, this analysis can serve as a guide for researchers to perform new experimental determinations.

CRediT authorship contribution statement

S.P. Limandri: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **A.C. Carreras:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **J.C. Trincavelli:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **J.A. Guzmán:** Writing – review & editing, Validation, Methodology, Investigation, Data curation. **D.M. Mitnik:** Writing – review & editing, Validation, Supervision, Software, Methodology, Investigation, Formal analysis, Conceptualization. **C.C. Montanari:** Writing – review & editing, Validation, Supervision, Methodology, Formal analysis, Conceptualization. **S. Segui:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Supplementary data

The database is also openly available in https://www.famaf.unc.edu.ar/~trincavelli/database.html.

Note added in proof

Although the present compilation covers the data published up to December 2024, the authors acknowledge the publication of new data for the K-shell ionization cross section of Cu in the range 9–90 keV by Barros et al. [133].

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

The authors acknowledge the following institutions of Argentina for financial support: the Consejo Nacional de Investigaciones Científicas *y* Técnicas (CONICET), by the projects PIP 11220200100986CO and PIP 11220200102421CO, the Agencia Nacional de Promoción Científica *y* Tecnológica (ANPCyT), by the project PICT-2020-SERIE A-01931, and the Secretaría de Ciencia *y* Técnica de la Universidad Nacional de Córdoba, by the project 33620230100222CB.

Data availability

The data are available at a link specified in the manuscript.

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Explanation of Tables

Table 1. Measurements of K-shell ionization cross sections published up to Dec. 2024.
Nomenclature used:

Column	Title	Description
1	Z	Atomic number
2	Symbol	Element's symbol
3	I_K	K-shell ionization energy [65]
4	E	Incident electron energy in keV
5	U	Overvoltage (E/I_K)
6	σ_K	K-shell ionization cross section in barns
7	$\Delta\sigma_K$	Uncertainty of the ionization cross section (in barns) as reported by the author(s) unless specified in column 14 (Notes)
8	Method	A: Auger yields; E: EELS spectra; X: x-ray yields; I: ion number; SE: secondary electron number
9	Target	T: self-supporting thin films, TS: thin films on substrates, S: thick substrates, G: gases, TtS: thin films on thin substrate
10	Year	Year of publication
11	Reported datum	ICS: Ionization Cross Section; DICS: Differential Ionization Cross Section; XRP: X-ray Production cross section
12	ω_K	K-shell fluorescence yield as reported by the author(s).
13	Ref.	Key for locating the reference in Table 2
14	Notes	Comments on the data, uncertainties, or fluorescence yield values: ⋆ Digitalized from the original paper † Digitalized from Ki66 [134] ‡ Digitalized from **Na80** [51] # Uncertainties estimated considering similar experiments from other authors § Uncertainties interpolated from those given by the author(s) ⋈ ω_K taken from LLNL EADL report (Pe91) [21] ◇ Taken from the data tabulated in **Ay07** [57] ♡ Estimated energy below K binding energy ¶ Taken from table given in Lo90 [3]

Table 2. Key to references used in Tables A and 1.
Denoted with the first two letters of the first author surname followed by the last two digits of the year of their publication. References in bold typeface correspond to publications added for the present compilation.

Table 1
Measurements of K-shell ionization cross sections published up to Dec 2024.

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
1	H	0.0136	1.46E−02	1.07E+00	5.44E+06	2.5E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.48E−02	1.09E+00	6.61E+06	4.1E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.50E−02	1.10E+00	7.62E+06	3.8E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.51E−02	1.11E+00	8.20E+06	2.9E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.52E−02	1.12E+00	8.70E+06	4.5E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.54E−02	1.13E+00	9.90E+06	4.6E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.56E−02	1.15E+00	1.08E+07	3.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.59E−02	1.17E+00	1.25E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.61E−02	1.18E+00	1.37E+07	6.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.64E−02	1.21E+00	1.45E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.66E−02	1.22E+00	1.63E+07	3.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.69E−02	1.24E+00	1.68E+07	6.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.71E−02	1.26E+00	1.73E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.74E−02	1.28E+00	1.96E+07	6.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.76E−02	1.29E+00	2.07E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.79E−02	1.32E+00	2.15E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.81E−02	1.33E+00	2.22E+07	6.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.84E−02	1.35E+00	2.35E+07	3.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.87E−02	1.38E+00	2.50E+07	6.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.90E−02	1.40E+00	2.61E+07	4.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.93E−02	1.42E+00	2.82E+07	1.7E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	1.93E−02	1.42E+00	2.75E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.96E−02	1.44E+00	2.81E+07	4.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.00E−02	1.47E+00	2.93E+07	9.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.04E−02	1.50E+00	3.11E+07	1.0E+06	I	G	1987	ICS		Sh87	
1	H	0.0136	2.09E−02	1.54E+00	3.34E+07	2.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.14E−02	1.57E+00	3.39E+07	4.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.20E−02	1.62E+00	3.61E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.26E−02	1.66E+00	3.76E+07	9.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.28E−02	1.68E+00	3.53E+07	2.1E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	2.33E−02	1.71E+00	4.01E+07	6.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.40E−02	1.76E+00	4.15E+07	6.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.48E−02	1.82E+00	4.00E+07	2.4E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	2.48E−02	1.82E+00	4.30E+07	1.0E+06	I	G	1987	ICS		Sh87	
1	H	0.0136	2.50E−02	1.84E+00	4.20E+07	8.4E+06	SE	G	1992	ICS		Sh92	
1	H	0.0136	2.56E−02	1.88E+00	4.44E+07	1.0E+06	I	G	1987	ICS		Sh87	
1	H	0.0136	2.65E−02	1.95E+00	4.41E+07	2.6E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	2.66E−02	1.96E+00	4.57E+07	1.0E+06	I	G	1987	ICS		Sh87	
1	H	0.0136	2.73E−02	2.01E+00	4.75E+07	7.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.81E−02	2.07E+00	4.62E+07	2.8E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	2.83E−02	2.08E+00	4.95E+07	9.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.89E−02	2.13E+00	4.85E+07	2.9E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	2.91E−02	2.14E+00	5.17E+07	3.1E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	2.93E−02	2.15E+00	5.01E+07	6.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	3.05E−02	2.24E+00	5.10E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	3.09E−02	2.27E+00	5.59E+07	3.4E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	3.16E−02	2.32E+00	5.27E+07	7.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	3.28E−02	2.41E+00	5.39E+07	8.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	3.30E−02	2.43E+00	5.97E+07	3.6E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	3.41E−02	2.51E+00	5.53E+07	3.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	3.54E−02	2.60E+00	6.34E+07	3.8E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	3.54E−02	2.60E+00	5.59E+07	7.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	3.67E−02	2.70E+00	5.74E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	3.81E−02	2.80E+00	5.83E+07	6.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	3.85E−02	2.83E+00	6.66E+07	4.0E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	3.96E−02	2.91E+00	5.78E+07	7.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	4.00E−02	2.94E+00	6.70E+07	1.3E+07	SE	G	1992	ICS		Sh92	
1	H	0.0136	4.12E−02	3.03E+00	5.89E+07	4.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	4.29E−02	3.15E+00	6.02E+07	7.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	4.35E−02	3.20E+00	6.97E+07	4.2E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	4.47E−02	3.29E+00	6.07E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	4.66E−02	3.43E+00	6.08E+07	9.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	4.68E−02	3.44E+00	6.92E+07	4.2E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	4.84E−02	3.56E+00	7.12E+07	4.3E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	4.86E−02	3.57E+00	6.23E+07	6.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	5.07E−02	3.73E+00	6.27E+07	8.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	5.29E−02	3.89E+00	6.96E+07	4.2E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	5.29E−02	3.89E+00	6.19E+07	7.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	5.35E−02	3.93E+00	7.13E+07	4.3E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	5.52E−02	4.06E+00	6.23E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	5.76E−02	4.24E+00	6.21E+07	6.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	5.86E−02	4.31E+00	6.97E+07	4.2E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	5.86E−02	4.31E+00	6.96E+07	4.2E+06	I	G	1958	ICS		**Fi58**	⋆

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
1	H	0.0136	6.00E−02	4.41E+00	8.70E+07	1.7E+07	SE	G	1992	ICS		Sh92	
1	H	0.0136	6.01E−02	4.42E+00	6.13E+07	1.0E+06	I	G	1987	ICS		Sh87	
1	H	0.0136	6.30E−02	4.63E+00	6.14E+07	7.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	6.53E−02	4.80E+00	7.13E+07	4.3E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	6.55E−02	4.82E+00	6.94E+07	4.2E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	6.60E−02	4.85E+00	6.11E+07	4.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	6.90E−02	5.07E+00	6.11E+07	6.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	7.08E−02	5.21E+00	7.04E+07	4.2E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	7.21E−02	5.30E+00	6.01E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	7.50E−02	5.51E+00	7.08E+07	4.2E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	7.55E−02	5.55E+00	5.96E+07	8.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	7.81E−02	5.74E+00	6.80E+07	4.1E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	7.95E−02	5.85E+00	5.91E+07	9.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	8.12E−02	5.97E+00	6.82E+07	4.1E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	8.37E−02	6.15E+00	6.78E+07	4.1E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	8.40E−02	6.18E+00	5.84E+07	7.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	8.90E−02	6.54E+00	5.78E+07	9.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	9.05E−02	6.65E+00	6.80E+07	4.1E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	9.40E−02	6.91E+00	5.59E+07	8.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.00E−01	7.35E+00	7.10E+07	1.4E+07	SE	G	1992	ICS		Sh92	
1	H	0.0136	1.00E−01	7.35E+00	8.04E+07	4.8E+06	I	G	1966	ICS		**Sc66**	
1	H	0.0136	1.00E−01	7.36E+00	4.93E+07	3.9E+06	I	G	1962	ICS		**Ro62**	⋆
1	H	0.0136	1.01E−01	7.41E+00	6.36E+07	3.8E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	1.02E−01	7.50E+00	5.40E+07	7.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.03E−01	7.57E+00	5.42E+07	4.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.13E−01	8.31E+00	5.23E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.20E−01	8.82E+00	7.50E+07	4.5E+06	I	G	1966	ICS		**Sc66**	
1	H	0.0136	1.21E−01	8.90E+00	5.07E+07	8.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.25E−01	9.17E+00	4.83E+07	3.9E+06	I	G	1962	ICS		**Ro62**	⋆
1	H	0.0136	1.25E−01	9.20E+00	5.52E+07	3.3E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	1.30E−01	9.57E+00	5.05E+07	6.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.30E−01	9.58E+00	5.51E+07	3.3E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	1.38E−01	1.02E+01	4.83E+07	4.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.40E−01	1.03E+01	7.07E+07	4.2E+06	I	G	1966	ICS		**Sc66**	
1	H	0.0136	1.48E−01	1.09E+01	4.62E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.50E−01	1.10E+01	6.20E+07	1.2E+07	SE	G	1992	ICS		Sh92	
1	H	0.0136	1.50E−01	1.11E+01	5.17E+07	3.1E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	1.51E−01	1.11E+01	4.21E+07	3.4E+06	I	G	1962	ICS		**Ro62**	⋆
1	H	0.0136	1.58E−01	1.16E+01	4.55E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.60E−01	1.18E+01	6.64E+07	4.0E+06	I	G	1966	ICS		**Sc66**	
1	H	0.0136	1.68E−01	1.24E+01	4.43E+07	8.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.78E−01	1.31E+01	4.28E+07	4.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.80E−01	1.32E+01	6.27E+07	3.8E+06	I	G	1966	ICS		**Sc66**	
1	H	0.0136	1.88E−01	1.38E+01	4.10E+07	7.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.98E−01	1.46E+01	3.98E+07	7.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.00E−01	1.47E+01	5.95E+07	3.6E+06	I	G	1966	ICS		**Sc66**	
1	H	0.0136	2.01E−01	1.48E+01	3.71E+07	3.0E+06	I	G	1962	ICS		**Ro62**	⋆
1	H	0.0136	2.03E−01	1.49E+01	4.47E+07	2.7E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	2.13E−01	1.57E+01	3.79E+07	7.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.16E−01	1.59E+01	3.99E+07	2.4E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	2.28E−01	1.68E+01	3.61E+07	4.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.39E−01	1.76E+01	3.95E+07	2.4E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	2.43E−01	1.79E+01	3.95E+07	2.4E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	2.48E−01	1.83E+01	3.43E+07	3.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.50E−01	1.84E+01	4.70E+07	9.4E+06	SE	G	1992	ICS		Sh92	
1	H	0.0136	2.51E−01	1.85E+01	3.18E+07	2.5E+06	I	G	1962	ICS		**Ro62**	⋆
1	H	0.0136	2.68E−01	1.97E+01	3.31E+07	4.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.88E−01	2.12E+01	3.03E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	3.00E−01	2.21E+01	4.72E+07	2.8E+06	I	G	1966	ICS		**Sc66**	
1	H	0.0136	3.01E−01	2.21E+01	2.63E+07	1.1E+06	I	G	1962	ICS		**Ro62**	⋆
1	H	0.0136	3.18E−01	2.34E+01	2.84E+07	3.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	3.27E−01	2.40E+01	2.80E+07	1.1E+06	I	G	1962	ICS		**Ro62**	⋆
1	H	0.0136	3.48E−01	2.56E+01	2.66E+07	2.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	3.88E−01	2.85E+01	2.50E+07	4.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	4.00E−01	2.94E+01	2.33E+07	9.3E+05	I	G	1962	ICS		**Ro62**	⋆
1	H	0.0136	4.00E−01	2.94E+01	3.92E+07	2.4E+06	I	G	1966	ICS		**Sc66**	
1	H	0.0136	4.02E−01	2.96E+01	2.55E+07	1.5E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	4.28E−01	3.15E+01	2.31E+07	1.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	4.50E−01	3.31E+01	2.08E+07	8.3E+05	I	G	1962	ICS		**Ro62**	⋆
1	H	0.0136	4.68E−01	3.44E+01	2.15E+07	2.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	4.99E−01	3.67E+01	1.98E+07	7.9E+05	I	G	1962	ICS		**Ro62**	⋆
1	H	0.0136	5.00E−01	3.68E+01	3.34E+07	2.0E+06	I	G	1966	ICS		**Sc66**	
1	H	0.0136	5.01E−01	3.69E+01	2.01E+07	1.2E+06	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	5.08E−01	3.74E+01	2.00E+07	5.0E+05	I	G	1987	ICS		Sh87	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
1	H	0.0136	5.48E−01	4.03E+01	1.86E+07	6.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	5.98E−01	4.40E+01	1.77E+07	3.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	6.00E−01	4.41E+01	2.93E+07	1.8E+06	I	G	1966	ICS		**Sc66**	
1	H	0.0136	6.68E−01	4.91E+01	1.59E+07	4.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	7.00E−01	5.15E+01	2.60E+07	1.6E+06	I	G	1965	ICS		**Sc65**	
1	H	0.0136	7.18E−01	5.28E+01	1.26E+07	5.0E+05	I	G	1962	ICS		**Ro62**	⋆
1	H	0.0136	7.48E−01	5.50E+01	1.47E+07	4.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	7.52E−01	5.53E+01	1.31E+07	7.9E+05	I	G	1958	ICS		**Fi58**	⋆
1	H	0.0136	8.00E−01	5.88E+01	2.34E+07	1.4E+06	I	G	1965	ICS		**Sc65**	
1	H	0.0136	8.18E−01	6.02E+01	1.38E+07	2.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	8.98E−01	6.60E+01	1.26E+07	5.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	9.00E−01	6.62E+01	2.12E+07	1.3E+06	I	G	1965	ICS		**Sc65**	
1	H	0.0136	9.98E−01	7.34E+01	1.13E+07	1.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.00E+00	7.35E+01	1.96E+07	1.2E+06	I	G	1965	ICS		**Sc65**	
1	H	0.0136	1.10E+00	8.09E+01	1.05E+07	1.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.20E+00	8.82E+01	9.82E+06	1.9E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.20E+00	8.82E+01	1.68E+07	1.0E+06	I	G	1965	ICS		**Sc65**	
1	H	0.0136	1.30E+00	9.56E+01	9.14E+06	1.5E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.40E+00	1.03E+02	1.49E+07	8.9E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	1.51E+00	1.11E+02	8.07E+06	1.7E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.60E+00	1.18E+02	1.32E+07	7.9E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	1.66E+00	1.22E+02	7.21E+06	2.3E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	1.80E+00	1.32E+02	1.20E+07	7.2E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	1.85E+00	1.36E+02	6.73E+06	2.2E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.00E+00	1.47E+02	6.31E+06	2.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.00E+00	1.47E+02	1.09E+07	6.5E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	2.20E+00	1.62E+02	5.77E+06	1.0E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.45E+00	1.80E+02	5.25E+06	1.2E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	2.50E+00	1.84E+02	9.13E+06	5.5E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	2.70E+00	1.98E+02	4.72E+06	1.1E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	3.00E+00	2.20E+02	4.37E+06	2.1E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	3.00E+00	2.21E+02	7.81E+06	4.7E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	3.30E+00	2.43E+02	4.03E+06	1.2E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	3.50E+00	2.57E+02	6.81E+06	4.1E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	3.65E+00	2.68E+02	3.70E+06	6.0E+04	I	G	1987	ICS		Sh87	
1	H	0.0136	4.00E+00	2.94E+02	3.39E+06	1.7E+05	I	G	1987	ICS		Sh87	
1	H	0.0136	4.00E+00	2.94E+02	6.10E+06	3.7E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	4.50E+00	3.31E+02	5.51E+06	3.3E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	5.00E+00	3.68E+02	5.04E+06	3.0E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	5.50E+00	4.04E+02	4.65E+06	2.8E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	6.00E+00	4.41E+02	4.34E+06	2.6E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	7.00E+00	5.15E+02	3.81E+06	2.3E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	8.00E+00	5.88E+02	3.39E+06	2.0E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	9.00E+00	6.62E+02	3.07E+06	1.8E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	1.00E+01	7.35E+02	2.80E+06	1.7E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	1.20E+01	8.82E+02	2.39E+06	1.4E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	1.40E+01	1.03E+03	2.11E+06	1.3E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	1.60E+01	1.18E+03	1.88E+06	1.1E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	1.80E+01	1.32E+03	1.71E+06	1.0E+05	I	G	1965	ICS		**Sc65**	
1	H	0.0136	2.00E+01	1.47E+03	1.58E+06	9.5E+04	I	G	1965	ICS		**Sc65**	
2	He	0.0246	2.40E−02	–	1.62E+05	9.7E+04	I	G	1956	ICS		**Ha56**	†,#
2	He	0.0246	2.49E−02	1.01E+00	9.57E+05	5.7E+04	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.50E−02	1.02E+00	5.19E+05	3.1E+04	I	G	1965	ICS		Ra65	#
2	He	0.0246	2.50E−02	1.02E+00	6.22E+05	3.7E+04	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	2.50E−02	1.02E+00	7.00E+05	4.2E+04	I	G	1980	ICS		St80	#
2	He	0.0246	2.50E−02	1.02E+00	6.00E+05	4.2E+04	I	G	1963	ICS		**As63**	
2	He	0.0246	2.50E−02	1.02E+00	5.40E+05	3.8E+04	I	G	1963	ICS		**As63**	
2	He	0.0246	2.50E−02	1.02E+00	6.20E+05	3.7E+04	I	G	1962	ICS		**Do62**	#
2	He	0.0246	2.50E−02	1.02E+00	3.70E+05	4.0E+04	I	G	2002	ICS		Re02	
2	He	0.0246	2.55E−02	1.04E+00	1.13E+06	6.8E+04	I	G	1965	ICS		Ra65	#
2	He	0.0246	2.55E−02	1.04E+00	1.27E+06	7.6E+04	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	2.57E−02	1.05E+00	1.53E+06	9.2E+04	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.60E−02	1.06E+00	1.75E+06	1.1E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	2.60E−02	1.06E+00	1.95E+06	1.2E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	2.60E−02	1.06E+00	1.90E+06	1.3E+05	I	G	1963	ICS		**As63**	
2	He	0.0246	2.60E−02	1.06E+00	1.70E+06	1.2E+05	I	G	1963	ICS		**As63**	
2	He	0.0246	2.60E−02	1.06E+00	1.99E+06	1.2E+05	I	G	1962	ICS		**Do62**	#
2	He	0.0246	2.64E−02	1.07E+00	2.53E+06	1.5E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.65E−02	1.08E+00	2.36E+06	1.4E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	2.65E−02	1.08E+00	2.60E+06	1.6E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	2.66E−02	1.08E+00	2.42E+06	8.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	2.68E−02	1.09E+00	2.67E+06	1.6E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.69E−02	1.09E+00	2.24E+06	1.3E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.70E−02	1.10E+00	3.03E+06	1.8E+05	I	G	1965	ICS		Ra65	#

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
2	He	0.0246	2.70E−02	1.10E+00	3.22E+06	1.9E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	2.70E−02	1.10E+00	3.20E+06	2.2E+05	I	G	1963	ICS		**As63**	
2	He	0.0246	2.70E−02	1.10E+00	2.95E+06	2.1E+05	I	G	1963	ICS		**As63**	
2	He	0.0246	2.70E−02	1.10E+00	3.36E+06	2.0E+05	I	G	1962	ICS		**Do62**	#
2	He	0.0246	2.73E−02	1.11E+00	3.00E+06	4.0E+06	I	G	1978	ICS		**Br78**	
2	He	0.0246	2.73E−02	1.11E+00	3.45E+06	2.1E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.75E−02	1.12E+00	3.63E+06	2.2E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	2.75E−02	1.12E+00	3.90E+06	2.3E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	2.75E−02	1.12E+00	2.90E+06	2.0E+05	I	G	2002	ICS		Re02	
2	He	0.0246	2.76E−02	1.12E+00	3.66E+06	9.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	2.80E−02	1.14E+00	4.31E+06	2.6E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.80E−02	1.14E+00	4.25E+06	2.5E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	2.80E−02	1.14E+00	4.55E+06	2.7E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	2.80E−02	1.14E+00	4.50E+06	3.2E+05	I	G	1963	ICS		**As63**	
2	He	0.0246	2.80E−02	1.14E+00	4.13E+06	2.9E+05	I	G	1963	ICS		**As63**	
2	He	0.0246	2.80E−02	1.14E+00	4.70E+06	2.8E+05	I	G	1962	ICS		**Do62**	#
2	He	0.0246	2.83E−02	1.15E+00	2.70E+06	8.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	2.85E−02	1.16E+00	4.86E+06	2.9E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	2.85E−02	1.16E+00	5.20E+06	3.1E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	2.86E−02	1.16E+00	4.80E+06	1.3E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	2.88E−02	1.17E+00	5.73E+06	3.4E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.90E−02	1.18E+00	5.52E+06	3.3E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	2.90E−02	1.18E+00	5.85E+06	3.5E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	2.90E−02	1.18E+00	5.36E+06	3.8E+05	I	G	1963	ICS		**As63**	
2	He	0.0246	2.90E−02	1.18E+00	6.10E+06	3.7E+05	I	G	1962	ICS		**Do62**	#
2	He	0.0246	2.93E−02	1.19E+00	3.30E+06	1.1E+06	I	G	1978	ICS		**Br78**	
2	He	0.0246	2.95E−02	1.20E+00	6.14E+06	3.7E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	2.95E−02	1.20E+00	6.48E+06	3.9E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	2.96E−02	1.20E+00	6.04E+06	1.2E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	2.99E−02	1.21E+00	6.02E+06	3.6E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.00E−02	1.22E+00	6.45E+06	3.9E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.00E−02	1.22E+00	6.74E+06	4.0E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	3.00E−02	1.22E+00	7.10E+06	4.3E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	3.00E−02	1.22E+00	6.90E+06	4.1E+05	I	G	1980	ICS		St80	#
2	He	0.0246	3.00E−02	1.22E+00	7.00E+06	4.9E+05	I	G	1963	ICS		**As63**	
2	He	0.0246	3.00E−02	1.22E+00	6.70E+06	4.7E+05	I	G	1963	ICS		**As63**	
2	He	0.0246	3.00E−02	1.22E+00	7.30E+06	4.4E+05	I	G	1962	ICS		**Do62**	#
2	He	0.0246	3.00E−02	1.22E+00	5.68E+06	4.0E+05	I	G	2002	ICS		Re02	
2	He	0.0246	3.03E−02	1.23E+00	6.15E+06	3.7E+05	I	G	1956	ICS		**Ha56**	†,#
2	He	0.0246	3.03E−02	1.23E+00	5.20E+06	6.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	3.05E−02	1.24E+00	7.37E+06	4.4E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	3.06E−02	1.24E+00	7.15E+06	1.6E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	3.10E−02	1.26E+00	8.66E+06	5.2E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.10E−02	1.26E+00	8.02E+06	4.8E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	3.13E−02	1.27E+00	5.30E+06	8.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	3.15E−02	1.28E+00	8.64E+06	5.2E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	3.20E−02	1.30E+00	9.24E+06	5.5E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	3.20E−02	1.30E+00	9.62E+06	5.8E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	3.20E−02	1.30E+00	9.50E+06	6.7E+05	I	G	1963	ICS		**As63**	
2	He	0.0246	3.20E−02	1.30E+00	9.20E+06	6.4E+05	I	G	1963	ICS		**As63**	
2	He	0.0246	3.20E−02	1.30E+00	9.90E+06	5.9E+05	I	G	1962	ICS		**Do62**	#
2	He	0.0246	3.21E−02	1.30E+00	8.44E+06	5.1E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.21E−02	1.30E+00	8.71E+06	2.2E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	3.23E−02	1.31E+00	4.90E+06	2.4E+06	I	G	1978	ICS		**Br78**	
2	He	0.0246	3.25E−02	1.32E+00	9.85E+06	5.9E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	3.25E−02	1.32E+00	8.51E+06	4.3E+05	I	G	2002	ICS		Re02	
2	He	0.0246	3.29E−02	1.34E+00	1.02E+07	6.1E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.30E−02	1.34E+00	1.04E+07	6.2E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	3.33E−02	1.35E+00	8.10E+06	7.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	3.35E−02	1.36E+00	1.09E+07	6.5E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	3.36E−02	1.37E+00	1.05E+07	3.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	3.40E−02	1.38E+00	1.14E+07	6.9E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	3.40E−02	1.38E+00	1.22E+07	7.3E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	3.42E−02	1.39E+00	1.02E+07	6.1E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.43E−02	1.39E+00	8.40E+06	7.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	3.50E−02	1.42E+00	1.20E+07	7.2E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.50E−02	1.42E+00	1.25E+07	7.5E+05	I	G	1980	ICS		St80	#
2	He	0.0246	3.50E−02	1.42E+00	1.29E+07	9.0E+05	I	G	1963	ICS		**As63**	
2	He	0.0246	3.50E−02	1.42E+00	1.35E+07	8.1E+05	I	G	1962	ICS		**Do62**	#
2	He	0.0246	3.50E−02	1.42E+00	1.09E+07	5.5E+05	I	G	2002	ICS		Re02	
2	He	0.0246	3.51E−02	1.43E+00	1.11E+07	6.6E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.51E−02	1.43E+00	1.14E+07	6.8E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.53E−02	1.43E+00	1.18E+07	1.3E+06	I	G	1978	ICS		**Br78**	
2	He	0.0246	3.60E−02	1.46E+00	1.35E+07	8.1E+05	I	G	1965	ICS		Ra65	#

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
2	He	0.0246	3.60E−02	1.46E+00	1.46E+07	8.7E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	3.61E−02	1.47E+00	1.34E+07	8.1E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.63E−02	1.48E+00	9.60E+06	6.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	3.71E−02	1.51E+00	1.45E+07	8.7E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.73E−02	1.52E+00	1.24E+07	7.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	3.73E−02	1.52E+00	1.18E+07	6.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	3.80E−02	1.54E+00	1.55E+07	9.3E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	3.80E−02	1.54E+00	1.65E+07	9.9E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	3.80E−02	1.54E+00	1.64E+07	1.1E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	3.80E−02	1.54E+00	1.58E+07	1.1E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	3.80E−02	1.54E+00	1.70E+07	1.0E+06	I	G	1962	ICS		**Do62**	#
2	He	0.0246	3.82E−02	1.55E+00	1.40E+07	8.4E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.82E−02	1.55E+00	1.43E+07	8.6E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.86E−02	1.57E+00	1.52E+07	3.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	3.90E−02	1.58E+00	1.58E+07	9.5E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.00E−02	1.63E+00	1.72E+07	1.0E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	4.00E−02	1.63E+00	1.79E+07	1.1E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	4.00E−02	1.63E+00	1.75E+07	1.1E+06	I	G	1980	ICS		St80	#
2	He	0.0246	4.00E−02	1.63E+00	1.78E+07	1.2E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	4.00E−02	1.63E+00	1.75E+07	1.2E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	4.00E−02	1.63E+00	1.88E+07	1.1E+06	I	G	1962	ICS		**Do62**	#
2	He	0.0246	4.00E−02	1.63E+00	1.52E+07	7.6E+05	I	G	2002	ICS		Re02	
2	He	0.0246	4.01E−02	1.63E+00	1.69E+07	1.0E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.12E−02	1.67E+00	1.76E+07	1.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.33E−02	1.76E+00	1.83E+07	1.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.34E−02	1.77E+00	1.86E+07	1.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.36E−02	1.77E+00	1.90E+07	3.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	4.43E−02	1.80E+00	1.90E+07	1.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.50E−02	1.83E+00	2.10E+07	1.3E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	4.50E−02	1.83E+00	2.15E+07	1.3E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	4.50E−02	1.83E+00	2.10E+07	1.3E+06	I	G	1980	ICS		St80	#
2	He	0.0246	4.50E−02	1.83E+00	2.14E+07	1.5E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	4.50E−02	1.83E+00	2.19E+07	1.5E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	4.50E−02	1.83E+00	2.29E+07	1.4E+06	I	G	1962	ICS		**Do62**	#
2	He	0.0246	4.50E−02	1.83E+00	1.90E+07	9.5E+05	I	G	2002	ICS		Re02	
2	He	0.0246	4.52E−02	1.84E+00	2.01E+07	1.2E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.64E−02	1.89E+00	2.06E+07	1.2E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.70E−02	1.91E+00	2.16E+07	1.2E+06	I	G	1978	ICS		**Br78**	
2	He	0.0246	4.73E−02	1.92E+00	2.14E+07	1.3E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.76E−02	1.94E+00	2.02E+07	1.2E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.81E−02	1.95E+00	2.26E+07	1.4E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.81E−02	1.95E+00	2.27E+07	1.4E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.84E−02	1.97E+00	2.21E+07	1.3E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.86E−02	1.98E+00	2.26E+07	5.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	5.00E−02	2.03E+00	2.43E+07	1.5E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	5.00E−02	2.03E+00	2.43E+07	1.5E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	5.00E−02	2.03E+00	2.37E+07	1.4E+06	I	G	1980	ICS		St80	#
2	He	0.0246	5.00E−02	2.03E+00	2.40E+07	1.7E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	5.00E−02	2.03E+00	2.51E+07	1.8E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	5.00E−02	2.03E+00	2.69E+07	1.6E+06	I	G	1962	ICS		**Do62**	#
2	He	0.0246	5.00E−02	2.03E+00	2.24E+07	1.1E+06	I	G	2002	ICS		Re02	
2	He	0.0246	5.02E−02	2.04E+00	2.28E+07	1.4E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	5.12E−02	2.08E+00	2.36E+07	1.4E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	5.33E−02	2.17E+00	2.44E+07	1.5E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	5.36E−02	2.18E+00	2.50E+07	4.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	5.50E−02	2.24E+00	2.71E+07	1.6E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	5.50E−02	2.24E+00	2.66E+07	1.6E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	5.50E−02	2.24E+00	2.65E+07	1.6E+06	I	G	1980	ICS		St80	#
2	He	0.0246	5.50E−02	2.24E+00	2.60E+07	1.8E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	5.50E−02	2.24E+00	2.63E+07	1.8E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	5.50E−02	2.24E+00	2.98E+07	1.8E+06	I	G	1962	ICS		**Do62**	#
2	He	0.0246	5.50E−02	2.24E+00	2.47E+07	1.2E+06	I	G	2002	ICS		Re02	
2	He	0.0246	5.63E−02	2.29E+00	2.61E+07	1.6E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	5.86E−02	2.38E+00	2.66E+07	1.6E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	5.86E−02	2.38E+00	2.73E+07	6.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	6.00E−02	2.44E+00	2.90E+07	1.7E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	6.00E−02	2.44E+00	2.90E+07	1.7E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	6.00E−02	2.44E+00	2.86E+07	1.7E+06	I	G	1980	ICS		St80	#
2	He	0.0246	6.00E−02	2.44E+00	2.90E+07	2.0E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	6.00E−02	2.44E+00	3.08E+07	2.2E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	6.00E−02	2.44E+00	3.20E+07	1.9E+06	I	G	1962	ICS		**Do62**	#
2	He	0.0246	6.00E−02	2.44E+00	2.69E+07	1.3E+06	I	G	2002	ICS		Re02	
2	He	0.0246	6.14E−02	2.49E+00	2.80E+07	1.7E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	6.16E−02	2.50E+00	2.77E+07	1.7E+06	I	G	1984	ICS		Mo84	⋆,#

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
2	He	0.0246	6.50E−02	2.64E+00	3.08E+07	1.8E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	6.50E−02	2.64E+00	3.06E+07	1.8E+06	I	G	1980	ICS		St80	#
2	He	0.0246	6.50E−02	2.64E+00	3.26E+07	2.3E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	6.50E−02	2.64E+00	3.32E+07	2.0E+06	I	G	1962	ICS		**Do62**	#
2	He	0.0246	6.64E−02	2.70E+00	2.90E+07	1.7E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	6.70E−02	2.72E+00	3.05E+07	3.3E+06	I	G	1978	ICS		**Br78**	
2	He	0.0246	6.86E−02	2.79E+00	3.05E+07	7.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	6.88E−02	2.80E+00	2.98E+07	1.8E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	7.00E−02	2.85E+00	3.21E+07	1.9E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	7.00E−02	2.85E+00	3.14E+07	1.9E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	7.00E−02	2.85E+00	3.23E+07	1.9E+06	I	G	1980	ICS		St80	#
2	He	0.0246	7.00E−02	2.85E+00	3.10E+07	2.2E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	7.00E−02	2.85E+00	3.44E+07	2.4E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	7.00E−02	2.85E+00	3.40E+07	2.0E+06	I	G	1962	ICS		**Do62**	#
2	He	0.0246	7.00E−02	2.85E+00	2.96E+07	1.5E+06	I	G	2002	ICS		Re02	
2	He	0.0246	7.16E−02	2.91E+00	3.08E+07	1.8E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	7.16E−02	2.91E+00	3.09E+07	1.9E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	7.50E−02	3.05E+00	3.34E+07	2.0E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	7.50E−02	3.05E+00	3.33E+07	2.0E+06	I	G	1980	ICS		St80	#
2	He	0.0246	7.50E−02	3.05E+00	3.58E+07	2.5E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	7.50E−02	3.05E+00	3.46E+07	2.1E+06	I	G	1962	ICS		**Do62**	#
2	He	0.0246	7.86E−02	3.20E+00	3.29E+07	6.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	7.88E−02	3.20E+00	3.25E+07	1.9E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	8.00E−02	3.25E+00	3.44E+07	2.1E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	8.00E−02	3.25E+00	3.33E+07	2.0E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	8.00E−02	3.25E+00	3.44E+07	2.1E+06	I	G	1980	ICS		St80	#
2	He	0.0246	8.00E−02	3.25E+00	3.30E+07	2.3E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	8.00E−02	3.25E+00	3.68E+07	2.6E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	8.00E−02	3.25E+00	3.51E+07	2.1E+06	I	G	1962	ICS		**Do62**	#
2	He	0.0246	8.00E−02	3.25E+00	3.16E+07	1.6E+06	I	G	2002	ICS		Re02	
2	He	0.0246	8.04E−02	3.27E+00	3.29E+07	2.0E+06	I	G	1956	ICS		**Ha56**	†,#
2	He	0.0246	8.17E−02	3.32E+00	3.39E+07	2.0E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	8.17E−02	3.32E+00	3.32E+07	2.0E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	8.50E−02	3.46E+00	3.51E+07	2.1E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	8.50E−02	3.46E+00	3.54E+07	2.1E+06	I	G	1980	ICS		St80	#
2	He	0.0246	8.50E−02	3.46E+00	3.75E+07	2.6E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	8.86E−02	3.60E+00	3.45E+07	6.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	9.00E−02	3.66E+00	3.57E+07	2.1E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	9.00E−02	3.66E+00	3.45E+07	2.1E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	9.00E−02	3.66E+00	3.60E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	9.00E−02	3.66E+00	3.79E+07	2.7E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	9.00E−02	3.66E+00	3.28E+07	1.6E+06	I	G	2002	ICS		Re02	
2	He	0.0246	9.02E−02	3.67E+00	3.53E+07	5.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	9.20E−02	3.74E+00	3.54E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	9.20E−02	3.74E+00	3.47E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	9.50E−02	3.86E+00	3.62E+07	2.2E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	9.50E−02	3.86E+00	3.65E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	9.50E−02	3.86E+00	3.84E+07	2.7E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	9.52E−02	3.87E+00	3.60E+07	5.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	9.70E−02	3.94E+00	3.84E+07	8.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	9.70E−02	3.94E+00	3.70E+07	9.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	9.92E−02	4.03E+00	3.64E+07	2.2E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	9.92E−02	4.03E+00	3.54E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	9.92E−02	4.03E+00	3.46E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.00E−01	4.07E+00	3.66E+07	2.2E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	1.00E−01	4.07E+00	3.52E+07	2.1E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	1.00E−01	4.07E+00	3.26E+07	2.0E+06	I	G	1966	ICS		**Sc66**	
2	He	0.0246	1.00E−01	4.07E+00	3.69E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.00E−01	4.07E+00	3.67E+07	8.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.00E−01	4.07E+00	3.84E+07	2.7E+06	I	G	1963	ICS		**As63**	
2	He	0.0246	1.00E−01	4.07E+00	3.37E+07	1.7E+06	I	G	2002	ICS		Re02	
2	He	0.0246	1.01E−01	4.10E+00	3.57E+07	2.1E+06	I	G	1956	ICS		**Ha56**	†,#
2	He	0.0246	1.02E−01	4.14E+00	3.57E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.02E−01	4.14E+00	3.65E+07	2.2E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.05E−01	4.27E+00	3.69E+07	2.2E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	1.05E−01	4.27E+00	3.54E+07	2.1E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	1.05E−01	4.27E+00	3.73E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.05E−01	4.27E+00	3.74E+07	9.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.09E−01	4.45E+00	3.64E+07	2.2E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.10E−01	4.47E+00	3.70E+07	2.2E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	1.10E−01	4.47E+00	3.55E+07	2.1E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	1.10E−01	4.47E+00	3.74E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.10E−01	4.47E+00	3.70E+07	5.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.10E−01	4.47E+00	3.41E+07	1.7E+06	I	G	2002	ICS		Re02	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
2	He	0.0246	1.12E−01	4.54E+00	3.57E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.15E−01	4.67E+00	3.72E+07	2.2E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	1.15E−01	4.67E+00	3.55E+07	2.1E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	1.15E−01	4.67E+00	3.74E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.15E−01	4.67E+00	3.67E+07	5.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.20E−01	4.86E+00	3.63E+07	2.2E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.20E−01	4.86E+00	3.61E+07	2.2E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.20E−01	4.88E+00	3.73E+07	2.2E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	1.20E−01	4.88E+00	3.54E+07	2.1E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	1.20E−01	4.88E+00	3.25E+07	2.0E+06	I	G	1966	ICS		**Sc66**	
2	He	0.0246	1.20E−01	4.88E+00	3.74E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.20E−01	4.88E+00	3.70E+07	4.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.20E−01	4.88E+00	3.45E+07	1.7E+06	I	G	2002	ICS		Re02	
2	He	0.0246	1.25E−01	5.08E+00	3.74E+07	2.2E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	1.25E−01	5.08E+00	3.73E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.29E−01	5.25E+00	3.63E+07	2.2E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.30E−01	5.28E+00	3.74E+07	2.2E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	1.30E−01	5.28E+00	3.53E+07	2.1E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	1.30E−01	5.28E+00	3.72E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.30E−01	5.28E+00	3.69E+07	5.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.30E−01	5.28E+00	3.47E+07	1.7E+06	I	G	2002	ICS		Re02	
2	He	0.0246	1.33E−01	5.40E+00	3.66E+07	2.2E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.35E−01	5.49E+00	3.73E+07	2.2E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	1.35E−01	5.49E+00	3.72E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.40E−01	5.69E+00	3.72E+07	2.2E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	1.40E−01	5.69E+00	3.51E+07	2.1E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	1.40E−01	5.69E+00	3.21E+07	1.9E+06	I	G	1966	ICS		**Sc66**	
2	He	0.0246	1.40E−01	5.69E+00	3.72E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.40E−01	5.69E+00	3.67E+07	4.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.40E−01	5.69E+00	3.44E+07	1.7E+06	I	G	2002	ICS		Re02	
2	He	0.0246	1.40E−01	5.70E+00	3.58E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.42E−01	5.79E+00	3.65E+07	2.2E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.45E−01	5.89E+00	3.70E+07	2.2E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	1.45E−01	5.89E+00	3.71E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.47E−01	5.98E+00	3.65E+07	9.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	1.50E−01	6.08E+00	3.50E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.50E−01	6.10E+00	3.69E+07	2.2E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	1.50E−01	6.10E+00	3.47E+07	2.1E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	1.50E−01	6.10E+00	3.69E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.50E−01	6.10E+00	3.77E+07	5.3E+06	I	G	1987	ICS		We87a	
2	He	0.0246	1.50E−01	6.10E+00	3.60E+07	4.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.50E−01	6.10E+00	3.38E+07	1.7E+06	I	G	2002	ICS		Re02	
2	He	0.0246	1.53E−01	6.22E+00	3.58E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.55E−01	6.30E+00	3.67E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.60E−01	6.50E+00	3.55E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.60E−01	6.50E+00	3.44E+07	2.1E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	1.60E−01	6.50E+00	3.11E+07	1.9E+06	I	G	1966	ICS		**Sc66**	
2	He	0.0246	1.60E−01	6.50E+00	3.64E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.60E−01	6.50E+00	3.58E+07	4.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.60E−01	6.50E+00	3.35E+07	1.7E+06	I	G	2002	ICS		Re02	
2	He	0.0246	1.62E−01	6.60E+00	3.54E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.62E−01	6.60E+00	3.59E+07	2.2E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.65E−01	6.71E+00	3.62E+07	2.2E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.70E−01	6.91E+00	3.39E+07	2.0E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	1.70E−01	6.91E+00	3.58E+07	2.1E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.70E−01	6.91E+00	3.55E+07	5.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.70E−01	6.92E+00	3.52E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.74E−01	7.05E+00	3.51E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.75E−01	7.11E+00	3.59E+07	2.2E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	1.75E−01	7.11E+00	3.53E+07	2.1E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.80E−01	7.32E+00	3.00E+07	1.8E+06	I	G	1966	ICS		**Sc66**	
2	He	0.0246	1.80E−01	7.32E+00	3.49E+07	2.1E+06	I	G	1980	ICS		St80	#
2	He	0.0246	1.80E−01	7.32E+00	3.24E+07	1.6E+06	I	G	2002	ICS		Re02	
2	He	0.0246	1.81E−01	7.34E+00	3.42E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.92E−01	7.78E+00	3.42E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.94E−01	7.89E+00	3.39E+07	2.0E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.94E−01	7.89E+00	3.47E+07	2.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	1.95E−01	7.93E+00	3.42E+07	5.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.97E−01	8.01E+00	3.38E+07	1.0E+06	I	G	1978	ICS		**Br78**	
2	He	0.0246	2.00E−01	8.13E+00	3.47E+07	2.1E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	2.00E−01	8.13E+00	3.25E+07	1.9E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	2.00E−01	8.13E+00	2.91E+07	1.7E+06	I	G	1966	ICS		**Sc66**	
2	He	0.0246	2.00E−01	8.13E+00	3.14E+07	1.6E+06	I	G	2002	ICS		Re02	
2	He	0.0246	2.01E−01	8.19E+00	3.28E+07	2.0E+06	I	G	1956	ICS		**Ha56**	†,#

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
2	He	0.0246	2.20E−01	8.94E+00	3.25E+07	4.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	2.25E−01	9.15E+00	3.03E+07	1.5E+06	I	G	2002	ICS		Re02	
2	He	0.0246	2.25E−01	9.15E+00	3.23E+07	1.9E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.28E−01	9.27E+00	3.27E+07	2.0E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.47E−01	1.00E+01	3.16E+07	5.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	2.50E−01	1.02E+01	3.05E+07	1.8E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.50E−01	1.02E+01	3.21E+07	1.9E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	2.50E−01	1.02E+01	3.00E+07	1.8E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	2.50E−01	1.02E+01	3.13E+07	4.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	2.50E−01	1.02E+01	2.90E+07	1.5E+06	I	G	2002	ICS		Re02	
2	He	0.0246	2.53E−01	1.03E+01	3.11E+07	1.9E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.72E−01	1.11E+01	3.00E+07	1.8E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.75E−01	1.12E+01	2.98E+07	1.8E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.80E−01	1.14E+01	2.89E+07	3.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	2.97E−01	1.21E+01	2.88E+07	1.3E+06	I	G	1978	ICS		**Br78**	
2	He	0.0246	2.98E−01	1.21E+01	2.90E+07	1.7E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	2.98E−01	1.21E+01	2.83E+07	1.7E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.00E−01	1.22E+01	2.96E+07	1.8E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	3.00E−01	1.22E+01	2.75E+07	1.6E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	3.00E−01	1.22E+01	2.45E+07	1.5E+06	I	G	1966	ICS		**Sc66**	
2	He	0.0246	3.00E−01	1.22E+01	2.69E+07	1.3E+06	I	G	2002	ICS		Re02	
2	He	0.0246	3.03E−01	1.23E+01	2.67E+07	1.6E+06	I	G	1956	ICS		**Ha56**	†,#
2	He	0.0246	3.24E−01	1.32E+01	2.78E+07	1.7E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.25E−01	1.32E+01	2.65E+07	3.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	3.27E−01	1.33E+01	2.72E+07	1.6E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.47E−01	1.41E+01	2.75E+07	4.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	3.49E−01	1.42E+01	2.65E+07	1.6E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.50E−01	1.42E+01	2.75E+07	1.7E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	3.50E−01	1.42E+01	2.55E+07	1.5E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	3.50E−01	1.42E+01	2.46E+07	1.2E+06	I	G	2002	ICS		Re02	
2	He	0.0246	3.54E−01	1.44E+01	2.64E+07	1.6E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	3.75E−01	1.52E+01	2.53E+07	3.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	3.97E−01	1.61E+01	2.47E+07	1.1E+06	I	G	1978	ICS		**Br78**	
2	He	0.0246	4.00E−01	1.63E+01	2.57E+07	1.5E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	4.00E−01	1.63E+01	2.36E+07	1.4E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	4.00E−01	1.63E+01	2.09E+07	1.3E+06	I	G	1966	ICS		**Sc66**	
2	He	0.0246	4.00E−01	1.63E+01	2.32E+07	1.2E+06	I	G	2002	ICS		Re02	
2	He	0.0246	4.02E−01	1.64E+01	2.31E+07	1.4E+06	I	G	1956	ICS		**Ha56**	†,#
2	He	0.0246	4.03E−01	1.64E+01	2.42E+07	1.5E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.30E−01	1.75E+01	2.32E+07	3.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	4.47E−01	1.82E+01	2.47E+07	8.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	4.50E−01	1.83E+01	2.39E+07	1.4E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	4.50E−01	1.83E+01	2.20E+07	1.3E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	4.53E−01	1.84E+01	2.26E+07	1.4E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	4.95E−01	2.01E+01	1.97E+07	1.2E+06	I	G	1956	ICS		**Ha56**	†,#
2	He	0.0246	4.96E−01	2.02E+01	1.49E+07	8.9E+05	I	G	1967	ICS		**Ga67**	‡,#
2	He	0.0246	5.00E−01	2.03E+01	2.24E+07	1.3E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	5.00E−01	2.03E+01	2.06E+07	1.2E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	5.00E−01	2.03E+01	1.82E+07	1.1E+06	I	G	1966	ICS		**Sc66**	
2	He	0.0246	5.00E−01	2.03E+01	2.09E+07	3.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	5.00E−01	2.03E+01	1.65E+07	9.9E+05	I	G	1980	ICS		**Na80**	
2	He	0.0246	5.00E−01	2.03E+01	2.03E+07	1.0E+06	I	G	2002	ICS		Re02	
2	He	0.0246	5.04E−01	2.05E+01	2.12E+07	1.3E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	5.47E−01	2.22E+01	2.15E+07	2.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	5.50E−01	2.24E+01	2.11E+07	1.3E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	5.50E−01	2.24E+01	1.94E+07	1.2E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	5.54E−01	2.25E+01	1.88E+07	1.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	5.56E−01	2.26E+01	1.98E+07	1.2E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	5.66E−01	2.30E+01	1.49E+07	8.9E+05	I	G	1966	ICS		**Ad66**	‡,#
2	He	0.0246	5.70E−01	2.32E+01	1.87E+07	2.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	5.99E−01	2.43E+01	1.32E+07	7.9E+05	I	G	1967	ICS		**Ga67**	‡,#
2	He	0.0246	6.00E−01	2.44E+01	2.00E+07	1.2E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	6.00E−01	2.44E+01	1.82E+07	1.1E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	6.00E−01	2.44E+01	1.59E+07	9.5E+05	I	G	1966	ICS		**Sc66**	
2	He	0.0246	6.00E−01	2.44E+01	1.79E+07	9.0E+05	I	G	2002	ICS		Re02	
2	He	0.0246	6.04E−01	2.45E+01	1.88E+07	1.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	6.05E−01	2.46E+01	1.76E+07	1.1E+06	I	G	1956	ICS		**Ha56**	†,#
2	He	0.0246	6.50E−01	2.64E+01	1.90E+07	1.1E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	6.50E−01	2.64E+01	1.73E+07	1.0E+06	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	6.50E−01	2.64E+01	1.77E+07	2.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	6.55E−01	2.66E+01	1.76E+07	1.1E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	6.86E−01	2.79E+01	1.32E+07	7.9E+05	I	G	1966	ICS		**Ad66**	‡,#
2	He	0.0246	6.97E−01	2.83E+01	1.18E+07	7.1E+05	I	G	1967	ICS		**Ga67**	‡,#
2	He	0.0246	6.97E−01	2.83E+01	1.71E+07	3.0E+05	I	G	1978	ICS		**Br78**	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
2	He	0.0246	6.97E−01	2.84E+01	1.54E+07	9.3E+05	I	G	1956	ICS		**Ha56**	†,#
2	He	0.0246	7.00E−01	2.85E+01	1.80E+07	1.1E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	7.00E−01	2.85E+01	1.65E+07	9.9E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	7.00E−01	2.85E+01	1.44E+07	8.6E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	7.00E−01	2.85E+01	1.44E+07	8.6E+05	I	G	1980	ICS		**Na80**	
2	He	0.0246	7.00E−01	2.85E+01	1.62E+07	8.1E+05	I	G	2002	ICS		Re02	
2	He	0.0246	7.05E−01	2.86E+01	1.68E+07	1.0E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	7.50E−01	3.05E+01	1.71E+07	1.0E+06	I	G	1965	ICS		Ra65	#
2	He	0.0246	7.50E−01	3.05E+01	1.58E+07	9.5E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	7.50E−01	3.05E+01	1.61E+07	2.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	7.58E−01	3.08E+01	1.57E+07	9.4E+05	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	7.58E−01	3.08E+01	1.66E+07	1.0E+06	I	G	1984	ICS		Mo84	⋆,#
2	He	0.0246	7.73E−01	3.14E+01	1.24E+07	7.4E+05	I	G	1966	ICS		**Ad66**	‡,#
2	He	0.0246	7.94E−01	3.23E+01	1.07E+07	6.4E+05	I	G	1967	ICS		**Ga67**	‡,#
2	He	0.0246	8.00E−01	3.25E+01	1.65E+07	9.9E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	8.00E−01	3.25E+01	1.50E+07	9.0E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	8.00E−01	3.25E+01	1.32E+07	7.9E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	8.00E−01	3.25E+01	1.47E+07	7.4E+05	I	G	2002	ICS		Re02	
2	He	0.0246	8.04E−01	3.27E+01	1.44E+07	8.7E+05	I	G	1956	ICS		**Ha56**	†,#
2	He	0.0246	8.47E−01	3.44E+01	1.52E+07	3.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	8.50E−01	3.46E+01	1.57E+07	9.4E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	8.65E−01	3.52E+01	1.13E+07	6.8E+05	I	G	1966	ICS		**Ad66**	‡,#
2	He	0.0246	8.70E−01	3.54E+01	1.44E+07	2.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	8.92E−01	3.63E+01	9.78E+06	5.9E+05	I	G	1967	ICS		**Ga67**	‡,#
2	He	0.0246	9.00E−01	3.66E+01	1.50E+07	9.0E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	9.00E−01	3.66E+01	1.21E+07	7.3E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	9.00E−01	3.66E+01	1.36E+07	6.8E+05	I	G	2002	ICS		Re02	
2	He	0.0246	9.50E−01	3.86E+01	1.45E+07	8.7E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	9.84E−01	4.00E+01	1.08E+07	6.5E+05	I	G	1966	ICS		**Ad66**	‡,#
2	He	0.0246	9.90E−01	4.02E+01	8.98E+06	5.4E+05	I	G	1967	ICS		**Ga67**	‡,#
2	He	0.0246	9.96E−01	4.05E+01	1.18E+07	7.1E+05	I	G	1956	ICS		**Ha56**	†,#
2	He	0.0246	9.97E−01	4.05E+01	1.37E+07	3.0E+05	I	G	1978	ICS		**Br78**	
2	He	0.0246	1.00E+00	4.07E+01	1.41E+07	8.4E+05	I	G	1965	ICS		Ra65	#
2	He	0.0246	1.00E+00	4.07E+01	1.27E+07	7.6E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	1.00E+00	4.07E+01	1.11E+07	6.7E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	1.00E+00	4.07E+01	1.28E+07	2.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	1.00E+00	4.07E+01	1.20E+07	7.2E+05	I	G	1980	ICS		**Na80**	
2	He	0.0246	1.00E+00	4.07E+01	1.24E+07	6.2E+05	I	G	2002	ICS		Re02	
2	He	0.0246	1.10E+00	4.47E+01	8.41E+06	5.0E+05	I	G	1967	ICS		**Ga67**	‡,#
2	He	0.0246	1.15E+00	4.67E+01	1.19E+07	2.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.20E+00	4.88E+01	9.63E+06	5.8E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	1.20E+00	4.88E+01	7.97E+06	4.8E+05	I	G	1967	ICS		**Ga67**	‡,#
2	He	0.0246	1.29E+00	5.26E+01	7.53E+06	4.5E+05	I	G	1967	ICS		**Ga67**	‡,#
2	He	0.0246	1.32E+00	5.37E+01	1.07E+07	2.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.39E+00	5.66E+01	7.12E+06	4.3E+05	I	G	1967	ICS		**Ga67**	‡,#
2	He	0.0246	1.40E+00	5.69E+01	8.40E+06	5.0E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	1.50E+00	6.10E+01	9.28E+06	5.6E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	1.50E+00	6.10E+01	8.21E+06	4.9E+05	I	G	1980	ICS		**Na80**	
2	He	0.0246	1.50E+00	6.10E+01	6.74E+06	4.0E+05	I	G	1967	ICS		**Ga67**	‡,#
2	He	0.0246	1.52E+00	6.18E+01	9.55E+06	1.2E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.60E+00	6.50E+01	7.66E+06	4.6E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	1.64E+00	6.67E+01	6.30E+06	3.8E+05	I	G	1967	ICS		**Ga67**	‡,#
2	He	0.0246	1.75E+00	7.11E+01	8.72E+06	1.0E+05	I	G	1988	ICS		Sh88	
2	He	0.0246	1.79E+00	7.29E+01	5.97E+06	3.6E+05	I	G	1967	ICS		**Ga67**	‡,#
2	He	0.0246	1.80E+00	7.32E+01	6.94E+06	4.2E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	2.00E+00	8.13E+01	5.42E+06	3.3E+05	I	G	1967	ICS		**Ga67**	‡,#
2	He	0.0246	2.00E+00	8.13E+01	7.35E+06	4.4E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	2.00E+00	8.13E+01	6.27E+06	3.8E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	2.00E+00	8.13E+01	6.93E+06	4.2E+05	I	G	1980	ICS		**Na80**	
2	He	0.0246	2.01E+00	8.17E+01	7.96E+06	9.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	2.30E+00	9.35E+01	6.93E+06	8.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	2.50E+00	1.02E+02	6.08E+06	3.6E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	2.50E+00	1.02E+02	5.28E+06	3.2E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	2.50E+00	1.02E+02	5.55E+06	3.3E+05	I	G	1980	ICS		**Na80**	
2	He	0.0246	2.50E+00	1.02E+02	6.08E+06	3.6E+05	I	G	1934	ICS		**Li34**	#
2	He	0.0246	2.65E+00	1.08E+02	6.15E+06	9.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	3.00E+00	1.22E+02	5.18E+06	3.1E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	3.00E+00	1.22E+02	4.50E+06	2.7E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	3.00E+00	1.22E+02	5.51E+06	7.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	3.00E+00	1.22E+02	4.90E+06	2.9E+05	I	G	1980	ICS		**Na80**	
2	He	0.0246	3.00E+00	1.22E+02	5.12E+06	3.1E+05	I	G	1934	ICS		**Li34**	#
2	He	0.0246	3.50E+00	1.42E+02	4.58E+06	2.7E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	3.50E+00	1.42E+02	3.99E+06	2.4E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	3.50E+00	1.42E+02	5.20E+06	1.3E+05	I	G	1988	ICS		Sh88	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
2	He	0.0246	3.50E+00	1.42E+02	4.24E+06	2.5E+05	I	G	1980	ICS		**Na80**	
2	He	0.0246	3.50E+00	1.42E+02	4.52E+06	2.7E+05	I	G	1934	ICS		**Li34**	#
2	He	0.0246	4.00E+00	1.63E+02	4.02E+06	2.4E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	4.00E+00	1.63E+02	3.58E+06	2.1E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	4.00E+00	1.63E+02	4.48E+06	6.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	4.00E+00	1.63E+02	3.85E+06	2.3E+05	I	G	1980	ICS		**Na80**	
2	He	0.0246	4.00E+00	1.63E+02	3.96E+06	2.4E+05	I	G	1934	ICS		**Li34**	#
2	He	0.0246	4.08E+00	1.66E+02	2.96E+06	1.8E+05	I	G	1975	ICS		**Sh75**	‡,#
2	He	0.0246	4.50E+00	1.83E+02	3.59E+06	2.2E+05	I	G	1930	ICS		**Sm30**	#
2	He	0.0246	4.50E+00	1.83E+02	3.23E+06	1.9E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	4.50E+00	1.83E+02	3.46E+06	2.1E+05	I	G	1980	ICS		**Na80**	
2	He	0.0246	4.50E+00	1.83E+02	3.62E+06	2.2E+05	I	G	1934	ICS		**Li34**	#
2	He	0.0246	4.60E+00	1.87E+02	3.98E+06	5.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	5.00E+00	2.03E+02	2.95E+06	1.8E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	5.00E+00	2.03E+02	3.12E+06	1.9E+05	I	G	1980	ICS		**Na80**	
2	He	0.0246	5.00E+00	2.03E+02	3.25E+06	2.0E+05	I	G	1934	ICS		**Li34**	#
2	He	0.0246	5.50E+00	2.24E+02	2.73E+06	1.6E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	5.50E+00	2.24E+02	3.37E+06	4.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	6.00E+00	2.44E+02	2.57E+06	1.5E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	6.00E+00	2.44E+02	2.67E+06	1.6E+05	I	G	1934	ICS		**Li34**	#
2	He	0.0246	6.10E+00	2.48E+02	3.08E+06	3.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	7.00E+00	2.85E+02	2.24E+06	1.3E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	7.00E+00	2.85E+02	2.76E+06	3.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	7.00E+00	2.85E+02	2.28E+06	1.4E+05	I	G	1934	ICS		**Li34**	#
2	He	0.0246	8.00E+00	3.25E+02	2.01E+06	1.2E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	8.00E+00	3.25E+02	2.50E+06	3.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	8.00E+00	3.25E+02	1.98E+06	1.2E+05	I	G	1934	ICS		**Li34**	#
2	He	0.0246	9.00E+00	3.66E+02	1.81E+06	1.1E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	9.00E+00	3.66E+02	2.24E+06	3.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	9.00E+00	3.66E+02	1.76E+06	1.1E+05	I	G	1934	ICS		**Li34**	#
2	He	0.0246	1.00E+01	4.07E+02	1.68E+06	1.0E+05	I	G	1965	ICS		**Sc65**	
2	He	0.0246	1.00E+01	4.07E+02	1.95E+06	5.0E+04	I	G	1988	ICS		Sh88	
2	He	0.0246	1.00E+01	4.07E+02	1.60E+06	9.6E+04	I	G	1934	ICS		**Li34**	#
2	He	0.0246	1.10E+01	4.47E+02	1.47E+06	8.8E+04	I	G	1934	ICS		**Li34**	#
2	He	0.0246	1.20E+01	4.88E+02	1.44E+06	8.6E+04	I	G	1965	ICS		**Sc65**	
2	He	0.0246	1.40E+01	5.69E+02	1.29E+06	7.7E+04	I	G	1965	ICS		**Sc65**	
2	He	0.0246	1.60E+01	6.50E+02	1.14E+06	6.8E+04	I	G	1965	ICS		**Sc65**	
2	He	0.0246	1.80E+01	7.32E+02	1.04E+06	6.2E+04	I	G	1965	ICS		**Sc65**	
2	He	0.0246	2.00E+01	8.13E+02	9.50E+05	5.7E+04	I	G	1965	ICS		**Sc65**	
6	C	0.2838	2.90E−01	1.02E+00	6.91E+04	1.2E+04	X	G	1973	XRP	0.0027	Ta73	
6	C	0.2838	3.00E−01	1.06E+00	9.44E+04	1.7E+04	X	G	1973	XRP	0.0027	Ta73	
6	C	0.2838	3.50E−01	1.23E+00	1.46E+05	2.6E+04	X	G	1973	XRP	0.0027	Ta73	
6	C	0.2838	4.00E−01	1.41E+00	1.94E+05	3.5E+04	X	G	1973	XRP	0.0027	Ta73	
6	C	0.2838	5.00E−01	1.76E+00	2.50E+05	4.5E+04	X	G	1973	XRP	0.0027	Ta73	
6	C	0.2838	6.00E−01	2.11E+00	2.93E+05	5.3E+04	X	G	1973	XRP	0.0027	Ta73	
6	C	0.2838	7.00E−01	2.47E+00	3.03E+05	5.5E+04	X	G	1973	XRP	0.0027	Ta73	
6	C	0.2838	8.00E−01	2.82E+00	3.27E+05	5.9E+04	X	G	1973	XRP	0.0027	Ta73	
6	C	0.2838	9.00E−01	3.17E+00	3.26E+05	5.9E+04	X	G	1973	XRP	0.0027	Ta73	
6	C	0.2838	1.00E+00	3.52E+00	3.28E+05	5.9E+04	X	G	1973	XRP	0.0027	Ta73	
6	C	0.2838	1.09E+00	3.82E+00	3.28E+05	4.9E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	1.18E+00	4.17E+00	3.26E+05	4.9E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	1.25E+00	4.40E+00	3.26E+05	5.9E+04	X	G	1973	XRP	0.00269	Ta73	
6	C	0.2838	1.28E+00	4.52E+00	3.23E+05	4.8E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	1.38E+00	4.88E+00	3.22E+05	4.8E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	1.48E+00	5.22E+00	3.19E+05	4.8E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	1.50E+00	5.29E+00	3.21E+05	5.8E+04	X	G	1973	XRP	0.00269	Ta73	
6	C	0.2838	1.57E+00	5.54E+00	3.17E+05	4.8E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	1.75E+00	6.17E+00	3.05E+05	5.5E+04	X	G	1973	XRP	0.00269	Ta73	
6	C	0.2838	1.78E+00	6.28E+00	3.09E+05	4.6E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	1.83E+00	6.45E+00	3.49E+05	5.6E+04	X	T	1971	ICS	0.0035	Hi71	⋆
6	C	0.2838	1.88E+00	6.64E+00	3.05E+05	4.6E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	1.98E+00	6.99E+00	3.01E+05	4.5E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	2.00E+00	7.05E+00	2.88E+05	5.2E+04	X	G	1973	XRP	0.00269	Ta73	
6	C	0.2838	2.08E+00	7.33E+00	2.98E+05	4.5E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	2.18E+00	7.66E+00	2.94E+05	4.4E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	2.27E+00	8.01E+00	2.88E+05	4.3E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	2.48E+00	8.73E+00	2.80E+05	4.2E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	2.50E+00	8.81E+00	2.80E+05	4.0E+04	X	TS	2012	ICS	0.00168	Li12	
6	C	0.2838	2.68E+00	9.43E+00	2.72E+05	4.1E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	2.88E+00	1.02E+01	2.61E+05	4.3E+04	X	T	1971	ICS	0.0035	Hi71	⋆,§
6	C	0.2838	2.89E+00	1.02E+01	2.63E+05	3.9E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	3.00E+00	1.06E+01	2.42E+05	4.4E+04	X	G	1973	XRP	0.00269	Ta73	
6	C	0.2838	3.00E+00	1.06E+01	2.60E+05	4.0E+04	X	TS	2012	ICS	0.00168	Li12	
6	C	0.2838	3.08E+00	1.08E+01	2.54E+05	3.8E+04	A	G	1967	ICS	0.0009	Gl67	⋆

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
6	C	0.2838	3.28E+00	1.16E+01	2.47E+05	3.7E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	3.48E+00	1.23E+01	2.40E+05	3.6E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	3.79E+00	1.34E+01	2.30E+05	3.4E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	3.99E+00	1.41E+01	2.13E+05	2.9E+04	X	T	1971	ICS	0.0035	Hi71	⋆,§
6	C	0.2838	4.00E+00	1.41E+01	2.11E+05	3.8E+04	X	G	1973	XRP	0.00269	Ta73	
6	C	0.2838	4.00E+00	1.41E+01	2.30E+05	4.0E+04	X	TS	2012	ICS	0.00168	Li12	
6	C	0.2838	4.09E+00	1.44E+01	2.20E+05	3.3E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	4.39E+00	1.55E+01	2.13E+05	3.2E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	4.69E+00	1.65E+01	2.06E+05	3.1E+04	A	G	1967	ICS	0.0009	Gl67	⋆
6	C	0.2838	4.97E+00	1.75E+01	1.73E+05	1.7E+04	X	T	1971	ICS	0.0035	Hi71	⋆
6	C	0.2838	5.00E+00	1.76E+01	1.83E+05	3.3E+04	X	G	1973	XRP	0.00269	Ta73	
6	C	0.2838	5.00E+00	1.76E+01	2.00E+05	2.0E+04	X	TS	2012	ICS	0.00168	Li12	
6	C	0.2838	6.00E+00	2.11E+01	1.65E+05	3.0E+04	X	G	1973	XRP	0.00269	Ta73	
6	C	0.2838	6.00E+00	2.11E+01	1.71E+05	9.0E+03	X	TS	2012	ICS	0.00168	Li12	
6	C	0.2838	6.98E+00	2.46E+01	1.35E+05	1.5E+04	X	T	1971	ICS	0.0035	Hi71	⋆,§
6	C	0.2838	7.00E+00	2.47E+01	1.52E+05	9.0E+03	X	TS	2012	ICS	0.00168	Li12	
6	C	0.2838	8.00E+00	2.82E+01	1.40E+05	1.0E+04	X	TS	2012	ICS	0.00168	Li12	
6	C	0.2838	8.50E+00	3.00E+01	1.33E+05	2.4E+04	X	G	1973	XRP	0.00269	Ta73	
6	C	0.2838	9.00E+00	3.17E+01	1.24E+05	9.0E+03	X	TS	2012	ICS	0.00168	Li12	
6	C	0.2838	9.97E+00	3.51E+01	9.94E+04	1.3E+04	X	T	1971	ICS	0.0035	Hi71	⋆,§
6	C	0.2838	1.00E+01	3.52E+01	1.10E+05	1.0E+04	X	TS	2012	ICS	0.00168	Li12	
6	C	0.2838	1.06E+01	3.74E+01	1.17E+05	2.1E+04	X	G	1973	XRP	0.00269	Ta73	
6	C	0.2838	1.20E+01	4.23E+01	9.70E+04	4.0E+03	X	TS	2012	ICS	0.00168	Li12	
6	C	0.2838	1.26E+01	4.44E+01	1.02E+05	1.8E+04	X	G	1973	XRP	0.00269	Ta73	
6	C	0.2838	1.47E+01	5.18E+01	9.18E+04	1.7E+04	X	G	1973	XRP	0.00269	Ta73	
6	C	0.2838	1.50E+01	5.27E+01	6.88E+04	9.2E+03	X	T	1971	ICS	0.0035	Hi71	⋆,§
6	C	0.2838	1.50E+01	5.29E+01	7.60E+04	5.0E+03	X	TS	2012	ICS	0.00168	Li12	
6	C	0.2838	1.68E+01	5.92E+01	8.55E+04	1.5E+04	X	G	1973	XRP	0.00269	Ta73	
6	C	0.2838	1.99E+01	7.00E+01	5.38E+04	5.6E+03	X	T	1971	ICS	0.0035	Hi71	⋆
6	C	0.2838	2.00E+01	7.05E+01	5.30E+04	4.0E+03	X	TS	2012	ICS	0.00168	Li12	
6	C	0.2838	2.47E+01	8.71E+01	4.57E+04	5.6E+03	X	T	1971	ICS	0.0035	Hi71	⋆,§
6	C	0.2838	2.50E+01	8.81E+01	7.50E+04	1.5E+04	E	T	1972	ICS		Is72	
6	C	0.2838	2.50E+01	8.81E+01	3.90E+04	3.0E+03	X	TS	2012	ICS	0.00168	Li12	
6	C	0.2838	2.98E+01	1.05E+02	3.87E+04	5.6E+03	X	T	1971	ICS	0.0035	Hi71	⋆,§
6	C	0.2838	7.50E+01	2.64E+02	6.00E+03	1.2E+03	E	T	1972	ICS		Co72	#
6	C	0.2838	8.00E+01	2.82E+02	3.70E+04	6.0E+03	E	T	1975	ICS		Eg75	
6	C	0.2838	8.00E+01	2.82E+02	2.90E+04	5.8E+03	E	T	1979	ICS		Ro79	#
7	N	0.4016	4.50E−01	1.12E+00	5.62E+04	1.0E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	5.00E−01	1.25E+00	7.57E+04	1.4E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	5.94E−01	1.48E+00	8.86E+04	5.5E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	6.00E−01	1.49E+00	1.09E+05	2.0E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	6.59E−01	1.64E+00	1.06E+05	6.8E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	7.00E−01	1.74E+00	1.36E+05	2.5E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	8.00E−01	1.99E+00	1.53E+05	2.8E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	8.35E−01	2.08E+00	1.42E+05	9.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	9.00E−01	2.24E+00	1.59E+05	2.9E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	1.00E+00	2.49E+00	1.72E+05	3.1E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	1.03E+00	2.57E+00	1.56E+05	9.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	1.12E+00	2.78E+00	1.66E+05	1.0E+04	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	1.22E+00	3.05E+00	1.72E+05	9.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	1.25E+00	3.11E+00	1.78E+05	3.2E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	1.43E+00	3.57E+00	1.76E+05	9.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	1.50E+00	3.74E+00	1.76E+05	3.2E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	1.51E+00	3.75E+00	1.76E+05	9.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	1.63E+00	4.05E+00	1.77E+05	8.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	1.71E+00	4.26E+00	1.76E+05	9.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	1.75E+00	4.36E+00	1.79E+05	3.2E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	1.81E+00	4.50E+00	1.76E+05	1.0E+04	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	2.00E+00	4.98E+00	1.72E+05	7.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	2.00E+00	4.98E+00	1.69E+05	3.1E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	2.39E+00	5.94E+00	1.66E+05	8.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	2.78E+00	6.92E+00	1.60E+05	8.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	3.00E+00	7.47E+00	1.48E+05	2.7E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	3.16E+00	7.88E+00	1.53E+05	7.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	3.57E+00	8.90E+00	1.47E+05	8.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	3.98E+00	9.92E+00	1.40E+05	7.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	4.00E+00	9.96E+00	1.35E+05	2.4E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	4.74E+00	1.18E+01	1.27E+05	6.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	5.54E+00	1.38E+01	1.20E+05	7.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	6.00E+00	1.49E+01	1.04E+05	1.9E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	6.31E+00	1.57E+01	1.10E+05	5.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	7.19E+00	1.79E+01	1.03E+05	5.1E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	7.91E+00	1.97E+01	9.67E+04	5.0E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	8.50E+00	2.12E+01	8.75E+04	1.6E+04	X	G	1973	XRP	0.00473	Ta73	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
7	N	0.4016	8.67E+00	2.16E+01	9.14E+04	4.1E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	9.48E+00	2.36E+01	8.61E+04	4.4E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	1.03E+01	2.56E+01	8.11E+04	4.1E+03	A	G	1971	ICS	0.0015	Gl71	⋆
7	N	0.4016	1.06E+01	2.64E+01	7.65E+04	1.4E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	1.26E+01	3.14E+01	6.60E+04	1.2E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	1.47E+01	3.66E+01	5.75E+04	1.0E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	1.68E+01	4.18E+01	5.52E+04	1.0E+04	X	G	1973	XRP	0.00473	Ta73	
7	N	0.4016	2.50E+01	6.23E+01	5.30E+04	1.5E+04	E	T	1973	ICS	0.0015	Is72	
8	O	0.5320	9.26E−01	1.74E+00	6.41E+04	4.6E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	1.00E+00	1.88E+00	7.58E+04	1.6E+04	X	G	1973	XRP	0.00645	Ta73	
8	O	0.5320	1.12E+00	2.10E+00	7.63E+04	5.0E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	1.24E+00	2.33E+00	8.90E+04	8.9E+03	A	G	1985	ICS		Pl85	
8	O	0.5320	1.31E+00	2.46E+00	8.49E+04	5.3E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	1.52E+00	2.86E+00	9.01E+04	4.6E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	1.73E+00	3.25E+00	9.26E+04	4.5E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	1.88E+00	3.54E+00	9.39E+04	4.9E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	2.00E+00	3.76E+00	9.41E+04	1.2E+04	X	G	1973	XRP	0.00645	Ta73	
8	O	0.5320	2.08E+00	3.91E+00	9.40E+04	9.4E+03	A	G	1985	ICS		Pl85	
8	O	0.5320	2.10E+00	3.95E+00	9.50E+04	4.3E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	2.30E+00	4.32E+00	9.49E+04	4.3E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	2.50E+00	4.69E+00	9.38E+04	4.5E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	2.50E+00	4.70E+00	9.70E+04	7.0E+03	X	TS	2012	ICS	0.00571	Li12	
8	O	0.5320	2.78E+00	5.23E+00	9.25E+04	4.3E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	2.83E+00	5.32E+00	8.75E+04	4.5E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	2.89E+00	5.44E+00	9.08E+04	4.1E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	3.00E+00	5.64E+00	9.36E+04	1.2E+04	X	G	1973	XRP	0.00645	Ta73	
8	O	0.5320	3.00E+00	5.64E+00	1.04E+05	7.0E+03	X	TS	2012	ICS	0.00571	Li12	
8	O	0.5320	3.07E+00	5.77E+00	9.00E+04	4.5E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	3.11E+00	5.85E+00	9.10E+04	9.1E+03	A	G	1985	ICS		Pl85	
8	O	0.5320	3.68E+00	6.92E+00	8.56E+04	4.1E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	3.94E+00	7.41E+00	8.35E+04	3.9E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	4.00E+00	7.52E+00	8.96E+04	1.2E+04	X	G	1973	XRP	0.00645	Ta73	
8	O	0.5320	4.00E+00	7.52E+00	9.70E+04	2.0E+03	X	TS	2012	ICS	0.00571	Li12	
8	O	0.5320	4.33E+00	8.14E+00	8.05E+04	3.6E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	4.52E+00	8.50E+00	7.91E+04	3.8E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	4.85E+00	9.11E+00	7.61E+04	3.4E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	5.00E+00	9.40E+00	7.81E+04	1.0E+04	X	G	1973	XRP	0.00645	Ta73	
8	O	0.5320	5.00E+00	9.40E+00	8.60E+04	2.0E+03	X	TS	2012	ICS	0.00571	Li12	
8	O	0.5320	5.31E+00	9.98E+00	7.33E+04	3.1E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	5.80E+00	1.09E+01	7.00E+04	3.2E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	6.00E+00	1.13E+01	6.82E+04	8.9E+03	X	G	1973	XRP	0.00645	Ta73	
8	O	0.5320	6.00E+00	1.13E+01	9.00E+04	1.0E+04	X	TS	2012	ICS	0.00571	Li12	
8	O	0.5320	6.70E+00	1.26E+01	6.13E+04	2.9E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	6.81E+00	1.28E+01	6.51E+04	3.3E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	7.00E+00	1.32E+01	7.10E+04	2.0E+03	X	TS	2012	ICS	0.00571	Li12	
8	O	0.5320	8.00E+00	1.50E+01	6.70E+04	5.0E+03	X	TS	2012	ICS	0.00571	Li12	
8	O	0.5320	8.50E+00	1.60E+01	5.60E+04	7.3E+03	X	G	1973	XRP	0.00645	Ta73	
8	O	0.5320	8.78E+00	1.65E+01	5.71E+04	2.8E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	9.00E+00	1.69E+01	6.20E+04	5.0E+03	X	TS	2012	ICS	0.00571	Li12	
8	O	0.5320	9.68E+00	1.82E+01	5.38E+04	2.3E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	1.00E+01	1.88E+01	5.40E+04	3.0E+03	X	TS	2012	ICS	0.00571	Li12	
8	O	0.5320	1.06E+01	1.99E+01	4.68E+04	6.1E+03	X	G	1973	XRP	0.00645	Ta73	
8	O	0.5320	1.07E+01	2.01E+01	5.09E+04	2.4E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	1.17E+01	2.20E+01	4.83E+04	2.5E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	1.20E+01	2.26E+01	5.10E+04	4.0E+03	X	TS	2012	ICS	0.00571	Li12	
8	O	0.5320	1.26E+01	2.37E+01	4.19E+04	5.4E+03	X	G	1973	XRP	0.00645	Ta73	
8	O	0.5320	1.27E+01	2.38E+01	4.55E+04	1.8E+03	A	G	1971	ICS	0.0022	Gl71	⋆
8	O	0.5320	1.50E+01	2.82E+01	3.80E+04	2.0E+03	X	TS	2012	ICS	0.00571	Li12	
8	O	0.5320	1.68E+01	3.16E+01	3.43E+04	4.5E+03	X	G	1973	XRP	0.00645	Ta73	
8	O	0.5320	2.00E+01	3.76E+01	2.80E+04	3.0E+03	X	TS	2012	ICS	0.00571	Li12	
8	O	0.5320	2.50E+01	4.70E+01	4.00E+04	1.5E+04	E	T	1972	ICS	0.0022	Is72	
8	O	0.5320	2.50E+01	4.70E+01	2.50E+04	2.0E+03	X	TS	2012	ICS	0.00571	Li12	
10	Ne	0.8701	8.78E−01	1.01E+00	5.89E+02	1.3E+02	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	8.80E−01	1.01E+00	6.44E+02	6.4E+01	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	8.83E−01	1.02E+00	9.24E+02	9.2E+01	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	8.85E−01	1.02E+00	1.12E+03	1.1E+02	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	8.91E−01	1.02E+00	1.34E+03	1.3E+02	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	9.01E−01	1.04E+00	2.50E+03	2.5E+02	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	9.10E−01	1.05E+00	3.17E+03	3.2E+02	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	9.21E−01	1.06E+00	4.32E+03	4.3E+02	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	9.31E−01	1.07E+00	4.97E+03	5.0E+02	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	9.42E−01	1.08E+00	5.67E+03	5.7E+02	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	9.50E−01	1.09E+00	6.00E+03	1.1E+03	X	G	1973	XRP	0.016	Ta73	
10	Ne	0.8701	9.51E−01	1.09E+00	7.07E+03	7.1E+02	A	G	1981	ICS	0.016	Hi81	⋆

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
10	Ne	0.8701	9.61E−01	1.10E+00	7.96E+03	8.0E+02	A	G	1981	ICS	0.0155	Hi81	⋆
10	Ne	0.8701	9.71E−01	1.12E+00	8.39E+03	8.4E+02	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	9.80E−01	1.13E+00	9.03E+03	9.0E+02	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	9.90E−01	1.14E+00	9.65E+03	9.7E+02	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	1.00E+00	1.15E+00	9.16E+03	1.6E+03	X	G	1973	XRP	0.0155	Ta73	
10	Ne	0.8701	1.00E+00	1.15E+00	1.06E+04	1.1E+03	A	G	1981	ICS	0.0155	Hi81	⋆
10	Ne	0.8701	1.05E+00	1.21E+00	1.32E+04	1.3E+03	A	G	1981	ICS	0.0155	Hi81	⋆
10	Ne	0.8701	1.10E+00	1.27E+00	1.54E+04	1.5E+03	A	G	1981	ICS	0.0155	Hi81	⋆
10	Ne	0.8701	1.20E+00	1.38E+00	1.98E+04	2.0E+03	A	G	1981	ICS	0.0155	Hi81	⋆
10	Ne	0.8701	1.25E+00	1.44E+00	2.07E+04	3.7E+03	X	G	1973	XRP	0.0155	Ta73	
10	Ne	0.8701	1.26E+00	1.45E+00	1.56E+04	2.7E+03	A	G	1985	ICS		Pl85	
10	Ne	0.8701	1.30E+00	1.49E+00	1.98E+04	1.8E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	1.30E+00	1.50E+00	2.35E+04	2.4E+03	A	G	1981	ICS	0.0155	Hi81	⋆
10	Ne	0.8701	1.40E+00	1.61E+00	2.53E+04	2.5E+03	A	G	1981	ICS	0.0155	Hi81	⋆
10	Ne	0.8701	1.50E+00	1.72E+00	2.88E+04	5.2E+03	X	G	1973	XRP	0.0155	Ta73	
10	Ne	0.8701	1.51E+00	1.73E+00	2.70E+04	2.7E+03	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	1.54E+00	1.77E+00	2.95E+04	5.0E+03	A	G	1985	ICS		Pl85	
10	Ne	0.8701	1.73E+00	1.99E+00	2.84E+04	1.8E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	1.75E+00	2.01E+00	3.09E+04	3.1E+03	A	G	1981	ICS	0.0155	Hi81	⋆
10	Ne	0.8701	1.75E+00	2.01E+00	3.35E+04	6.0E+03	X	G	1973	XRP	0.0155	Ta73	
10	Ne	0.8701	2.00E+00	2.30E+00	3.74E+04	6.7E+03	X	G	1973	XRP	0.0155	Ta73	
10	Ne	0.8701	2.00E+00	2.30E+00	3.44E+04	1.7E+03	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	2.04E+00	2.35E+00	4.05E+04	6.9E+03	A	G	1985	ICS		Pl85	
10	Ne	0.8701	2.17E+00	2.49E+00	3.27E+04	1.9E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	2.50E+00	2.87E+00	3.68E+04	6.6E+03	X	G	1973	XRP	0.0155	Ta73	
10	Ne	0.8701	2.51E+00	2.88E+00	3.85E+04	1.9E+03	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	2.60E+00	2.99E+00	3.55E+04	1.9E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	3.00E+00	3.45E+00	3.82E+04	6.9E+03	X	G	1973	XRP	0.016	Ta73	
10	Ne	0.8701	3.01E+00	3.46E+00	3.95E+04	2.0E+03	A	G	1981	ICS	0.0155	Hi81	⋆
10	Ne	0.8701	3.03E+00	3.49E+00	3.64E+04	1.9E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	3.25E+00	3.74E+00	3.64E+04	1.9E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	3.32E+00	3.82E+00	4.11E+04	7.0E+03	A	G	1985	ICS		Pl85	
10	Ne	0.8701	3.47E+00	3.99E+00	3.64E+04	1.9E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	3.50E+00	4.02E+00	3.94E+04	7.1E+03	X	G	1973	XRP	0.016	Ta73	
10	Ne	0.8701	3.52E+00	4.04E+00	3.97E+04	2.0E+03	A	G	1981	ICS	0.0155	Hi81	⋆
10	Ne	0.8701	3.68E+00	4.22E+00	3.63E+04	1.8E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	3.90E+00	4.48E+00	3.61E+04	1.9E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	4.00E+00	4.60E+00	4.01E+04	7.2E+03	X	G	1973	XRP	0.016	Ta73	
10	Ne	0.8701	4.03E+00	4.63E+00	3.93E+04	2.0E+03	A	G	1981	ICS	0.0155	Hi81	⋆
10	Ne	0.8701	4.08E+00	4.69E+00	3.54E+04	6.0E+03	A	G	1985	ICS		Pl85	
10	Ne	0.8701	4.12E+00	4.73E+00	3.58E+04	1.9E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	4.34E+00	4.98E+00	3.55E+04	1.9E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	4.54E+00	5.22E+00	3.88E+04	1.9E+03	A	G	1981	ICS	0.016	Hi81	⋆
10	Ne	0.8701	5.04E+00	5.79E+00	3.25E+04	5.5E+03	A	G	1985	ICS		Pl85	
10	Ne	0.8701	5.20E+00	5.98E+00	3.41E+04	1.7E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	6.00E+00	6.90E+00	3.50E+04	6.3E+03	X	G	1973	XRP	0.0155	Ta73	
10	Ne	0.8701	6.07E+00	6.97E+00	3.23E+04	1.6E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	6.94E+00	7.97E+00	3.10E+04	1.5E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	7.80E+00	8.97E+00	2.94E+04	1.5E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	8.50E+00	9.77E+00	3.14E+04	5.6E+03	X	G	1973	XRP	0.0155	Ta73	
10	Ne	0.8701	8.67E+00	9.96E+00	2.79E+04	1.4E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	1.04E+01	1.20E+01	2.53E+04	1.2E+03	A	G	1971	ICS	0.025	Gl71	⋆
10	Ne	0.8701	1.06E+01	1.22E+01	2.68E+04	4.8E+03	X	G	1973	XRP	0.0155	Ta73	
10	Ne	0.8701	1.26E+01	1.45E+01	2.35E+04	4.2E+03	X	G	1973	XRP	0.0155	Ta73	
10	Ne	0.8701	1.47E+01	1.69E+01	2.23E+04	4.0E+03	X	G	1973	XRP	0.0155	Ta73	
11	Na	1.0721	7.00E+04	6.53E+04	3.50E+03	5.6E+02	X	T	1980	ICS	0.024	Ka80	
11	Na	1.0721	2.30E+05	2.15E+05	3.50E+03	5.6E+02	X	T	1980	ICS	0.024	Ka80	
12	Mg	1.3050	1.00E+04	7.66E+03	8.74E+02	1.4E+02	X	T	1988	ICS	0.0272	Mc88	
12	Mg	1.3050	2.00E+04	1.53E+04	1.19E+03	1.9E+02	X	T	1988	ICS	0.0272	Mc88	
12	Mg	1.3050	5.00E+04	3.83E+04	2.03E+03	5.5E+02	X	T	1979	ICS	0.027	Ho79	
12	Mg	1.3050	7.00E+04	5.36E+04	2.64E+03	4.2E+02	X	T	1980	ICS	0.0272	Ka80	
12	Mg	1.3050	2.30E+05	1.76E+05	2.80E+03	4.5E+02	X	T	1980	ICS	0.0272	Ka80	
13	Al	1.5596	2.50E+00	1.60E+00	9.70E+03	4.0E+02	X	TS	2012	ICS	0.0371	Li12	
13	Al	1.5596	2.50E+00	1.60E+00	9.58E+03	1.2E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	2.98E+00	1.91E+00	1.11E+04	1.2E+03	X	T	1969	ICS	0.038	Hi69	⋆
13	Al	1.5596	3.00E+00	1.92E+00	1.07E+04	5.0E+01	X	TS	2012	ICS	0.0371	Li12	
13	Al	1.5596	3.00E+00	1.92E+00	1.18E+04	1.4E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	3.50E+00	2.24E+00	1.32E+04	1.6E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	3.95E+00	2.53E+00	1.36E+04	1.5E+03	X	T	1969	ICS	0.038	Hi69	⋆
13	Al	1.5596	4.00E+00	2.56E+00	1.45E+04	4.0E+02	X	TS	2012	ICS	0.0371	Li12	
13	Al	1.5596	4.00E+00	2.56E+00	1.31E+04	1.6E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	4.00E+00	2.56E+00	1.34E+04	1.6E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	4.50E+00	2.89E+00	1.38E+04	1.6E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	4.50E+00	2.89E+00	1.40E+04	1.7E+03	X	TtS	2016	ICS	0.0371	**Me16**	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
13	Al	1.5596	5.00E+00	3.21E+00	1.46E+04	7.0E+02	X	TS	2012	ICS	0.0371	Li12	
13	Al	1.5596	5.00E+00	3.21E+00	1.46E+04	1.7E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	5.00E+00	3.21E+00	1.39E+04	1.7E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	5.00E+00	3.21E+00	1.52E+04	1.9E+03	X	S	2020	ICS	0.0387	**Li20**	
13	Al	1.5596	5.50E+00	3.53E+00	1.48E+04	1.8E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	5.50E+00	3.53E+00	1.38E+04	1.7E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	5.54E+00	3.55E+00	1.44E+04	1.6E+03	X	T	1969	ICS	0.038	Hi69	⋆
13	Al	1.5596	6.00E+00	3.85E+00	1.51E+04	1.8E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	6.00E+00	3.85E+00	1.35E+04	1.6E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	7.00E+00	4.49E+00	1.41E+04	5.0E+02	X	TS	2012	ICS	0.0371	Li12	
13	Al	1.5596	7.00E+00	4.49E+00	1.45E+04	1.7E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	7.00E+00	4.49E+00	1.34E+04	1.6E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	7.00E+00	4.49E+00	1.48E+04	1.7E+03	X	S	2020	ICS	0.0387	**Li20**	
13	Al	1.5596	7.05E+00	4.52E+00	1.37E+04	1.2E+03	X	T	1969	ICS	0.038	Hi69	⋆
13	Al	1.5596	8.00E+00	5.13E+00	1.39E+04	1.7E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	8.00E+00	5.13E+00	1.32E+04	1.6E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	9.00E+00	5.77E+00	1.34E+04	1.6E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	9.03E+00	5.79E+00	1.25E+04	1.1E+03	X	T	1969	ICS	0.038	Hi69	⋆
13	Al	1.5596	1.00E+01	6.41E+00	1.20E+04	6.0E+02	X	TS	2012	ICS	0.0371	Li12	
13	Al	1.5596	1.00E+01	6.41E+00	1.26E+04	1.5E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	1.00E+01	6.41E+00	1.23E+04	1.5E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	1.00E+01	6.41E+00	1.33E+04	1.5E+03	X	S	2020	ICS	0.0387	**Li20**	
13	Al	1.5596	1.10E+01	7.05E+00	1.19E+04	1.1E+03	X	T	1969	ICS	0.038	Hi69	⋆
13	Al	1.5596	1.20E+01	7.69E+00	1.15E+04	1.4E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	1.20E+01	7.69E+00	1.13E+04	1.4E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	1.30E+01	8.34E+00	1.18E+04	1.5E+03	X	S	2020	ICS	0.0387	**Li20**	
13	Al	1.5596	1.40E+01	8.96E+00	1.07E+04	9.6E+02	X	T	1969	ICS	0.038	Hi69	⋆
13	Al	1.5596	1.40E+01	8.98E+00	9.96E+03	1.2E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	1.40E+01	8.98E+00	1.03E+04	1.2E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	1.50E+01	9.62E+00	1.05E+04	6.0E+02	X	TS	2012	ICS	0.0371	Li12	
13	Al	1.5596	1.50E+01	9.62E+00	1.10E+04	1.4E+03	X	S	2020	ICS	0.0387	**Li20**	
13	Al	1.5596	1.60E+01	1.03E+01	9.38E+03	1.1E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	1.60E+01	1.03E+01	9.53E+03	1.2E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	1.70E+01	1.09E+01	1.03E+04	1.2E+03	X	S	2020	ICS	0.0387	**Li20**	
13	Al	1.5596	1.75E+01	1.12E+01	9.44E+03	1.4E+03	X	T	1969	ICS	0.038	Hi69	⋆
13	Al	1.5596	1.80E+01	1.15E+01	9.00E+03	1.1E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	1.80E+01	1.15E+01	9.22E+03	1.1E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	2.00E+01	1.28E+01	9.40E+03	5.0E+02	X	TS	2012	ICS	0.0371	Li12	
13	Al	1.5596	2.00E+01	1.28E+01	8.45E+03	1.0E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	2.00E+01	1.28E+01	8.39E+03	1.1E+03	X	TtS	2016	ICS	0.0371	**Me16**	
13	Al	1.5596	2.00E+01	1.28E+01	9.40E+03	1.1E+03	X	S	2020	ICS	0.0387	**Li20**	
13	Al	1.5596	2.20E+01	1.41E+01	8.86E+03	1.1E+03	X	S	2020	ICS	0.0387	**Li20**	
13	Al	1.5596	2.20E+01	1.41E+01	8.34E+03	5.8E+02	X	T	1969	ICS	0.038	Hi69	⋆
13	Al	1.5596	2.50E+01	1.60E+01	8.21E+03	1.0E+03	X	S	2020	ICS	0.0387	**Li20**	
13	Al	1.5596	2.62E+01	1.68E+01	7.50E+03	5.3E+02	X	T	1969	ICS	0.038	Hi69	⋆
13	Al	1.5596	2.70E+01	1.73E+01	7.85E+03	1.0E+03	X	S	2020	ICS	0.0387	**Li20**	
13	Al	1.5596	3.00E+01	1.92E+01	6.72E+03	4.7E+02	X	T	1969	ICS	0.038	Hi69	⋆
13	Al	1.5596	1.00E+02	6.41E+01	1.51E+03	2.3E+02	X	T	1987	ICS	0.0381	**We87b**	⋆
13	Al	1.5596	1.00E+04	6.41E+03	8.85E+02	1.4E+02	X	T	1988	ICS	0.0357	Mc88	
13	Al	1.5596	2.00E+04	1.28E+04	1.26E+03	2.0E+02	X	T	1988	ICS	0.0357	Mc88	
13	Al	1.5596	5.00E+04	3.21E+04	2.18E+03	3.0E+02	X	T	1979	ICS	0.036	Ho79	
13	Al	1.5596	7.00E+04	4.49E+04	2.38E+03	3.8E+02	X	T	1980	ICS	0.0357	Ka80	
13	Al	1.5596	1.50E+05	9.62E+04	2.84E+03	1.1E+03	X	T	1977	ICS	0.038	Is77	⋆
13	Al	1.5596	2.30E+05	1.47E+05	2.55E+03	4.1E+02	X	T	1980	ICS	0.0357	Ka80	
14	Si	1.8389	2.10E+00	1.14E+00	7.42E+02	1.1E+02	X	S	2015	XRP	0.0485	**Pe15**	⋈
14	Si	1.8389	2.20E+00	1.20E+00	1.20E+03	1.7E+02	X	S	2015	XRP	0.0485	**Pe15**	⋈
14	Si	1.8389	2.30E+00	1.25E+00	1.71E+03	2.5E+02	X	S	2015	XRP	0.0485	**Pe15**	⋈
14	Si	1.8389	2.40E+00	1.31E+00	2.27E+03	3.1E+02	X	S	2015	XRP	0.0485	**Pe15**	⋈
14	Si	1.8389	2.50E+00	1.36E+00	4.80E+03	3.0E+02	X	TS	2012	ICS	0.0485	Li12	
14	Si	1.8389	2.60E+00	1.41E+00	3.51E+03	5.4E+02	X	S	2015	XRP	0.0485	**Pe15**	⋈
14	Si	1.8389	2.80E+00	1.52E+00	4.54E+03	6.1E+02	X	S	2015	XRP	0.0485	**Pe15**	⋈
14	Si	1.8389	3.00E+00	1.63E+00	6.59E+03	5.0E+01	X	TS	2012	ICS	0.0485	Li12	
14	Si	1.8389	3.00E+00	1.63E+00	5.57E+03	8.3E+02	X	S	2015	XRP	0.0485	**Pe15**	⋈
14	Si	1.8389	3.35E+00	1.82E+00	7.61E+03	1.0E+03	X	T	2009	ICS	0.043	Zh09	
14	Si	1.8389	3.50E+00	1.90E+00	7.42E+03	1.1E+03	X	S	2015	XRP	0.0485	**Pe15**	⋈
14	Si	1.8389	3.99E+00	2.17E+00	8.80E+03	8.8E+02	A	G	1985	ICS	0.043	Pl85	
14	Si	1.8389	4.00E+00	2.18E+00	8.10E+03	3.0E+02	X	TS	2012	ICS	0.0485	Li12	
14	Si	1.8389	4.00E+00	2.18E+00	8.45E+03	1.2E+03	X	S	2015	XRP	0.0485	**Pe15**	⋈
14	Si	1.8389	4.85E+00	2.64E+00	8.78E+03	1.2E+03	X	T	2009	ICS	0.043	Zh09	
14	Si	1.8389	5.00E+00	2.72E+00	9.50E+03	1.0E+03	X	TS	2012	ICS	0.0485	Li12	
14	Si	1.8389	5.00E+00	2.72E+00	9.69E+03	1.4E+03	X	S	2015	XRP	0.0485	**Pe15**	⋈
14	Si	1.8389	5.13E+00	2.79E+00	8.50E+03	8.5E+02	A	G	1985	ICS	0.043	Pl85	
14	Si	1.8389	5.69E+00	3.09E+00	8.60E+03	8.6E+02	A	G	1985	ICS	0.043	Pl85	
14	Si	1.8389	6.00E+00	3.26E+00	9.90E+03	1.3E+03	X	S	2015	XRP	0.0485	**Pe15**	⋈

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
14	Si	1.8389	6.36E+00	3.46E+00	9.04E+03	1.2E+03	X	T	2009	ICS	0.043	Zh09	
14	Si	1.8389	6.62E+00	3.60E+00	9.50E+03	9.5E+02	A	G	1985	ICS	0.043	Pl85	
14	Si	1.8389	7.00E+00	3.81E+00	9.90E+03	7.0E+02	X	TS	2012	ICS	0.0485	Li12	
14	Si	1.8389	7.87E+00	4.28E+00	8.86E+03	1.2E+03	X	T	2009	ICS	0.043	Zh09	
14	Si	1.8389	7.95E+00	4.32E+00	9.60E+03	9.6E+02	A	G	1985	ICS	0.043	Pl85	
14	Si	1.8389	8.00E+00	4.35E+00	9.69E+03	1.1E+03	X	S	2015	XRP	0.0485	**Pe15**	⋈
14	Si	1.8389	9.37E+00	5.10E+00	9.01E+03	1.2E+03	X	T	2009	ICS	0.0430	Zh09	
14	Si	1.8389	1.00E+01	5.44E+00	9.00E+03	1.0E+03	X	TS	2012	ICS	0.0485	Li12	
14	Si	1.8389	1.09E+01	5.92E+00	8.92E+03	1.2E+03	X	T	2009	ICS	0.043	Zh09	
14	Si	1.8389	1.24E+01	6.74E+00	8.47E+03	1.2E+03	X	T	2009	ICS	0.043	Zh09	
14	Si	1.8389	1.39E+01	7.55E+00	8.07E+03	1.1E+03	X	T	2009	ICS	0.043	Zh09	
14	Si	1.8389	1.50E+01	8.16E+00	8.20E+03	5.0E+02	X	TS	2012	ICS	0.0485	Li12	
14	Si	1.8389	1.50E+01	8.16E+00	8.45E+03	1.0E+03	X	S	2015	XRP	0.0485	**Pe15**	⋈
14	Si	1.8389	1.54E+01	8.37E+00	7.85E+03	1.1E+03	X	T	2009	ICS	0.043	Zh09	
14	Si	1.8389	1.69E+01	9.20E+00	7.49E+03	1.0E+03	X	T	2009	ICS	0.043	Zh09	
14	Si	1.8389	1.84E+01	1.00E+01	7.14E+03	9.8E+02	X	T	2009	ICS	0.043	Zh09	
14	Si	1.8389	1.99E+01	1.08E+01	7.07E+03	9.8E+02	X	T	2009	ICS	0.043	Zh09	
14	Si	1.8389	2.00E+01	1.09E+01	6.90E+03	6.0E+02	X	TS	2012	ICS	0.0485	Li12	
14	Si	1.8389	2.00E+01	1.09E+01	8.25E+03	9.2E+02	X	S	2015	XRP	0.0485	**Pe15**	⋈
14	Si	1.8389	2.14E+01	1.17E+01	7.25E+03	1.0E+03	X	T	2009	ICS	0.043	Zh09	
14	Si	1.8389	2.29E+01	1.25E+01	7.02E+03	9.7E+02	X	T	2009	ICS	0.043	Zh09	
14	Si	1.8389	2.44E+01	1.33E+01	6.88E+03	9.6E+02	X	T	2009	ICS	0.043	Zh09	
14	Si	1.8389	1.57E+04	8.54E+03	1.48E+03	3.4E+02	X	T	1994	ICS-XRP	0.047	Sh94	
14	Si	1.8389	2.57E+04	1.40E+04	1.67E+03	3.8E+02	X	T	1994	ICS-XRP	0.047	Sh94	
14	Si	1.8389	5.00E+04	2.72E+04	1.59E+03	2.3E+02	X	T	1979	ICS	0.047	Ho79	
14	Si	1.8389	1.50E+05	8.16E+04	2.25E+03	9.0E+02	X	T	1977	ICS	0.043	Is77	
16	S	2.4720	7.00E+00	2.83E+00	3.51E+03	4.6E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	8.00E+00	3.24E+00	3.67E+03	4.8E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	9.00E+00	3.64E+00	3.94E+03	5.1E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	1.00E+01	4.05E+00	4.06E+03	5.3E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	1.10E+01	4.45E+00	4.04E+03	5.2E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	1.20E+01	4.85E+00	4.04E+03	5.2E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	1.30E+01	5.26E+00	4.01E+03	5.2E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	1.40E+01	5.66E+00	3.86E+03	5.0E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	1.50E+01	6.07E+00	3.71E+03	4.8E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	1.60E+01	6.47E+00	3.64E+03	4.7E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	1.70E+01	6.88E+00	3.55E+03	4.6E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	1.80E+01	7.28E+00	3.53E+03	4.6E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	1.90E+01	7.69E+00	3.39E+03	4.4E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	2.00E+01	8.09E+00	3.38E+03	4.4E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	2.10E+01	8.50E+00	3.35E+03	4.4E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	2.20E+01	8.90E+00	3.28E+03	4.3E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	2.30E+01	9.30E+00	3.21E+03	4.2E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	2.40E+01	9.71E+00	3.07E+03	4.0E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	2.50E+01	1.01E+01	3.00E+03	3.9E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	2.60E+01	1.05E+01	2.95E+03	3.8E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	2.70E+01	1.09E+01	2.85E+03	3.7E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	2.80E+01	1.13E+01	2.83E+03	3.7E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	2.90E+01	1.17E+01	2.69E+03	3.5E+02	X	TS	2010	ICS	0.0788	Wu10	
16	S	2.4720	3.00E+01	1.21E+01	2.68E+03	3.5E+02	X	TS	2010	ICS	0.0788	Wu10	
17	Cl	2.8224	6.00E+00	2.13E+00	1.86E+03	3.0E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	7.00E+00	2.48E+00	2.26E+03	3.6E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	8.00E+00	2.83E+00	2.76E+03	4.4E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	1.00E+01	3.54E+00	3.03E+03	4.8E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	1.20E+01	4.25E+00	3.17E+03	5.1E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	1.40E+01	4.96E+00	3.04E+03	4.9E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	1.60E+01	5.67E+00	2.95E+03	4.7E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	1.80E+01	6.38E+00	2.80E+03	4.5E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	1.90E+01	6.73E+00	2.76E+03	4.4E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	2.10E+01	7.44E+00	2.65E+03	4.2E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	2.20E+01	7.79E+00	2.63E+03	4.2E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	2.30E+01	8.15E+00	2.59E+03	4.1E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	2.40E+01	8.50E+00	2.49E+03	4.0E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	2.70E+01	9.57E+00	2.34E+03	3.7E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	2.80E+01	9.92E+00	2.34E+03	3.8E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	3.00E+01	1.06E+01	2.11E+03	3.4E+02	X	TS	2011	ICS	0.0873	Wu11	
17	Cl	2.8224	7.00E+04	2.48E+04	1.22E+03	1.9E+02	X	T	1980	ICS	0.0942	Ka80	
17	Cl	2.8224	2.30E+05	8.15E+04	1.30E+03	2.1E+02	X	T	1980	ICS	0.0942	Ka80	
17	Cl	2.8224	2.70E+05	9.57E+04	1.27E+03	5.1E+02	X	T	1977	ICS	0.0955	Is77	
18	Ar	3.2060	3.21E+00	1.00E+00	5.98E+00	1.5E+00	X	G	1983	ICS		Hi83	★, ♡
18	Ar	3.2060	3.21E+00	1.00E+00	1.86E+01	3.1E+00	X	G	1983	ICS		Hi83	★
18	Ar	3.2060	3.22E+00	1.00E+00	3.14E+01	4.3E+00	X	G	1983	ICS		Hi83	★
18	Ar	3.2060	3.22E+00	1.00E+00	4.87E+01	3.6E+00	X	G	1983	ICS		Hi83	★
18	Ar	3.2060	3.23E+00	1.01E+00	6.28E+01	3.7E+00	X	G	1983	ICS		Hi83	★

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
18	Ar	3.2060	3.24E+00	1.01E+00	9.48E+01	7.0E+00	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.24E+00	1.01E+00	1.26E+02	9.2E+00	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.25E+00	1.02E+00	1.58E+02	6.9E+00	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.27E+00	1.02E+00	1.79E+02	7.8E+00	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.27E+00	1.02E+00	2.07E+02	1.2E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.28E+00	1.02E+00	2.28E+02	1.3E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.30E+00	1.03E+00	2.67E+02	1.6E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.32E+00	1.03E+00	3.16E+02	1.8E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.33E+00	1.04E+00	3.34E+02	2.0E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.35E+00	1.04E+00	3.64E+02	2.1E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.36E+00	1.05E+00	3.02E+02	6.6E+01	X	G	1982	ICS	0.118	Hi82	⋆
18	Ar	3.2060	3.37E+00	1.05E+00	4.20E+02	2.4E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.40E+00	1.06E+00	4.90E+02	2.1E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.44E+00	1.07E+00	5.49E+02	3.2E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.49E+00	1.09E+00	6.42E+02	4.7E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.50E+00	1.09E+00	4.50E+01	9.0E+00	X	G	2007	ICS-XRP	0.110	**Ay07**	
18	Ar	3.2060	3.55E+00	1.11E+00	7.19E+02	3.1E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.57E+00	1.11E+00	7.57E+02	1.1E+02	X	G	1982	ICS	0.118	Hi82	⋆
18	Ar	3.2060	3.64E+00	1.14E+00	8.20E+02	1.6E+02	A	G	1985	ICS	0.122	Pl85	
18	Ar	3.2060	3.65E+00	1.14E+00	8.52E+02	5.0E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.72E+00	1.16E+00	9.82E+02	4.3E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.85E+00	1.20E+00	1.07E+03	1.6E+02	X	G	1982	ICS	0.118	Hi82	⋆
18	Ar	3.2060	3.97E+00	1.24E+00	1.18E+03	6.9E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	3.99E+00	1.24E+00	1.35E+03	2.7E+02	A	G	1985	ICS	0.122	Pl85	
18	Ar	3.2060	4.00E+00	1.25E+00	1.29E+03	2.8E+02	X	G	1973	XRP	0.122	Ta73	
18	Ar	3.2060	4.00E+00	1.25E+00	5.91E+02	1.2E+02	X	G	2007	ICS-XRP	0.11	**Ay07**	
18	Ar	3.2060	4.00E+00	1.25E+00	7.00E+02		X	G	1970	ICS		**Do70**	◇
18	Ar	3.2060	4.05E+00	1.26E+00	1.25E+03	1.8E+02	X	G	1982	ICS	0.118	Hi82	⋆
18	Ar	3.2060	4.26E+00	1.33E+00	1.35E+03	2.4E+02	X	G	1982	ICS	0.121	Qu82	⋆
18	Ar	3.2060	4.28E+00	1.33E+00	1.32E+03	5.7E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	4.32E+00	1.35E+00	1.47E+03	2.1E+02	X	G	1982	ICS	0.118	Hi82	⋆
18	Ar	3.2060	4.54E+00	1.42E+00	1.66E+03	3.3E+02	A	G	1985	ICS	0.122	Pl85	
18	Ar	3.2060	4.57E+00	1.43E+00	1.44E+03	8.4E+01	X	G	1983	ICS		Hi83	⋆
18	Ar	3.2060	5.00E+00	1.56E+00	1.79E+03	3.9E+02	X	G	1973	XRP	0.122	Ta73	
18	Ar	3.2060	5.00E+00	1.56E+00	1.41E+03	2.8E+02	X	G	2007	ICS-XRP	0.11	**Ay07**	
18	Ar	3.2060	5.00E+00	1.56E+00	1.60E+03		X	G	1970	ICS		**Do70**	◇
18	Ar	3.2060	5.05E+00	1.58E+00	2.26E+03	4.5E+02	A	G	1985	ICS	0.122	Pl85	
18	Ar	3.2060	5.29E+00	1.65E+00	1.71E+03	2.7E+02	X	G	1982	ICS	0.121	Qu82	⋆
18	Ar	3.2060	5.49E+00	1.71E+00	2.14E+03	2.6E+02	X	G	1982	ICS	0.118	Hi82	⋆
18	Ar	3.2060	5.97E+00	1.86E+00	2.76E+03	5.5E+02	A	G	1985	ICS	0.122	Pl85	
18	Ar	3.2060	6.00E+00	1.87E+00	2.25E+03	4.8E+02	X	G	1973	XRP	0.122	Ta73	
18	Ar	3.2060	6.00E+00	1.87E+00	2.40E+03	4.8E+02	X	G	2007	ICS-XRP	0.110	**Ay07**	
18	Ar	3.2060	6.00E+00	1.87E+00	2.40E+03		X	G	1970	ICS		**Do70**	◇
18	Ar	3.2060	6.03E+00	1.88E+00	2.19E+03	2.8E+02	X	G	1982	ICS	0.121	Qu82	⋆
18	Ar	3.2060	6.45E+00	2.01E+00	2.62E+03	3.9E+02	X	G	1982	ICS	0.118	Hi82	⋆
18	Ar	3.2060	6.99E+00	2.18E+00	2.76E+03	5.5E+02	A	G	1985	ICS	0.122	Pl85	
18	Ar	3.2060	7.00E+00	2.18E+00	2.89E+03	5.8E+02	X	G	2007	ICS-XRP	0.11	**Ay07**	
18	Ar	3.2060	7.00E+00	2.18E+00	3.10E+03		X	G	1970	ICS		**Do70**	◇
18	Ar	3.2060	7.37E+00	2.30E+00	2.66E+03	4.2E+02	X	G	1982	ICS	0.118	Hi82	⋆
18	Ar	3.2060	7.66E+00	2.39E+00	2.59E+03	4.2E+02	X	G	1982	ICS	0.121	Qu82	⋆
18	Ar	3.2060	8.00E+00	2.50E+00	3.37E+03	6.7E+02	A	G	1985	ICS	0.122	Pl85	
18	Ar	3.2060	8.00E+00	2.50E+00	3.16E+03	6.3E+02	X	G	2007	ICS-XRP	0.11	**Ay07**	
18	Ar	3.2060	8.00E+00	2.50E+00	3.70E+03		X	G	1970	ICS		**Do70**	◇
18	Ar	3.2060	8.11E+00	2.53E+00	2.98E+03	4.3E+02	X	G	1982	ICS	0.121	Qu82	⋆
18	Ar	3.2060	8.25E+00	2.57E+00	2.86E+03	4.1E+02	X	G	1982	ICS	0.118	Hi82	⋆
18	Ar	3.2060	8.50E+00	2.65E+00	2.75E+03	5.9E+02	X	G	1973	XRP	0.122	Ta73	
18	Ar	3.2060	8.90E+00	2.78E+00	3.46E+03	6.9E+02	A	G	1985	ICS	0.122	Pl85	
18	Ar	3.2060	9.00E+00	2.81E+00	3.15E+03	6.3E+02	X	G	2007	ICS-XRP	0.11	**Ay07**	
18	Ar	3.2060	9.00E+00	2.81E+00	4.20E+03		X	G	1970	ICS		**Do70**	◇
18	Ar	3.2060	9.15E+00	2.85E+00	2.90E+03	4.6E+02	X	G	1982	ICS	0.118	Hi82	⋆
18	Ar	3.2060	9.74E+00	3.04E+00	2.96E+03	5.9E+02	A	G	1985	ICS	0.122	Pl85	
18	Ar	3.2060	9.88E+00	3.08E+00	2.78E+03	3.6E+02	X	G	2003	ICS	0.118	Si03	⋆
18	Ar	3.2060	1.00E+01	3.12E+00	3.75E+03	7.5E+02	X	G	2007	ICS-XRP	0.11	**Ay07**	
18	Ar	3.2060	1.00E+01	3.12E+00	4.40E+03		X	G	1970	ICS		**Do70**	◇
18	Ar	3.2060	1.01E+01	3.15E+00	2.81E+03	4.1E+02	X	G	1982	ICS	0.118	Hi82	⋆
18	Ar	3.2060	1.03E+01	3.22E+00	2.93E+03	3.9E+02	X	G	1982	ICS	0.121	Qu82	⋆
18	Ar	3.2060	1.06E+01	3.31E+00	2.75E+03	5.9E+02	X	G	1973	XRP	0.122	Ta73	
18	Ar	3.2060	1.10E+01	3.43E+00	2.83E+03	4.5E+02	X	G	1982	ICS	0.118	Hi82	⋆
18	Ar	3.2060	1.10E+01	3.43E+00	4.16E+03	8.3E+02	X	G	2007	ICS-XRP	0.11	**Ay07**	
18	Ar	3.2060	1.10E+01	3.43E+00	4.50E+03		X	G	1970	ICS		**Do70**	◇
18	Ar	3.2060	1.18E+01	3.69E+00	2.73E+03	3.4E+02	X	G	2003	ICS	0.118	Si03	⋆
18	Ar	3.2060	1.20E+01	3.76E+00	2.81E+03	4.6E+02	X	G	1982	ICS	0.118	Hi82	⋆
18	Ar	3.2060	1.26E+01	3.93E+00	2.78E+03	6.0E+02	X	G	1973	XRP	0.122	Ta73	
18	Ar	3.2060	1.38E+01	4.32E+00	2.75E+03	3.5E+02	X	G	2003	ICS	0.118	Si03	⋆

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
18	Ar	3.2060	1.47E+01	4.59E+00	2.72E+03	5.9E+02	X	G	1973	XRP	0.122	Ta73	
18	Ar	3.2060	1.59E+01	4.95E+00	2.78E+03	3.5E+02	X	G	2003	ICS	0.118	Si03	⋆
18	Ar	3.2060	1.68E+01	5.24E+00	2.62E+03	5.7E+02	X	G	1973	XRP	0.122	Ta73	
18	Ar	3.2060	1.79E+01	5.57E+00	2.63E+03	3.3E+02	X	G	2003	ICS	0.118	Si03	⋆
18	Ar	3.2060	1.89E+01	5.90E+00	2.57E+03	5.6E+02	X	G	1973	XRP	0.122	Ta73	
18	Ar	3.2060	1.98E+01	6.19E+00	2.42E+03	3.0E+02	X	G	2003	ICS	0.118	Si03	⋆
18	Ar	3.2060	2.19E+01	6.82E+00	2.50E+03	3.1E+02	X	G	2003	ICS	0.118	Si03	⋆
18	Ar	3.2060	2.39E+01	7.44E+00	2.35E+03	2.8E+02	X	G	2003	ICS	0.118	Si03	⋆
18	Ar	3.2060	2.00E+04	6.24E+03	8.09E+02	9.7E+01	X	T	1979	ICS	0.115	Ho79	
18	Ar	3.2060	3.00E+04	9.36E+03	8.35E+02	1.0E+02	X	T	1979	ICS	0.115	Ho79	
18	Ar	3.2060	4.00E+04	1.25E+04	8.68E+02	1.0E+02	X	T	1979	ICS	0.115	Ho79	
18	Ar	3.2060	5.00E+04	1.56E+04	8.66E+02	1.0E+02	X	T	1979	ICS	0.115	Ho79	
18	Ar	3.2060	6.00E+04	1.87E+04	9.20E+02	1.1E+02	X	T	1979	ICS	0.115	Ho79	
19	K	3.6074	3.75E+00	1.04E+00	2.00E+02	3.0E+01	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	4.00E+00	1.11E+00	5.10E+02	7.7E+01	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	4.50E+00	1.25E+00	7.00E+02	1.1E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	5.00E+00	1.39E+00	1.10E+03	1.7E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	6.00E+00	1.66E+00	1.47E+03	2.2E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	7.00E+00	1.94E+00	1.67E+03	2.5E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	8.00E+00	2.22E+00	1.74E+03	2.6E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	9.00E+00	2.49E+00	1.87E+03	2.8E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	1.00E+01	2.77E+00	2.03E+03	3.0E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	1.00E+01	2.77E+00	1.95E+03	3.0E+02	X	TS	2012	ICS	0.140	Wu12	
19	K	3.6074	1.10E+01	3.05E+00	2.12E+03	3.2E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	1.20E+01	3.33E+00	2.15E+03	3.2E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	1.30E+01	3.60E+00	2.17E+03	3.3E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	1.40E+01	3.88E+00	2.21E+03	3.5E+02	X	TS	2012	ICS	0.140	Wu12	
19	K	3.6074	1.50E+01	4.16E+00	2.12E+03	3.2E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	1.60E+01	4.44E+00	2.26E+03	3.5E+02	X	TS	2012	ICS	0.140	Wu12	
19	K	3.6074	1.75E+01	4.85E+00	2.05E+03	3.1E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	1.80E+01	4.99E+00	2.19E+03	3.6E+02	X	TS	2012	ICS	0.140	Wu12	
19	K	3.6074	2.00E+01	5.54E+00	1.98E+03	3.0E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	2.00E+01	5.54E+00	2.06E+03	3.2E+02	X	TS	2012	ICS	0.140	Wu12	
19	K	3.6074	2.20E+01	6.10E+00	2.18E+03	3.5E+02	X	TS	2012	ICS	0.140	Wu12	
19	K	3.6074	2.40E+01	6.65E+00	1.95E+03	2.9E+02	X	TS	2012	ICS	0.140	Wu12	
19	K	3.6074	2.50E+01	6.93E+00	1.82E+03	2.7E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	2.60E+01	7.21E+00	2.04E+03	3.3E+02	X	TS	2012	ICS	0.140	Wu12	
19	K	3.6074	2.80E+01	7.76E+00	2.04E+03	3.5E+02	X	TS	2012	ICS	0.140	Wu12	
19	K	3.6074	3.00E+01	8.32E+00	1.68E+03	2.5E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	3.00E+01	8.32E+00	1.92E+03	3.3E+02	X	TS	2012	ICS	0.140	Wu12	
19	K	3.6074	3.50E+01	9.70E+00	1.57E+03	2.4E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	4.00E+01	1.11E+01	1.42E+03	2.1E+02	X	G	1991	ICS	0.14	Sh91	
19	K	3.6074	4.50E+01	1.25E+01	1.32E+03	2.0E+02	X	G	1991	ICS	0.14	Sh91	
20	Ca	4.0381	4.50E+00	1.11E+00	4.30E+02	6.5E+01	X	G	1991	ICS	0.16	Sh91	
20	Ca	4.0381	5.00E+00	1.24E+00	5.10E+02	7.7E+01	X	G	1991	ICS	0.16	Sh91	
20	Ca	4.0381	5.50E+00	1.36E+00	5.90E+02	8.9E+01	X	G	1991	ICS	0.16	Sh91	
20	Ca	4.0381	6.00E+00	1.49E+00	8.70E+02	1.3E+02	X	G	1991	ICS	0.16	Sh91	
20	Ca	4.0381	7.00E+00	1.73E+00	1.00E+03	1.5E+02	X	G	1991	ICS	0.16	Sh91	
20	Ca	4.0381	7.00E+00	1.73E+00	8.67E+02	1.3E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	8.00E+00	1.98E+00	1.05E+03	1.6E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	8.00E+00	1.98E+00	1.12E+03	1.7E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	9.00E+00	2.23E+00	1.14E+03	1.7E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	9.00E+00	2.23E+00	1.24E+03	1.9E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	1.00E+01	2.48E+00	1.27E+03	1.9E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	1.00E+01	2.48E+00	1.36E+03	2.0E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	1.10E+01	2.72E+00	1.31E+03	2.0E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	1.10E+01	2.72E+00	1.47E+03	2.2E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	1.20E+01	2.97E+00	1.37E+03	2.1E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	1.20E+01	2.97E+00	1.52E+03	2.3E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	1.30E+01	3.22E+00	1.49E+03	2.2E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	1.30E+01	3.22E+00	1.60E+03	2.4E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	1.40E+01	3.47E+00	1.58E+03	2.4E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	1.40E+01	3.47E+00	1.59E+03	2.4E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	1.50E+01	3.71E+00	1.59E+03	2.4E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	1.60E+01	3.96E+00	1.57E+03	2.4E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	1.60E+01	3.96E+00	1.62E+03	2.4E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	1.70E+01	4.21E+00	1.53E+03	2.3E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	1.80E+01	4.46E+00	1.52E+03	2.3E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	1.80E+01	4.46E+00	1.65E+03	2.5E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	2.00E+01	4.95E+00	1.50E+03	2.3E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	2.00E+01	4.95E+00	1.66E+03	2.5E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	2.20E+01	5.45E+00	1.63E+03	2.4E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	2.40E+01	5.94E+00	1.57E+03	2.4E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	2.50E+01	6.19E+00	1.44E+03	2.2E+02	X	G	1991	ICS	0.163	Sh91	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
20	Ca	4.0381	2.60E+01	6.44E+00	1.52E+03	2.3E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	2.80E+01	6.93E+00	1.49E+03	2.2E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	3.00E+01	7.43E+00	1.37E+03	2.1E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	3.00E+01	7.43E+00	1.41E+03	2.1E+02	X	TS	2010	ICS	0.174	Wu10	
20	Ca	4.0381	3.50E+01	8.67E+00	1.29E+03	1.9E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	4.00E+01	9.91E+00	1.14E+03	1.7E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	4.50E+01	1.11E+01	1.07E+03	1.6E+02	X	G	1991	ICS	0.163	Sh91	
20	Ca	4.0381	1.00E+02	2.48E+01	4.37E+02	6.6E+01	X	T	1987	ICS	0.163	**We87b**	⋆
20	Ca	4.0381	2.00E+04	4.95E+03	6.09E+02	7.9E+01	X	T	1979	ICS	0.163	Ho79	
20	Ca	4.0381	3.50E+04	8.67E+03	6.52E+02	8.5E+01	X	T	1979	ICS	0.163	Ho79	
20	Ca	4.0381	5.00E+04	1.24E+04	6.95E+02	9.0E+01	X	T	1979	ICS	0.163	Ho79	
20	Ca	4.0381	6.00E+04	1.49E+04	7.12E+02	9.3E+01	X	T	1979	ICS	0.163	Ho79	
20	Ca	4.0381	7.00E+04	1.73E+04	8.89E+02	3.6E+02	X	T	1977	ICS	0.163	Is77	
20	Ca	4.0381	1.50E+05	3.71E+04	9.08E+02	3.6E+02	X	T	1977	ICS	0.163	Is77	
20	Ca	4.0381	2.70E+05	6.69E+04	1.05E+03	4.2E+02	X	T	1977	ICS	0.163	Is77	
21	Sc	4.4928	4.80E+00	1.07E+00	7.60E+01	1.4E+01	X	TS	2000	ICS	0.19	An00	
21	Sc	4.4928	7.10E+00	1.58E+00	8.32E+02	1.4E+02	X	TS	2000	ICS	0.19	An00	
21	Sc	4.4928	8.90E+00	1.98E+00	1.14E+03	2.0E+02	X	TS	2000	ICS	0.19	An00	
21	Sc	4.4928	1.10E+01	2.45E+00	1.23E+03	2.2E+02	X	TS	2000	ICS	0.19	An00	
21	Sc	4.4928	1.28E+01	2.85E+00	1.23E+03	2.3E+02	X	TS	2000	ICS	0.19	An00	
21	Sc	4.4928	1.51E+01	3.36E+00	1.30E+03	2.4E+02	X	TS	2000	ICS	0.19	An00	
21	Sc	4.4928	1.71E+01	3.81E+00	1.31E+03	2.5E+02	X	TS	2000	ICS	0.19	An00	
21	Sc	4.4928	2.00E+01	4.45E+00	1.27E+03	2.5E+02	X	TS	2000	ICS	0.19	An00	
21	Sc	4.4928	2.30E+01	5.12E+00	1.18E+03	2.4E+02	X	TS	2000	ICS	0.19	An00	
21	Sc	4.4928	2.70E+01	6.01E+00	1.19E+03	2.4E+02	X	TS	2000	ICS	0.19	An00	
21	Sc	4.4928	3.10E+01	6.90E+00	1.08E+03	2.2E+02	X	TS	2000	ICS	0.19	An00	
21	Sc	4.4928	3.50E+01	7.79E+00	1.06E+03	2.3E+02	X	TS	2000	ICS	0.19	An00	
21	Sc	4.4928	4.00E+01	8.90E+00	9.77E+02	2.2E+02	X	TS	2000	ICS	0.19	An00	
21	Sc	4.4928	4.50E+01	1.00E+01	9.07E+02	2.9E+02	X	TS	2000	ICS	0.19	An00	
22	Ti	4.9664	5.50E+00	1.11E+00	3.60E+01	5.0E+00	X	TS	1997	ICS		He97	
22	Ti	4.9664	5.60E+00	1.13E+00	2.40E+02	2.4E+01	X	TS	2003	ICS	0.218	An03	
22	Ti	4.9664	5.91E+00	1.19E+00	4.99E+02	3.0E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	6.00E+00	1.21E+00	4.85E+02	5.0E+00	X	TS	2012	ICS	0.214	Li12	
22	Ti	4.9664	6.00E+00	1.21E+00	1.02E+02	1.3E+01	X	TS	1997	ICS		He97	
22	Ti	4.9664	6.40E+00	1.29E+00	4.84E+02	4.8E+01	X	TS	2003	ICS	0.218	An03	
22	Ti	4.9664	6.46E+00	1.30E+00	6.58E+02	4.0E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	7.00E+00	1.41E+00	7.73E+02	5.0E+00	X	TS	2012	ICS	0.214	Li12	
22	Ti	4.9664	7.00E+00	1.41E+00	3.64E+02	4.0E+01	X	TS	1997	ICS		He97	
22	Ti	4.9664	7.00E+00	1.41E+00	8.46E+02	4.7E+01	X	S	2020	ICS	0.218	**Li20**	
22	Ti	4.9664	7.30E+00	1.47E+00	7.94E+02	7.9E+01	X	TS	2003	ICS	0.218	An03	
22	Ti	4.9664	7.45E+00	1.50E+00	9.09E+02	5.5E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	8.00E+00	1.61E+00	9.50E+02	2.0E+01	X	TS	2012	ICS	0.214	Li12	
22	Ti	4.9664	8.30E+00	1.67E+00	9.74E+02	9.7E+01	X	TS	2003	ICS	0.218	An03	
22	Ti	4.9664	8.44E+00	1.70E+00	1.07E+03	6.4E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	9.00E+00	1.81E+00	1.15E+03	5.0E+01	X	TS	2012	ICS	0.214	Li12	
22	Ti	4.9664	9.00E+00	1.81E+00	5.15E+02	5.5E+01	X	TS	1997	ICS		He97	
22	Ti	4.9664	9.40E+00	1.89E+00	1.13E+03	1.1E+02	X	TS	2003	ICS	0.218	An03	
22	Ti	4.9664	9.44E+00	1.90E+00	1.20E+03	7.2E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	9.98E+00	2.01E+00	1.26E+03	7.6E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	1.00E+01	2.01E+00	1.20E+03	2.0E+01	X	TS	2012	ICS	0.214	Li12	
22	Ti	4.9664	1.00E+01	2.01E+00	6.49E+02	6.9E+01	X	TS	1997	ICS		He97	
22	Ti	4.9664	1.00E+01	2.01E+00	1.31E+03	7.1E+01	X	S	2020	ICS	0.218	**Li20**	
22	Ti	4.9664	1.04E+01	2.10E+00	1.30E+03	7.8E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	1.09E+01	2.19E+00	1.31E+03	1.3E+02	X	TS	2003	ICS	0.218	An03	
22	Ti	4.9664	1.15E+01	2.31E+00	1.35E+03	8.1E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	1.20E+01	2.42E+00	1.37E+03	5.0E+01	X	TS	2012	ICS	0.214	Li12	
22	Ti	4.9664	1.20E+01	2.42E+00	8.80E+02	9.4E+01	X	TS	1997	ICS		He97	
22	Ti	4.9664	1.22E+01	2.46E+00	1.38E+03	1.4E+02	X	TS	2003	ICS	0.218	An03	
22	Ti	4.9664	1.25E+01	2.51E+00	1.38E+03	8.3E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	1.30E+01	2.62E+00	1.47E+03	8.3E+01	X	S	2020	ICS	0.218	**Li20**	
22	Ti	4.9664	1.34E+01	2.70E+00	1.40E+03	8.4E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	1.40E+01	2.82E+00	8.85E+02	9.5E+01	X	TS	1997	ICS		He97	
22	Ti	4.9664	1.42E+01	2.86E+00	1.51E+03	1.5E+02	X	TS	2003	ICS	0.218	An03	
22	Ti	4.9664	1.47E+01	2.96E+00	1.54E+03	1.5E+02	X	TS	2003	ICS	0.218	An03	
22	Ti	4.9664	1.49E+01	3.01E+00	1.42E+03	8.5E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	1.50E+01	3.02E+00	1.43E+03	4.0E+01	X	TS	2012	ICS	0.214	Li12	
22	Ti	4.9664	1.50E+01	3.02E+00	1.50E+03	8.3E+01	X	S	2020	ICS	0.218	**Li20**	
22	Ti	4.9664	1.60E+01	3.22E+00	1.13E+03	1.2E+02	X	TS	1997	ICS		He97	
22	Ti	4.9664	1.60E+01	3.22E+00	1.49E+03	1.5E+02	X	TS	2003	ICS	0.218	An03	
22	Ti	4.9664	1.70E+01	3.42E+00	1.50E+03	8.9E+01	X	S	2020	ICS	0.218	**Li20**	
22	Ti	4.9664	1.80E+01	3.62E+00	1.42E+03	8.5E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	1.83E+01	3.68E+00	1.47E+03	1.5E+02	X	TS	2003	ICS	0.218	An03	
22	Ti	4.9664	2.00E+01	4.03E+00	1.50E+03	9.0E+01	X	TS	2012	ICS	0.214	Li12	
22	Ti	4.9664	2.00E+01	4.03E+00	1.21E+03	1.3E+02	X	TS	1997	ICS		He97	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
22	Ti	4.9664	2.00E+01	4.03E+00	1.48E+03	8.3E+01	X	S	2020	ICS	0.218	**Li20**	
22	Ti	4.9664	2.02E+01	4.07E+00	1.44E+03	1.4E+02	X	TS	2003	ICS	0.218	An03	
22	Ti	4.9664	2.20E+01	4.43E+00	1.46E+03	8.3E+01	X	S	2020	ICS	0.218	**Li20**	
22	Ti	4.9664	2.24E+01	4.51E+00	1.47E+03	1.5E+02	X	TS	2003	ICS	0.218	An03	
22	Ti	4.9664	2.30E+01	4.63E+00	1.36E+03	8.2E+01	X	T	1975	ICS	0.220	Je75	
22	Ti	4.9664	2.50E+01	5.03E+00	1.43E+03	5.0E+01	X	TS	2012	ICS	0.214	Li12	
22	Ti	4.9664	2.50E+01	5.03E+00	1.13E+03	1.2E+02	X	TS	1997	ICS		He97	
22	Ti	4.9664	2.50E+01	5.03E+00	1.42E+03	7.7E+01	X	S	2020	ICS	0.218	**Li20**	
22	Ti	4.9664	2.59E+01	5.22E+00	1.44E+03	1.4E+02	X	TS	2003	ICS	0.218	An03	
22	Ti	4.9664	2.70E+01	5.44E+00	1.38E+03	7.7E+01	X	S	2020	ICS	0.218	**Li20**	
22	Ti	4.9664	2.80E+01	5.64E+00	1.29E+03	7.8E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	2.90E+01	5.84E+00	1.06E+03	1.1E+02	X	TS	1997	ICS		He97	
22	Ti	4.9664	3.30E+01	6.64E+00	1.22E+03	7.3E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	3.80E+01	7.65E+00	1.15E+03	6.9E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	4.30E+01	8.66E+00	1.09E+03	6.5E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	4.70E+01	9.46E+00	1.05E+03	6.3E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	4.98E+01	1.00E+01	1.03E+03	6.2E+01	X	T	1975	ICS	0.22	Je75	
22	Ti	4.9664	3.00E+05	6.04E+04	5.71E+02	5.2E+01	X	T	1987	ICS		**Wa87**	⋆
23	V	5.4651	5.90E+00	1.08E+00	3.40E+01	5.0E+00	X	TS	2000	ICS	0.25	An00	
23	V	5.4651	7.90E+00	1.45E+00	4.55E+02	1.0E+02	X	TS	2000	ICS	0.25	An00	
23	V	5.4651	9.90E+00	1.81E+00	7.64E+02	1.3E+02	X	TS	2000	ICS	0.25	An00	
23	V	5.4651	1.17E+01	2.14E+00	9.05E+02	1.4E+02	X	TS	2000	ICS	0.25	An00	
23	V	5.4651	1.40E+01	2.56E+00	9.91E+02	1.6E+02	X	TS	2000	ICS	0.25	An00	
23	V	5.4651	1.62E+01	2.96E+00	1.08E+03	1.7E+02	X	TS	2000	ICS	0.25	An00	
23	V	5.4651	2.00E+01	3.66E+00	1.11E+03	1.7E+02	X	TS	2000	ICS	0.25	An00	
23	V	5.4651	2.40E+01	4.39E+00	1.04E+03	1.6E+02	X	TS	2000	ICS	0.25	An00	
23	V	5.4651	2.80E+01	5.12E+00	9.88E+02	1.6E+02	X	TS	2000	ICS	0.25	An00	
23	V	5.4651	3.20E+01	5.86E+00	9.77E+02	1.5E+02	X	TS	2000	ICS	0.25	An00	
23	V	5.4651	3.61E+01	6.61E+00	8.50E+02	1.5E+02	X	TS	2000	ICS	0.25	An00	
23	V	5.4651	3.99E+01	7.30E+00	8.17E+02	1.5E+02	X	TS	2000	ICS	0.25	An00	
23	V	5.4651	4.50E+01	8.23E+00	7.94E+02	1.6E+02	X	TS	2000	ICS	0.25	An00	
23	V	5.4651	1.00E+02	1.83E+01	2.63E+02	3.9E+01	X	T	1987	ICS	0.25	**We87b**	⋆
23	V	5.4651	2.04E+03	3.73E+02	3.47E+02	1.7E+01	X	T	1972	ICS	0.25	Sc72	¶
24	Cr	5.9892	6.00E+00	1.00E+00	32.0	4.0	X	TS	1996	ICS		Lu96	
24	Cr	5.9892	6.00E+00	1.00E+00	23.0	3.0	X	TS	1997	ICS		He97	
24	Cr	5.9892	6.25E+00	1.04E+00	91	11	X	TS	1996	ICS		Lu96	
24	Cr	5.9892	6.25E+00	1.04E+00	64.0	8.0	X	TS	1997	ICS		He97	
24	Cr	5.9892	6.50E+00	1.09E+00	168	18	X	TS	1996	ICS		Lu96	
24	Cr	5.9892	6.50E+00	1.09E+00	119	13	X	TS	1997	ICS		He97	
24	Cr	5.9892	6.50E+00	1.09E+00	143	14	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	6.90E+00	1.15E+00	242	24	X	TS	2003	ICS	0.286	An03	
24	Cr	5.9892	7.00E+00	1.17E+00	199	22	X	TS	1996	ICS		Lu96	
24	Cr	5.9892	7.00E+00	1.17E+00	141	14	X	TS	1997	ICS		He97	
24	Cr	5.9892	7.00E+00	1.17E+00	283	28	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	7.50E+00	1.25E+00	393	39	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	8.00E+00	1.34E+00	425	49	X	TS	1996	ICS		Lu96	
24	Cr	5.9892	8.00E+00	1.34E+00	300	29	X	TS	1997	ICS		He97	
24	Cr	5.9892	8.00E+00	1.34E+00	485	49	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	8.50E+00	1.42E+00	556	56	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	8.80E+00	1.47E+00	600	60	X	TS	2003	ICS	0.286	An03	
24	Cr	5.9892	9.00E+00	1.50E+00	606	61	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	1.00E+01	1.67E+00	666	80	X	TS	1996	ICS		Lu96	
24	Cr	5.9892	1.00E+01	1.67E+00	471	43	X	TS	1997	ICS		He97	
24	Cr	5.9892	1.00E+01	1.67E+00	721	72	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	1.08E+01	1.80E+00	777	78	X	TS	2003	ICS	0.286	An03	
24	Cr	5.9892	1.10E+01	1.84E+00	796	80	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	1.20E+01	2.00E+00	854	107	X	TS	1996	ICS		Lu96	
24	Cr	5.9892	1.20E+01	2.00E+00	604	53	X	TS	1997	ICS		He97	
24	Cr	5.9892	1.20E+01	2.00E+00	856	86	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	1.27E+01	2.12E+00	1041	104	X	TS	2003	ICS	0.286	An03	
24	Cr	5.9892	1.30E+01	2.17E+00	880	88	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	1.40E+01	2.34E+00	969	125	X	TS	1996	ICS		Lu96	
24	Cr	5.9892	1.40E+01	2.34E+00	685	58	X	TS	1997	ICS		He97	
24	Cr	5.9892	1.40E+01	2.34E+00	913	91	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	1.40E+01	2.34E+00	1005	101	X	TS	2003	ICS	0.286	An03	
24	Cr	5.9892	1.50E+01	2.50E+00	920	92	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	1.59E+01	2.65E+00	1025	103	X	TS	2003	ICS	0.286	An03	
24	Cr	5.9892	1.60E+01	2.67E+00	994	132	X	TS	1996	ICS		Lu96	
24	Cr	5.9892	1.60E+01	2.67E+00	703	58	X	TS	1997	ICS		He97	
24	Cr	5.9892	1.60E+01	2.67E+00	946	95	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	1.70E+01	2.84E+00	953	95	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	1.80E+01	3.01E+00	970	97	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	1.84E+01	3.07E+00	1054	105	X	TS	2003	ICS	0.286	An03	
24	Cr	5.9892	1.90E+01	3.17E+00	967	97	X	T	2000	ICS	0.286	Ll00	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
24	Cr	5.9892	2.00E+01	3.34E+00	1020	144	X	TS	1996	ICS		Lu96	
24	Cr	5.9892	2.00E+01	3.34E+00	721	59	X	TS	1997	ICS		He97	
24	Cr	5.9892	2.00E+01	3.34E+00	967	97	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	2.06E+01	3.44E+00	1023	102	X	TS	2003	ICS	0.286	An03	
24	Cr	5.9892	2.10E+01	3.51E+00	970	97	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	2.20E+01	3.67E+00	966	97	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	2.23E+01	3.72E+00	1055	106	X	TS	2003	ICS	0.286	An03	
24	Cr	5.9892	2.30E+01	3.84E+00	964	133	X	TS	1996	ICS		Lu96	
24	Cr	5.9892	2.30E+01	3.84E+00	682	51	X	TS	1997	ICS		He97	
24	Cr	5.9892	2.30E+01	3.84E+00	970	97	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	2.40E+01	4.01E+00	965	97	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	2.44E+01	4.07E+00	986	99	X	TS	2003	ICS	0.286	An03	
24	Cr	5.9892	2.50E+01	4.17E+00	907	125	X	TS	1996	ICS		Lu96	
24	Cr	5.9892	2.50E+01	4.17E+00	641	44	X	TS	1997	ICS		He97	
24	Cr	5.9892	2.50E+01	4.17E+00	940	94	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	2.60E+01	4.34E+00	958	96	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	2.66E+01	4.44E+00	1030	103	X	TS	2003	ICS	0.286	An03	
24	Cr	5.9892	2.70E+01	4.51E+00	938	94	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	2.80E+01	4.68E+00	952	95	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	2.90E+01	4.84E+00	932	93	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	3.00E+01	5.01E+00	922	92	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	3.10E+01	5.18E+00	918	92	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	3.20E+01	5.34E+00	911	91	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	3.30E+01	5.51E+00	896	90	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	3.40E+01	5.68E+00	897	90	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	3.50E+01	5.84E+00	899	90	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	3.60E+01	6.01E+00	874	87	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	3.80E+01	6.34E+00	848	85	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	4.00E+01	6.68E+00	832	83	X	T	2000	ICS	0.286	Ll00	
24	Cr	5.9892	2.04E+03	3.41E+02	267	13	X	T	1972	ICS	0.282	Sc72	¶
24	Cr	5.9892	2.00E+04	3.34E+03	450	45	X	T	1979	ICS	0.282	Ho79	
24	Cr	5.9892	3.50E+04	5.84E+03	501	50	X	T	1979	ICS	0.282	Ho79	
24	Cr	5.9892	5.00E+04	8.35E+03	502	50	X	T	1979	ICS	0.282	Ho79	
24	Cr	5.9892	6.00E+04	1.00E+04	528	53	X	T	1979	ICS	0.282	Ho79	
25	Mn	6.5390	6.71E+00	1.03E+00	2.70E+01	6.0E+00	X	T	1980	ICS	0.308	Sh80	
25	Mn	6.5390	6.90E+00	1.06E+00	6.90E+01	1.3E+01	X	T	1980	ICS	0.308	Sh80	
25	Mn	6.5390	6.91E+00	1.06E+00	4.27E+01	6.1E+00	X	TS	1999	ICS	0.314	Ta99b	
25	Mn	6.5390	7.00E+00	1.07E+00	1.01E+02	1.0E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	7.40E+00	1.13E+00	1.52E+02	3.0E+01	X	T	1980	ICS	0.308	Sh80	
25	Mn	6.5390	7.50E+00	1.15E+00	1.32E+02	1.8E+01	X	TS	1997	ICS	0.314	Lu97	
25	Mn	6.5390	7.50E+00	1.15E+00	2.22E+02	2.2E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	8.00E+00	1.22E+00	2.45E+02	3.1E+01	X	T	1980	ICS	0.308	Sh80	
25	Mn	6.5390	8.00E+00	1.22E+00	3.17E+02	3.2E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	8.47E+00	1.29E+00	3.23E+02	4.4E+01	X	TS	1999	ICS	0.314	Ta99b	
25	Mn	6.5390	8.50E+00	1.30E+00	4.05E+02	4.1E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	9.00E+00	1.38E+00	3.59E+02	3.9E+01	X	T	1980	ICS	0.308	Sh80	
25	Mn	6.5390	9.00E+00	1.38E+00	4.76E+02	4.8E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	9.49E+00	1.45E+00	4.70E+02	6.6E+01	X	TS	1997	ICS	0.314	Lu97	
25	Mn	6.5390	9.50E+00	1.45E+00	5.42E+02	5.4E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	9.97E+00	1.52E+00	4.75E+02	6.6E+01	X	TS	1999	ICS	0.314	Ta99b	
25	Mn	6.5390	1.00E+01	1.53E+00	5.74E+02	5.7E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	1.10E+01	1.68E+00	5.28E+02	5.5E+01	X	T	1980	ICS	0.308	Sh80	
25	Mn	6.5390	1.10E+01	1.68E+00	6.62E+02	6.6E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	1.15E+01	1.76E+00	5.95E+02	8.6E+01	X	TS	1999	ICS	0.314	Ta99b	
25	Mn	6.5390	1.15E+01	1.76E+00	6.15E+02	8.9E+01	X	TS	1997	ICS	0.314	Lu97	
25	Mn	6.5390	1.20E+01	1.84E+00	7.13E+02	7.1E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	1.30E+01	1.99E+00	7.55E+02	7.6E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	1.35E+01	2.07E+00	6.42E+02	9.6E+01	X	TS	1999	ICS	0.314	Ta99b	
25	Mn	6.5390	1.35E+01	2.07E+00	6.71E+02	1.0E+02	X	TS	1997	ICS	0.314	Lu97	
25	Mn	6.5390	1.40E+01	2.14E+00	8.06E+02	8.1E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	1.50E+01	2.29E+00	6.67E+02	7.0E+01	X	T	1980	ICS	0.308	Sh80	
25	Mn	6.5390	1.50E+01	2.29E+00	8.20E+02	8.2E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	1.56E+01	2.38E+00	6.80E+02	1.0E+02	X	TS	1999	ICS	0.314	Ta99b	
25	Mn	6.5390	1.56E+01	2.39E+00	6.99E+02	1.1E+02	X	TS	1997	ICS	0.314	Lu97	
25	Mn	6.5390	1.60E+01	2.45E+00	8.54E+02	8.5E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	1.70E+01	2.60E+00	8.52E+02	8.5E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	1.77E+01	2.71E+00	6.94E+02	1.1E+02	X	TS	1999	ICS	0.314	Ta99b	
25	Mn	6.5390	1.78E+01	2.73E+00	6.91E+02	1.1E+02	X	TS	1997	ICS	0.314	Lu97	
25	Mn	6.5390	1.80E+01	2.75E+00	8.71E+02	8.7E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	1.90E+01	2.91E+00	8.53E+02	8.5E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	1.96E+01	3.00E+00	7.35E+02	1.2E+02	X	TS	1999	ICS	0.314	Ta99b	
25	Mn	6.5390	1.99E+01	3.04E+00	7.47E+02	1.2E+02	X	TS	1997	ICS	0.314	Lu97	
25	Mn	6.5390	2.00E+01	3.06E+00	6.90E+02	7.1E+01	X	T	1980	ICS	0.308	Sh80	
25	Mn	6.5390	2.00E+01	3.06E+00	8.69E+02	8.7E+01	X	T	2002	ICS	0.319	Ll02	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
25	Mn	6.5390	2.10E+01	3.21E+00	8.57E+02	8.6E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	2.17E+01	3.32E+00	7.48E+02	1.2E+02	X	TS	1997	ICS	0.314	Lu97	
25	Mn	6.5390	2.18E+01	3.33E+00	7.27E+02	1.2E+02	X	TS	1999	ICS	0.314	Ta99b	
25	Mn	6.5390	2.20E+01	3.36E+00	8.48E+02	8.5E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	2.30E+01	3.52E+00	8.65E+02	8.7E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	2.37E+01	3.62E+00	7.65E+02	1.3E+02	X	TS	1997	ICS	0.314	Lu97	
25	Mn	6.5390	2.37E+01	3.63E+00	7.01E+02	1.2E+02	X	TS	1999	ICS	0.314	Ta99b	
25	Mn	6.5390	2.40E+01	3.67E+00	8.99E+02	9.0E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	2.50E+01	3.82E+00	8.43E+02	8.4E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	2.56E+01	3.92E+00	7.05E+02	1.2E+02	X	TS	1999	ICS	0.314	Ta99b	
25	Mn	6.5390	2.59E+01	3.96E+00	7.28E+02	1.3E+02	X	TS	1997	ICS	0.314	Lu97	
25	Mn	6.5390	2.60E+01	3.98E+00	8.57E+02	8.6E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	2.70E+01	4.13E+00	8.36E+02	8.4E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	2.80E+01	4.28E+00	8.57E+02	8.6E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	2.90E+01	4.43E+00	8.36E+02	8.4E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	3.00E+01	4.59E+00	8.33E+02	8.3E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	3.10E+01	4.74E+00	8.29E+02	8.3E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	3.20E+01	4.89E+00	8.20E+02	8.2E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	3.30E+01	5.05E+00	8.15E+02	8.2E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	3.40E+01	5.20E+00	7.99E+02	8.0E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	3.50E+01	5.35E+00	7.94E+02	7.9E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	3.60E+01	5.51E+00	7.81E+02	7.8E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	3.70E+01	5.66E+00	8.04E+02	8.0E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	3.80E+01	5.81E+00	7.65E+02	7.7E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	3.90E+01	5.96E+00	7.50E+02	7.5E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	4.00E+01	6.12E+00	7.45E+02	7.5E+01	X	T	2002	ICS	0.319	Ll02	
25	Mn	6.5390	5.00E+01	7.65E+00	6.14E+02	1.4E+02	X	T	1967	ICS	0.291	Fi67	
25	Mn	6.5390	2.04E+03	3.12E+02	2.70E+02	3.2E+01	X	T	1972	ICS	0.314	Sc72	¶
25	Mn	6.5390	5.00E+04	7.65E+03	4.34E+02	3.9E+01	X	T	1979	ICS	0.314	Ho79	
25	Mn	6.5390	3.00E+05	4.59E+04	5.22E+02	4.9E+01	X	T	1987	ICS	0.313	**Wa87**	⋆
25	Mn	6.5390	3.50E+05	5.35E+04	4.49E+02	4.7E+01	X	T	1987	ICS	0.313	**Wa87**	⋆
26	Fe	7.1120	7.50E+00	1.05E+00	6.60E+01	7.7E+00	X	TS	1996	ICS	0.374	He96a	
26	Fe	7.1120	7.50E+00	1.05E+00	4.70E+01	4.7E+00	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	7.93E+00	1.12E+00	1.06E+02	1.2E+01	X	TS	1997	ICS	0.374	Lu97	
26	Fe	7.1120	8.00E+00	1.12E+00	9.94E+01	9.8E+00	X	TS	1996	ICS	0.374	He96a	
26	Fe	7.1120	8.00E+00	1.12E+00	1.36E+02	1.4E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	8.30E+00	1.17E+00	2.26E+02	2.9E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	8.50E+00	1.20E+00	2.16E+02	2.2E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	9.00E+00	1.27E+00	2.25E+02	1.7E+01	X	TS	1996	ICS	0.374	He96a	
26	Fe	7.1120	9.00E+00	1.27E+00	2.74E+02	2.7E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	9.50E+00	1.34E+00	3.30E+02	3.3E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	9.70E+00	1.36E+00	3.26E+02	4.2E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	1.00E+01	1.41E+00	3.63E+02	4.2E+01	X	TS	1997	ICS	0.374	Lu97	
26	Fe	7.1120	1.00E+01	1.41E+00	3.61E+02	2.4E+01	X	TS	1996	ICS	0.374	He96a	
26	Fe	7.1120	1.00E+01	1.41E+00	3.68E+02	3.7E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	1.10E+01	1.55E+00	4.06E+02	2.6E+01	X	TS	1996	ICS	0.374	He96a	
26	Fe	7.1120	1.10E+01	1.55E+00	4.42E+02	4.4E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	1.10E+01	1.55E+00	4.32E+02	5.6E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	1.20E+01	1.69E+00	5.77E+02	3.8E+01	X	TS	1996	ICS	0.374	He96a	
26	Fe	7.1120	1.20E+01	1.69E+00	5.00E+02	5.0E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	1.21E+01	1.69E+00	4.82E+02	5.9E+01	X	TS	1997	ICS	0.374	Lu97	
26	Fe	7.1120	1.23E+01	1.73E+00	5.22E+02	6.8E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	1.30E+01	1.83E+00	5.41E+02	5.4E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	1.36E+01	1.91E+00	5.73E+02	7.4E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	1.40E+01	1.97E+00	7.65E+02	5.0E+01	X	TS	1996	ICS	0.374	He96a	
26	Fe	7.1120	1.40E+01	1.97E+00	5.73E+02	5.7E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	1.42E+01	2.00E+00	6.13E+02	7.8E+01	X	TS	1997	ICS	0.374	Lu97	
26	Fe	7.1120	1.49E+01	2.10E+00	6.12E+02	8.0E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	1.50E+01	2.11E+00	6.00E+02	6.0E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	1.60E+01	2.25E+00	8.13E+02	5.2E+01	X	TS	1996	ICS	0.374	He96a	
26	Fe	7.1120	1.60E+01	2.25E+00	6.16E+02	6.2E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	1.62E+01	2.28E+00	6.24E+02	8.1E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	1.63E+01	2.29E+00	6.80E+02	8.8E+01	X	TS	1997	ICS	0.374	Lu97	
26	Fe	7.1120	1.70E+01	2.39E+00	6.26E+02	6.3E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	1.75E+01	2.46E+00	6.40E+02	8.3E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	1.80E+01	2.53E+00	8.56E+02	5.5E+01	X	TS	1996	ICS	0.374	He96a	
26	Fe	7.1120	1.80E+01	2.53E+00	6.39E+02	6.4E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	1.84E+01	2.58E+00	6.90E+02	9.1E+01	X	TS	1997	ICS	0.374	Lu97	
26	Fe	7.1120	1.88E+01	2.64E+00	6.55E+02	8.5E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	1.90E+01	2.67E+00	6.51E+02	6.5E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	2.00E+01	2.81E+00	8.87E+02	5.5E+01	X	TS	1996	ICS	0.374	He96a	
26	Fe	7.1120	2.00E+01	2.81E+00	6.50E+02	6.5E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	2.02E+01	2.84E+00	6.82E+02	8.9E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	2.04E+01	2.87E+00	6.83E+02	9.3E+01	X	TS	1997	ICS	0.374	Lu97	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
26	Fe	7.1120	2.10E+01	2.95E+00	6.63E+02	6.6E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	2.15E+01	3.02E+00	6.81E+02	8.9E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	2.20E+01	3.09E+00	8.50E+02	5.9E+01	X	TS	1996	ICS	0.374	He96a	
26	Fe	7.1120	2.20E+01	3.09E+00	6.52E+02	6.5E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	2.23E+01	3.14E+00	7.07E+02	1.0E+02	X	TS	1997	ICS	0.374	Lu97	
26	Fe	7.1120	2.28E+01	3.21E+00	6.51E+02	8.5E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	2.30E+01	3.23E+00	6.73E+02	6.7E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	2.40E+01	3.37E+00	6.67E+02	6.7E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	2.41E+01	3.39E+00	6.63E+02	8.6E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	2.48E+01	3.49E+00	6.98E+02	9.8E+01	X	TS	1997	ICS	0.374	Lu97	
26	Fe	7.1120	2.50E+01	3.52E+00	8.77E+02	5.7E+01	X	TS	1996	ICS	0.374	He96a	
26	Fe	7.1120	2.50E+01	3.52E+00	6.65E+02	6.7E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	2.54E+01	3.57E+00	6.74E+02	8.8E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	2.60E+01	3.66E+00	6.60E+02	6.6E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	2.68E+01	3.77E+00	6.86E+02	8.9E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	2.70E+01	3.80E+00	6.64E+02	6.6E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	2.80E+01	3.94E+00	8.69E+02	5.8E+01	X	TS	1996	ICS	0.374	He96a	
26	Fe	7.1120	2.80E+01	3.94E+00	6.61E+02	6.6E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	2.80E+01	3.94E+00	7.02E+02	9.1E+01	X	T	2020	ICS	0.336	**Ti20**	
26	Fe	7.1120	2.90E+01	4.08E+00	6.51E+02	6.5E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	3.00E+01	4.22E+00	6.47E+02	6.5E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	3.10E+01	4.36E+00	6.46E+02	6.5E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	3.20E+01	4.50E+00	6.39E+02	6.4E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	3.30E+01	4.64E+00	6.32E+02	6.3E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	3.40E+01	4.78E+00	6.35E+02	6.4E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	3.50E+01	4.92E+00	6.29E+02	6.3E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	3.60E+01	5.06E+00	6.19E+02	6.2E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	3.70E+01	5.20E+00	6.21E+02	6.2E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	3.80E+01	5.34E+00	6.08E+02	6.1E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	3.90E+01	5.48E+00	6.04E+02	6.0E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	4.00E+01	5.62E+00	6.14E+02	6.1E+01	X	T	2002	ICS	0.351	Ll02	
26	Fe	7.1120	2.04E+03	2.87E+02	2.52E+02	1.3E+01	X	T	1972	ICS	0.347	Sc72	¶
27	Co	7.7089	8.50E+00	1.10E+00	8.60E+01	1.1E+01	X	TS	1996	ICS	0.381	An96	
27	Co	7.7089	1.06E+01	1.37E+00	3.14E+02	4.0E+01	X	TS	1996	ICS	0.381	An96	
27	Co	7.7089	1.27E+01	1.64E+00	4.54E+02	5.7E+01	X	TS	1996	ICS	0.381	An96	
27	Co	7.7089	1.48E+01	1.92E+00	5.02E+02	6.8E+01	X	TS	1996	ICS	0.381	An96	
27	Co	7.7089	1.67E+01	2.17E+00	5.26E+02	6.9E+01	X	TS	1996	ICS	0.381	An96	
27	Co	7.7089	1.87E+01	2.42E+00	5.75E+02	7.7E+01	X	TS	1996	ICS	0.381	An96	
27	Co	7.7089	2.09E+01	2.70E+00	5.68E+02	7.6E+01	X	TS	1996	ICS	0.381	An96	
27	Co	7.7089	2.28E+01	2.96E+00	5.47E+02	7.4E+01	X	TS	1996	ICS	0.381	An96	
27	Co	7.7089	2.49E+01	3.23E+00	5.25E+02	7.6E+01	X	TS	1996	ICS	0.381	An96	
27	Co	7.7089	2.04E+03	2.65E+02	2.39E+02	2.0E+01	X	T	1972	ICS	0.381	Sc72	¶
28	Ni	8.3328	8.92E+00	1.07E+00	1.05E+02	9.1E+00	X	T	1975	ICS	0.419	Je75	
28	Ni	8.3328	9.00E+00	1.08E+00	8.00E+01	8.0E+00	X	TS	1996	ICS		Lu96	
28	Ni	8.3328	9.00E+00	1.08E+00	5.70E+01	6.0E+00	X	TS	1997	ICS		He97	
28	Ni	8.3328	9.00E+00	1.08E+00	7.70E+01	7.7E+00	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	9.30E+00	1.12E+00	1.15E+02	1.2E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	9.30E+00	1.12E+00	9.78E+01	1.3E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	9.50E+00	1.14E+00	1.34E+02	1.3E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	9.70E+00	1.16E+00	1.56E+02	1.6E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	9.83E+00	1.18E+00	1.93E+02	1.6E+01	X	T	1975	ICS	0.419	Je75	§
28	Ni	8.3328	1.00E+01	1.20E+00	1.05E+02	1.2E+01	X	TS	1996	ICS		Lu96	
28	Ni	8.3328	1.00E+01	1.20E+00	7.40E+01	8.0E+00	X	TS	1997	ICS		He97	
28	Ni	8.3328	1.00E+01	1.20E+00	1.81E+02	1.8E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	1.05E+01	1.26E+00	2.20E+02	2.2E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	1.05E+01	1.26E+00	2.36E+02	3.1E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	1.09E+01	1.31E+00	3.01E+02	2.4E+01	X	S	2006	ICS	0.401	An06	
28	Ni	8.3328	1.10E+01	1.32E+00	2.62E+02	2.6E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	1.15E+01	1.38E+00	2.84E+02	2.8E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	1.18E+01	1.42E+00	2.75E+02	3.6E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	1.20E+01	1.44E+00	3.50E+02	4.5E+01	X	TS	1996	ICS		Lu96	
28	Ni	8.3328	1.20E+01	1.44E+00	2.47E+02	3.0E+01	X	TS	1997	ICS		He97	
28	Ni	8.3328	1.20E+01	1.44E+00	3.13E+02	3.1E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	1.20E+01	1.44E+00	3.37E+02	2.8E+01	X	S	2006	ICS	0.401	An06	
28	Ni	8.3328	1.23E+01	1.48E+00	3.51E+02	2.8E+01	X	T	1975	ICS	0.419	Je75	§
28	Ni	8.3328	1.30E+01	1.56E+00	3.57E+02	3.6E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	1.30E+01	1.56E+00	3.66E+02	3.4E+01	X	S	2006	ICS	0.401	An06	
28	Ni	8.3328	1.30E+01	1.56E+00	3.20E+02	4.2E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	1.40E+01	1.68E+00	3.96E+02	4.0E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	1.40E+01	1.68E+00	3.92E+02	3.6E+01	X	S	2006	ICS	0.401	An06	
28	Ni	8.3328	1.43E+01	1.72E+00	3.52E+02	4.6E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	1.47E+01	1.77E+00	4.46E+02	3.3E+01	X	T	1975	ICS	0.419	Je75	§
28	Ni	8.3328	1.48E+01	1.78E+00	3.40E+02	3.4E+01	X	T	1947	ICS		Po47	
28	Ni	8.3328	1.50E+01	1.80E+00	4.27E+02	4.3E+01	X	T	2000	ICS	0.412	Ll00	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
28	Ni	8.3328	1.50E+01	1.80E+00	4.14E+02	3.3E+01	X	S	2006	ICS	0.401	An06	
28	Ni	8.3328	1.56E+01	1.87E+00	4.13E+02	5.4E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	1.60E+01	1.92E+00	4.80E+02	5.4E+01	X	TS	1996	ICS		Lu96	
28	Ni	8.3328	1.60E+01	1.92E+00	3.39E+02	3.4E+01	X	TS	1997	ICS		He97	
28	Ni	8.3328	1.60E+01	1.92E+00	4.52E+02	4.5E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	1.69E+01	2.03E+00	4.52E+02	3.6E+01	X	S	2006	ICS	0.401	An06	
28	Ni	8.3328	1.69E+01	2.03E+00	4.27E+02	5.6E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	1.70E+01	2.04E+00	4.72E+02	4.7E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	1.80E+01	2.16E+00	4.82E+02	4.8E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	1.81E+01	2.17E+00	4.48E+02	5.8E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	1.90E+01	2.28E+00	4.97E+02	5.0E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	1.90E+01	2.28E+00	4.81E+02	3.7E+01	X	S	2006	ICS	0.401	An06	
28	Ni	8.3328	1.93E+01	2.32E+00	4.40E+02	5.7E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	1.97E+01	2.36E+00	5.28E+02	3.3E+01	X	T	1975	ICS	0.419	Je75	§
28	Ni	8.3328	2.00E+01	2.40E+00	5.12E+02	6.0E+01	X	TS	1996	ICS		Lu96	
28	Ni	8.3328	2.00E+01	2.40E+00	3.62E+02	3.5E+01	X	TS	1997	ICS		He97	
28	Ni	8.3328	2.00E+01	2.40E+00	5.04E+02	5.0E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	2.06E+01	2.47E+00	4.57E+02	5.9E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	2.10E+01	2.52E+00	5.07E+02	5.1E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	2.10E+01	2.52E+00	5.02E+02	3.9E+01	X	S	2006	ICS	0.401	An06	
28	Ni	8.3328	2.19E+01	2.63E+00	4.72E+02	6.1E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	2.20E+01	2.64E+00	5.11E+02	5.1E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	2.30E+01	2.76E+00	5.23E+02	5.2E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	2.30E+01	2.76E+00	5.18E+02	3.9E+01	X	S	2006	ICS	0.401	An06	
28	Ni	8.3328	2.32E+01	2.78E+00	4.59E+02	6.0E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	2.40E+01	2.88E+00	5.20E+02	5.2E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	2.44E+01	2.93E+00	4.89E+02	6.4E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	2.47E+01	2.96E+00	5.52E+02	2.8E+01	X	T	1975	ICS	0.419	Je75	
28	Ni	8.3328	2.48E+01	2.98E+00	4.18E+02	4.2E+01	X	T	1947	ICS		Po47	
28	Ni	8.3328	2.50E+01	3.00E+00	5.47E+02	7.5E+01	X	TS	1996	ICS		Lu96	
28	Ni	8.3328	2.50E+01	3.00E+00	3.87E+02	4.3E+01	X	TS	1997	ICS		He97	
28	Ni	8.3328	2.50E+01	3.00E+00	5.32E+02	5.3E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	2.50E+01	3.00E+00	5.32E+02	4.0E+01	X	S	2006	ICS	0.401	An06	
28	Ni	8.3328	2.57E+01	3.08E+00	4.73E+02	6.2E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	2.60E+01	3.12E+00	5.30E+02	5.3E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	2.70E+01	3.24E+00	5.31E+02	5.3E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	2.70E+01	3.24E+00	4.78E+02	6.2E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	2.80E+01	3.36E+00	5.26E+02	5.3E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	2.80E+01	3.36E+00	5.26E+02	5.3E+01	X	S	2006	ICS	0.401	An06	
28	Ni	8.3328	2.82E+01	3.38E+00	5.22E+02	6.8E+01	X	T	2020	ICS	0.401	**Ti20**	
28	Ni	8.3328	2.90E+01	3.48E+00	5.28E+02	5.3E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	2.98E+01	3.58E+00	5.53E+02	2.7E+01	X	T	1975	ICS	0.419	Je75	§
28	Ni	8.3328	3.00E+01	3.60E+00	5.37E+02	7.2E+01	X	TS	1996	ICS		Lu96	
28	Ni	8.3328	3.00E+01	3.60E+00	3.80E+02	3.9E+01	X	TS	1997	ICS		He97	
28	Ni	8.3328	3.00E+01	3.60E+00	5.33E+02	5.3E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	3.10E+01	3.72E+00	5.26E+02	5.3E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	3.20E+01	3.84E+00	5.26E+02	5.3E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	3.30E+01	3.96E+00	5.26E+02	5.3E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	3.40E+01	4.08E+00	5.17E+02	7.3E+01	X	TS	1996	ICS		Lu96	
28	Ni	8.3328	3.40E+01	4.08E+00	3.66E+02	3.9E+01	X	TS	1997	ICS		He97	
28	Ni	8.3328	3.40E+01	4.08E+00	5.28E+02	5.3E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	3.48E+01	4.18E+00	5.40E+02	2.5E+01	X	T	1975	ICS	0.419	Je75	§
28	Ni	8.3328	3.50E+01	4.20E+00	5.26E+02	5.3E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	3.57E+01	4.28E+00	4.11E+02	4.1E+01	X	T	1947	ICS		Po47	
28	Ni	8.3328	3.60E+01	4.32E+00	5.23E+02	5.2E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	3.80E+01	4.56E+00	5.18E+02	5.2E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	3.97E+01	4.77E+00	5.26E+02	2.3E+01	X	T	1975	ICS	0.419	Je75	§
28	Ni	8.3328	4.00E+01	4.80E+00	5.14E+02	5.1E+01	X	T	2000	ICS	0.412	Ll00	
28	Ni	8.3328	4.20E+01	5.04E+00	3.41E+02	5.2E+01	X	TS	1997	ICS		He97	
28	Ni	8.3328	4.47E+01	5.37E+00	5.12E+02	2.2E+01	X	T	1975	ICS	0.419	Je75	
28	Ni	8.3328	4.60E+01	5.52E+00	3.08E+02	5.8E+01	X	TS	1997	ICS		He97	
28	Ni	8.3328	4.62E+01	5.54E+00	3.90E+02	3.9E+01	X	T	1947	ICS		Po47	
28	Ni	8.3328	4.97E+01	5.97E+00	4.90E+02	2.1E+01	X	T	1975	ICS	0.419	Je75	§
28	Ni	8.3328	5.56E+01	6.67E+00	3.62E+02	3.6E+01	X	T	1947	ICS		Po47	
28	Ni	8.3328	7.00E+01	8.40E+00	3.38E+02	2.0E+01	X	T	1945	ICS	0.385	Sm45	
28	Ni	8.3328	7.53E+01	9.04E+00	3.20E+02	3.2E+01	X	T	1947	ICS		Po47	
28	Ni	8.3328	9.51E+01	1.14E+01	2.96E+02	3.0E+01	X	T	1947	ICS		Po47	
28	Ni	8.3328	1.25E+02	1.49E+01	2.62E+02	2.6E+01	X	T	1947	ICS		Po47	
28	Ni	8.3328	1.53E+02	1.84E+01	2.40E+02	2.4E+01	X	T	1947	ICS		Po47	
28	Ni	8.3328	1.83E+02	2.20E+01	2.22E+02	2.2E+01	X	T	1947	ICS		Po47	
28	Ni	8.3328	4.90E+02	5.88E+01	3.37E+02	8.4E+01	X	T	1974	ICS	0.414	Se74	
28	Ni	8.3328	6.70E+02	8.04E+01	3.45E+02	8.6E+01	X	T	1974	ICS	0.414	Se74	
28	Ni	8.3328	2.04E+03	2.45E+02	2.34E+02	2.7E+01	X	T	1972	ICS	0.414	**Sc72**	¶
28	Ni	8.3328	2.90E+03	3.48E+02	1.45E+02	1.1E+01	X	T	1975	ICS		**Da75**	⋆

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
28	Ni	8.3328	4.50E+03	5.40E+02	1.56E+02	1.2E+01	X	T	1975	ICS		**Da75**	⋆
28	Ni	8.3328	6.40E+03	7.68E+02	1.57E+02	1.8E+01	X	T	1975	ICS		**Da75**	⋆
28	Ni	8.3328	7.60E+03	9.12E+02	1.65E+02	1.3E+01	X	T	1975	ICS		**Da75**	⋆
28	Ni	8.3328	8.00E+03	9.60E+02	1.75E+02	2.3E+01	X	T	1975	ICS		**Da75**	⋆
28	Ni	8.3328	8.50E+03	1.02E+03	1.65E+02	9.0E+00	X	T	1975	ICS		**Da75**	⋆
28	Ni	8.3328	1.15E+04	1.38E+03	1.75E+02	1.2E+01	X	T	1975	ICS		**Da75**	⋆
28	Ni	8.3328	1.29E+04	1.55E+03	1.86E+02	2.1E+01	X	T	1975	ICS		**Da75**	⋆
28	Ni	8.3328	1.47E+04	1.76E+03	1.82E+02	1.6E+01	X	T	1975	ICS		**Da75**	⋆
28	Ni	8.3328	2.00E+04	2.40E+03	2.78E+02	2.2E+01	X	T	1979	ICS	0.414	Ho79	
28	Ni	8.3328	2.01E+04	2.41E+03	2.14E+02	2.2E+01	X	T	1975	ICS		**Da75**	⋆
28	Ni	8.3328	2.11E+04	2.53E+03	1.88E+02	1.5E+01	X	T	1975	ICS		**Da75**	⋆
28	Ni	8.3328	5.00E+04	6.00E+03	3.30E+02	2.6E+01	X	T	1979	ICS	0.414	Ho79	
28	Ni	8.3328	6.00E+04	7.20E+03	3.67E+02	2.9E+01	X	T	1979	ICS	0.414	Ho79	
28	Ni	8.3328	9.00E+05	1.08E+05	4.92E+02	3.9E+01	X	T	1982	ICS	0.414	Ge82	
28	Ni	8.3328	1.50E+06	1.80E+05	5.96E+02	4.8E+01	X	T	1982	ICS	0.414	Ge82	
28	Ni	8.3328	2.00E+06	2.40E+05	6.20E+02	5.0E+01	X	T	1982	ICS	0.414	Ge82	
29	Cu	8.9789	9.00E+00	1.00E+00	1.00E+01	1.0E+00	X	TS	1997	ICS		He97	
29	Cu	8.9789	9.12E+00	1.02E+00	1.61E+01	3.6E+00	X	T	1981	ICS	0.44	Sh81	
29	Cu	8.9789	9.27E+00	1.03E+00	1.10E+01	2.0E+00	X	T	1980	ICS	0.44	Sh80	
29	Cu	8.9789	9.40E+00	1.05E+00	2.00E+01	2.0E+00	X	TS	1996	ICS	0.445	An96	
29	Cu	8.9789	9.50E+00	1.06E+00	3.30E+01	6.0E+00	X	T	1980	ICS	0.44	Sh80	
29	Cu	8.9789	9.50E+00	1.06E+00	2.00E+01	2.0E+00	X	TS	1997	ICS		He97	
29	Cu	8.9789	9.50E+00	1.06E+00	5.20E+01	5.2E+00	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	1.00E+01	1.11E+00	6.80E+01	1.1E+01	X	T	1980	ICS	0.44	Sh80	
29	Cu	8.9789	1.00E+01	1.11E+00	8.70E+01	1.7E+01	X	T	1981	ICS	0.44	Sh81	
29	Cu	8.9789	1.00E+01	1.11E+00	1.02E+02	1.0E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	1.00E+01	1.11E+00	8.08E+01	8.6E+00	X	TS	2001	ICS		Zh01	
29	Cu	8.9789	1.05E+01	1.17E+00	5.00E+01	5.0E+00	X	TS	1997	ICS		He97	
29	Cu	8.9789	1.05E+01	1.17E+00	1.44E+02	1.4E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	1.10E+01	1.23E+00	1.21E+02	1.8E+01	X	T	1980	ICS	0.44	Sh80	
29	Cu	8.9789	1.10E+01	1.23E+00	1.82E+02	1.8E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	1.16E+01	1.29E+00	1.55E+02	1.8E+01	X	TS	1996	ICS	0.445	An96	
29	Cu	8.9789	1.20E+01	1.34E+00	1.88E+02	2.1E+01	X	T	1980	ICS	0.44	Sh80	
29	Cu	8.9789	1.20E+01	1.34E+00	1.51E+02	1.1E+01	X	TS	1997	ICS		He97	
29	Cu	8.9789	1.20E+01	1.34E+00	2.44E+02	2.4E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	1.20E+01	1.34E+00	2.31E+02	2.6E+01	X	TS	2001	ICS		Zh01	
29	Cu	8.9789	1.30E+01	1.45E+00	2.94E+02	2.9E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	1.36E+01	1.51E+00	2.57E+02	2.9E+01	X	TS	1996	ICS	0.445	An96	
29	Cu	8.9789	1.40E+01	1.56E+00	3.32E+02	3.3E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	1.40E+01	1.56E+00	3.01E+02	3.5E+01	X	TS	2001	ICS		Zh01	
29	Cu	8.9789	1.50E+01	1.67E+00	2.97E+02	3.1E+01	X	T	1980	ICS	0.44	Sh80	
29	Cu	8.9789	1.50E+01	1.67E+00	2.97E+02	3.6E+01	X	T	1981	ICS	0.44	Sh81	
29	Cu	8.9789	1.50E+01	1.67E+00	2.91E+02	2.1E+01	X	TS	1997	ICS		He97	
29	Cu	8.9789	1.50E+01	1.67E+00	3.62E+02	3.6E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	1.54E+01	1.72E+00	3.03E+02	3.4E+01	X	TS	1996	ICS	0.445	An96	
29	Cu	8.9789	1.60E+01	1.78E+00	3.82E+02	3.8E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	1.60E+01	1.78E+00	3.46E+02	4.0E+01	X	TS	2001	ICS		Zh01	
29	Cu	8.9789	1.70E+01	1.89E+00	4.05E+02	4.1E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	1.75E+01	1.95E+00	3.39E+02	2.5E+01	X	TS	1997	ICS		He97	
29	Cu	8.9789	1.77E+01	1.97E+00	3.75E+02	4.1E+01	X	TS	1996	ICS	0.445	An96	
29	Cu	8.9789	1.80E+01	2.00E+00	4.20E+02	4.2E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	1.80E+01	2.00E+00	3.72E+02	4.3E+01	X	TS	2001	ICS		Zh01	
29	Cu	8.9789	1.90E+01	2.12E+00	4.38E+02	4.4E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	1.97E+01	2.19E+00	3.81E+02	4.2E+01	X	TS	1996	ICS	0.445	An96	
29	Cu	8.9789	2.00E+01	2.23E+00	4.07E+02	4.0E+01	X	T	1980	ICS	0.44	Sh80	
29	Cu	8.9789	2.00E+01	2.23E+00	3.84E+02	4.1E+01	X	T	1981	ICS	0.44	Sh81	
29	Cu	8.9789	2.00E+01	2.23E+00	3.73E+02	2.7E+01	X	TS	1997	ICS		He97	
29	Cu	8.9789	2.00E+01	2.23E+00	4.48E+02	4.5E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	2.00E+01	2.23E+00	3.94E+02	4.6E+01	X	TS	2001	ICS		Zh01	
29	Cu	8.9789	2.10E+01	2.34E+00	4.53E+02	4.5E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	2.17E+01	2.42E+00	4.12E+02	4.4E+01	X	TS	1996	ICS	0.445	An96	
29	Cu	8.9789	2.20E+01	2.45E+00	4.60E+02	4.6E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	2.20E+01	2.45E+00	4.10E+02	5.5E+01	X	TS	2001	ICS		Zh01	
29	Cu	8.9789	2.25E+01	2.51E+00	3.95E+02	2.8E+01	X	TS	1997	ICS		He97	
29	Cu	8.9789	2.30E+01	2.56E+00	4.65E+02	4.7E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	2.39E+01	2.66E+00	3.98E+02	4.8E+01	X	TS	1996	ICS	0.445	An96	
29	Cu	8.9789	2.40E+01	2.67E+00	4.74E+02	4.7E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	2.40E+01	2.67E+00	4.15E+02	5.7E+01	X	TS	2001	ICS		Zh01	
29	Cu	8.9789	2.50E+01	2.78E+00	4.50E+02	7.0E+00	X	T	1972	ICS	0.545	Da72	
29	Cu	8.9789	2.50E+01	2.78E+00	4.20E+02	4.0E+01	X	T	1980	ICS	0.44	Sh80	
29	Cu	8.9789	2.50E+01	2.78E+00	4.01E+02	4.5E+01	X	T	1981	ICS	0.44	Sh81	
29	Cu	8.9789	2.50E+01	2.78E+00	4.10E+02	3.0E+01	X	TS	1997	ICS		He97	
29	Cu	8.9789	2.50E+01	2.78E+00	4.87E+02	4.9E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	2.59E+01	2.88E+00	3.97E+02	4.3E+01	X	TS	1996	ICS	0.445	An96	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
29	Cu	8.9789	2.60E+01	2.90E+00	4.84E+02	4.8E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	2.60E+01	2.90E+00	4.15E+02	5.1E+01	X	TS	2001	ICS		Zh01	
29	Cu	8.9789	2.70E+01	3.01E+00	4.93E+02	4.9E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	2.80E+01	3.12E+00	4.06E+02	2.8E+01	X	TS	1997	ICS		He97	
29	Cu	8.9789	2.80E+01	3.12E+00	4.93E+02	4.9E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	2.90E+01	3.23E+00	4.88E+02	4.9E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	3.00E+01	3.34E+00	4.77E+02	6.0E+00	X	T	1972	ICS	0.545	Da72	
29	Cu	8.9789	3.00E+01	3.34E+00	4.94E+02	4.9E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	3.10E+01	3.45E+00	4.92E+02	4.9E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	3.20E+01	3.56E+00	4.91E+02	4.9E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	3.30E+01	3.68E+00	4.90E+02	4.9E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	3.40E+01	3.79E+00	4.84E+02	4.8E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	3.50E+01	3.90E+00	4.84E+02	4.8E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	3.60E+01	4.01E+00	4.86E+02	4.9E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	3.70E+01	4.12E+00	4.79E+02	4.8E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	3.80E+01	4.23E+00	4.83E+02	4.8E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	4.00E+01	4.45E+00	4.45E+02	4.0E+00	X	T	1972	ICS	0.545	Da72	
29	Cu	8.9789	4.00E+01	4.45E+00	4.82E+02	4.8E+01	X	T	2000	ICS	0.441	Ll00	
29	Cu	8.9789	5.00E+01	5.57E+00	3.97E+02	1.0E+02	X	T	1967	ICS	0.407	Fi67	⋆
29	Cu	8.9789	6.00E+01	6.68E+00	4.28E+02	1.3E+01	X	T	1972	ICS	0.545	Da72	
29	Cu	8.9789	8.00E+01	8.91E+00	3.91E+02	3.0E+00	X	T	1972	ICS	0.545	Da72	
29	Cu	8.9789	8.10E+01	9.02E+00	2.69E+02	2.7E+01	X	T	1972	ICS		Hu72	
29	Cu	8.9789	1.00E+02	1.11E+01	3.25E+02	4.0E+00	X	T	1972	ICS	0.545	Da72	
29	Cu	8.9789	1.00E+02	1.11E+01	1.92E+02	2.9E+01	X	T	1987	ICS	0.443	**We87b**	⋆
29	Cu	8.9789	1.00E+02	1.11E+01	1.76E+02	2.6E+01	X	T	1987	ICS	0.443	**We87b**	⋆
29	Cu	8.9789	1.14E+02	1.27E+01	2.49E+02	2.5E+01	X	T	1972	ICS		Hu72	
29	Cu	8.9789	1.35E+02	1.50E+01	2.99E+02	2.0E+00	X	T	1972	ICS	0.545	Da72	
29	Cu	8.9789	1.52E+02	1.69E+01	2.19E+02	1.8E+01	X	T	1972	ICS		Hu72	
29	Cu	8.9789	3.00E+02	3.34E+01	2.21E+02	2.0E+01	X	T	1978	ICS		Be78	
29	Cu	8.9789	4.00E+02	4.45E+01	2.03E+02	1.8E+01	X	T	1978	ICS		Be78	
29	Cu	8.9789	5.00E+02	5.57E+01	1.96E+02	1.8E+01	X	T	1978	ICS		Be78	
29	Cu	8.9789	6.00E+02	6.68E+01	1.91E+02	1.7E+01	X	T	1978	ICS		Be78	
29	Cu	8.9789	2.04E+03	2.27E+02	1.98E+02	1.9E+01	X	T	1972	ICS	0.445	Sc72	¶
29	Cu	8.9789	4.00E+04	4.45E+03	2.64E+02	1.8E+01	X	T	1979	ICS	0.443	Ho79	
29	Cu	8.9789	1.50E+05	1.67E+04	4.30E+02	6.3E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	1.50E+05	1.67E+04	4.56E+02	6.8E+01	X	T	1977	ICS	0.443	Is77	
29	Cu	8.9789	3.00E+05	3.34E+04	4.66E+02	5.7E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	3.00E+05	3.34E+04	4.64E+02	6.3E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	3.00E+05	3.34E+04	4.86E+02	6.3E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	3.00E+05	3.34E+04	4.37E+02	6.3E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	3.00E+05	3.34E+04	4.36E+02	6.3E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	3.00E+05	3.34E+04	4.36E+02	6.3E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	3.00E+05	3.34E+04	3.25E+02	3.6E+01	X	T	1987	ICS	0.444	**Wa87**	⋆
29	Cu	8.9789	3.50E+05	3.90E+04	3.07E+02	3.2E+01	X	T	1987	ICS	0.444	**Wa87**	⋆
29	Cu	8.9789	5.00E+05	5.57E+04	4.91E+02	7.5E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	5.00E+05	5.57E+04	4.84E+02	7.5E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	5.00E+05	5.57E+04	5.16E+02	6.9E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	5.00E+05	5.57E+04	5.15E+02	6.9E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	7.00E+05	7.80E+04	5.19E+02	7.5E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	7.00E+05	7.80E+04	5.13E+02	6.3E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	9.00E+05	1.00E+05	5.24E+02	7.5E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	9.00E+05	1.00E+05	5.11E+02	7.5E+00	X	T	1970	DICS	0.407	Mi70	
29	Cu	8.9789	9.00E+05	1.00E+05	4.61E+02	3.0E+01	X	T	1982	ICS	0.443	Ge82	
29	Cu	8.9789	1.50E+06	1.67E+05	5.93E+02	4.1E+01	X	T	1982	ICS	0.443	Ge82	
29	Cu	8.9789	2.00E+06	2.23E+05	6.29E+02	4.1E+01	X	T	1982	ICS	0.443	Ge82	
30	Zn	9.6586	1.03E+01	1.06E+00	2.57E+01	3.1E+00	X	TS	1999	ICS	0.479	Ta99a	
30	Zn	9.6586	1.10E+01	1.14E+00	9.10E+01	1.1E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	1.11E+01	1.15E+00	1.47E+02	1.9E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	1.14E+01	1.18E+00	9.46E+01	9.5E+00	X	TS	1999	ICS	0.479	Ta99a	
30	Zn	9.6586	1.20E+01	1.24E+00	1.48E+02	1.8E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	1.23E+01	1.27E+00	1.72E+02	2.2E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	1.26E+01	1.31E+00	1.50E+02	1.5E+01	X	TS	1999	ICS	0.479	Ta99a	
30	Zn	9.6586	1.30E+01	1.35E+00	1.96E+02	2.4E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	1.34E+01	1.39E+00	1.98E+02	2.6E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	1.40E+01	1.45E+00	2.31E+02	2.8E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	1.42E+01	1.47E+00	1.90E+02	2.0E+01	X	TS	1999	ICS	0.479	Ta99a	
30	Zn	9.6586	1.46E+01	1.51E+00	2.29E+02	3.0E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	1.50E+01	1.55E+00	2.49E+02	3.0E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	1.57E+01	1.63E+00	2.35E+02	2.6E+01	X	TS	1999	ICS	0.479	Ta99a	
30	Zn	9.6586	1.58E+01	1.63E+00	2.61E+02	3.4E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	1.60E+01	1.66E+00	2.75E+02	3.3E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	1.69E+01	1.75E+00	3.02E+02	3.9E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	1.70E+01	1.76E+00	3.01E+02	3.6E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	1.77E+01	1.84E+00	2.57E+02	2.8E+01	X	TS	1999	ICS	0.479	Ta99a	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
30	Zn	9.6586	1.80E+01	1.86E+00	3.23E+02	3.9E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	1.81E+01	1.87E+00	2.98E+02	3.9E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	1.90E+01	1.97E+00	3.28E+02	3.9E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	1.93E+01	1.99E+00	3.22E+02	4.2E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	1.99E+01	2.06E+00	2.85E+02	3.3E+01	X	TS	1999	ICS	0.479	Ta99a	
30	Zn	9.6586	2.00E+01	2.07E+00	3.31E+02	4.0E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	2.04E+01	2.11E+00	3.37E+02	4.4E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	2.10E+01	2.17E+00	3.45E+02	4.1E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	2.16E+01	2.23E+00	3.32E+02	4.3E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	2.17E+01	2.25E+00	3.00E+02	3.4E+01	X	TS	1999	ICS	0.479	Ta99a	
30	Zn	9.6586	2.20E+01	2.28E+00	3.51E+02	4.2E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	2.27E+01	2.35E+00	3.37E+02	4.4E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	2.30E+01	2.38E+00	3.46E+02	4.2E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	2.39E+01	2.47E+00	3.16E+02	3.8E+01	X	TS	1999	ICS	0.479	Ta99a	
30	Zn	9.6586	2.39E+01	2.47E+00	3.46E+02	4.5E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	2.40E+01	2.48E+00	3.58E+02	4.3E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	2.50E+01	2.59E+00	3.48E+02	4.2E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	2.51E+01	2.59E+00	3.55E+02	4.6E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	2.57E+01	2.66E+00	3.17E+02	4.0E+01	X	TS	1999	ICS	0.479	Ta99a	
30	Zn	9.6586	2.60E+01	2.69E+00	3.47E+02	4.2E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	2.62E+01	2.72E+00	3.49E+02	4.5E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	2.70E+01	2.80E+00	3.57E+02	4.3E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	2.74E+01	2.83E+00	3.65E+02	4.7E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	2.80E+01	2.90E+00	3.52E+02	4.2E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	2.86E+01	2.96E+00	3.70E+02	4.8E+01	X	T	2020	ICS	0.466	**Ti20**	
30	Zn	9.6586	2.90E+01	3.00E+00	3.57E+02	4.3E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	3.00E+01	3.11E+00	3.49E+02	4.2E+01	X	TS	2010	ICS	0.477	Wu10	
30	Zn	9.6586	2.04E+03	2.11E+02	1.81E+02	1.3E+01	X	T	1972	ICS	0.479	Sc72	¶
30	Zn	9.6586	1.50E+05	1.55E+04	3.96E+02	2.7E+01	X	T	1977	ICS	0.479	Is77	
31	Ga	10.3671	1.05E+01	1.01E+00	1.00E+01	1.2E+00	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	1.10E+01	1.06E+00	3.90E+01	4.7E+00	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	1.15E+01	1.11E+00	7.00E+01	8.4E+00	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	1.20E+01	1.16E+00	1.01E+02	1.5E+01	X	TS	2001	ICS		Zh01	
31	Ga	10.3671	1.20E+01	1.16E+00	1.01E+02	1.5E+01	X	TS	2002	ICS-XRP	0.51	Zh02	
31	Ga	10.3671	1.20E+01	1.16E+00	9.20E+01	1.1E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	1.30E+01	1.25E+00	1.34E+02	1.6E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	1.40E+01	1.35E+00	1.68E+02	2.3E+01	X	TS	2001	ICS		Zh01	
31	Ga	10.3671	1.40E+01	1.35E+00	1.68E+02	2.4E+01	X	TS	2002	ICS-XRP	0.51	Zh02	
31	Ga	10.3671	1.40E+01	1.35E+00	1.66E+02	2.0E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	1.50E+01	1.45E+00	1.93E+02	2.3E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	1.60E+01	1.54E+00	2.21E+02	3.1E+01	X	TS	2001	ICS		Zh01	
31	Ga	10.3671	1.60E+01	1.54E+00	2.21E+02	3.2E+01	X	TS	2002	ICS-XRP	0.51	Zh02	
31	Ga	10.3671	1.60E+01	1.54E+00	2.14E+02	2.6E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	1.70E+01	1.64E+00	2.34E+02	2.8E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	1.80E+01	1.74E+00	2.72E+02	3.7E+01	X	TS	2001	ICS		Zh01	
31	Ga	10.3671	1.80E+01	1.74E+00	2.72E+02	3.7E+01	X	TS	2002	ICS-XRP	0.51	Zh02	
31	Ga	10.3671	1.80E+01	1.74E+00	2.51E+02	3.0E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	1.90E+01	1.83E+00	2.60E+02	3.1E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	2.00E+01	1.93E+00	2.86E+02	3.9E+01	X	TS	2001	ICS		Zh01	
31	Ga	10.3671	2.00E+01	1.93E+00	2.86E+02	3.9E+01	X	TS	2002	ICS-XRP	0.51	Zh02	
31	Ga	10.3671	2.00E+01	1.93E+00	2.76E+02	3.3E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	2.10E+01	2.03E+00	2.81E+02	3.4E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	2.20E+01	2.12E+00	2.95E+02	4.2E+01	X	TS	2001	ICS		Zh01	
31	Ga	10.3671	2.20E+01	2.12E+00	2.95E+02	4.2E+01	X	TS	2002	ICS-XRP	0.51	Zh02	
31	Ga	10.3671	2.20E+01	2.12E+00	2.89E+02	3.5E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	2.30E+01	2.22E+00	2.96E+02	3.6E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	2.40E+01	2.32E+00	3.01E+02	4.5E+01	X	TS	2001	ICS		Zh01	
31	Ga	10.3671	2.40E+01	2.32E+00	3.01E+02	4.5E+01	X	TS	2002	ICS-XRP	0.51	Zh02	
31	Ga	10.3671	2.40E+01	2.32E+00	3.02E+02	3.6E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	2.50E+01	2.41E+00	3.10E+02	3.7E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	2.60E+01	2.51E+00	3.05E+02	4.4E+01	X	TS	2001	ICS		Zh01	
31	Ga	10.3671	2.60E+01	2.51E+00	3.05E+02	4.4E+01	X	TS	2002	ICS-XRP	0.51	Zh02	
31	Ga	10.3671	2.60E+01	2.51E+00	3.09E+02	3.7E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	2.70E+01	2.60E+00	3.16E+02	3.8E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	2.80E+01	2.70E+00	3.03E+02	4.3E+01	X	TS	2002	ICS-XRP	0.51	Zh02	
31	Ga	10.3671	2.80E+01	2.70E+00	3.16E+02	3.8E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	2.90E+01	2.80E+00	3.20E+02	3.8E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	3.00E+01	2.89E+00	3.20E+02	3.8E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	3.10E+01	2.99E+00	3.22E+02	3.9E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	3.20E+01	3.09E+00	3.24E+02	3.9E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	3.30E+01	3.18E+00	3.24E+02	3.9E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	3.40E+01	3.28E+00	3.25E+02	3.9E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	3.50E+01	3.38E+00	3.24E+02	3.9E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	3.60E+01	3.47E+00	3.25E+02	3.9E+01	X	T	2006	ICS	0.496	Me06	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
31	Ga	10.3671	3.70E+01	3.57E+00	3.28E+02	3.9E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	3.80E+01	3.67E+00	3.28E+02	3.9E+01	X	T	2006	ICS	0.496	Me06	
31	Ga	10.3671	3.90E+01	3.76E+00	3.23E+02	3.9E+01	X	T	2006	ICS	0.496	Me06	
32	Ge	11.1031	1.12E+01	1.01E+00	4.80E+00	1.0E+00	X	T	1981	ICS	0.535	Sh81	
32	Ge	11.1031	1.15E+01	1.04E+00	2.20E+01	2.9E+00	X	TS	2002	ICS	0.54	Ta02	
32	Ge	11.1031	1.16E+01	1.05E+00	2.80E+01	2.5E+00	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	1.20E+01	1.08E+00	3.80E+01	6.0E+00	X	T	1981	ICS	0.54	Sh81	
32	Ge	11.1031	1.20E+01	1.08E+00	3.96E+01	4.4E+00	X	TS	2002	ICS-XRP	0.540	Zh02	
32	Ge	11.1031	1.21E+01	1.09E+00	5.10E+01	4.6E+00	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	1.26E+01	1.14E+00	7.00E+01	6.3E+00	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	1.30E+01	1.17E+00	7.99E+01	1.0E+01	X	TS	2002	ICS	0.54	Ta02	
32	Ge	11.1031	1.31E+01	1.18E+00	8.90E+01	8.0E+00	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	1.36E+01	1.23E+00	1.04E+02	9.4E+00	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	1.40E+01	1.26E+00	1.07E+02	1.3E+01	X	TS	2002	ICS-XRP	0.54	Zh02	
32	Ge	11.1031	1.46E+01	1.32E+00	1.31E+02	1.2E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	1.50E+01	1.35E+00	1.39E+02	1.4E+01	X	T	1981	ICS	0.535	Sh81	
32	Ge	11.1031	1.50E+01	1.35E+00	1.31E+02	1.8E+01	X	TS	2002	ICS	0.54	Ta02	
32	Ge	11.1031	1.56E+01	1.41E+00	1.52E+02	1.4E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	1.60E+01	1.44E+00	1.65E+02	1.9E+01	X	TS	2002	ICS-XRP	0.54	Zh02	
32	Ge	11.1031	1.66E+01	1.50E+00	1.70E+02	1.5E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	1.70E+01	1.53E+00	1.85E+02	2.5E+01	X	TS	2002	ICS	0.54	Ta02	
32	Ge	11.1031	1.76E+01	1.59E+00	1.86E+02	1.7E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	1.80E+01	1.62E+00	2.07E+02	2.4E+01	X	TS	2002	ICS-XRP	0.54	Zh02	
32	Ge	11.1031	1.86E+01	1.68E+00	2.01E+02	1.8E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	1.90E+01	1.71E+00	2.11E+02	3.0E+01	X	TS	2002	ICS	0.54	Ta02	
32	Ge	11.1031	1.96E+01	1.77E+00	2.12E+02	1.9E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	2.00E+01	1.80E+00	2.14E+02	2.2E+01	X	T	1981	ICS	0.535	Sh81	
32	Ge	11.1031	2.00E+01	1.80E+00	2.29E+02	2.6E+01	X	TS	2002	ICS-XRP	0.54	Zh02	
32	Ge	11.1031	2.06E+01	1.86E+00	2.22E+02	2.0E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	2.16E+01	1.95E+00	2.30E+02	2.1E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	2.20E+01	1.98E+00	2.38E+02	3.5E+01	X	TS	2002	ICS	0.54	Ta02	
32	Ge	11.1031	2.20E+01	1.98E+00	2.48E+02	2.8E+01	X	TS	2002	ICS-XRP	0.54	Zh02	
32	Ge	11.1031	2.26E+01	2.04E+00	2.37E+02	2.1E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	2.36E+01	2.13E+00	2.44E+02	2.2E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	2.40E+01	2.16E+00	2.58E+02	3.0E+01	X	TS	2002	ICS-XRP	0.54	Zh02	
32	Ge	11.1031	2.46E+01	2.22E+00	2.49E+02	2.2E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	2.50E+01	2.25E+00	2.42E+02	2.4E+01	X	T	1981	ICS	0.535	Sh81	
32	Ge	11.1031	2.50E+01	2.25E+00	2.48E+02	3.8E+01	X	TS	2002	ICS	0.54	Ta02	
32	Ge	11.1031	2.56E+01	2.31E+00	2.54E+02	2.3E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	2.60E+01	2.34E+00	2.62E+02	4.1E+01	X	TS	2002	ICS-XRP	0.54	Zh02	
32	Ge	11.1031	2.66E+01	2.40E+00	2.56E+02	2.3E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	2.76E+01	2.49E+00	2.60E+02	2.3E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	2.80E+01	2.52E+00	2.48E+02	3.9E+01	X	TS	2002	ICS	0.54	Ta02	
32	Ge	11.1031	2.80E+01	2.52E+00	2.60E+02	3.2E+01	X	TS	2002	ICS-XRP	0.54	Zh02	
32	Ge	11.1031	2.86E+01	2.58E+00	2.61E+02	2.3E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	2.96E+01	2.67E+00	2.62E+02	2.4E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	3.00E+01	2.70E+00	2.63E+02	3.4E+01	X	TS	2002	ICS-XRP	0.54	Zh02	
32	Ge	11.1031	3.06E+01	2.76E+00	2.64E+02	2.4E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	3.10E+01	2.79E+00	2.47E+02	4.0E+01	X	TS	2002	ICS	0.54	Ta02	
32	Ge	11.1031	3.16E+01	2.85E+00	2.67E+02	2.4E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	3.26E+01	2.94E+00	2.64E+02	2.4E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	3.36E+01	3.03E+00	2.67E+02	2.4E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	3.40E+01	3.06E+00	2.46E+02	4.1E+01	X	TS	2002	ICS	0.54	Ta02	
32	Ge	11.1031	3.40E+01	3.06E+00	2.56E+02	3.3E+01	X	TS	2002	ICS-XRP	0.54	Zh02	
32	Ge	11.1031	3.46E+01	3.12E+00	2.69E+02	2.4E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	3.56E+01	3.21E+00	2.70E+02	2.4E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	3.66E+01	3.30E+00	2.70E+02	2.4E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	3.70E+01	3.33E+00	2.39E+02	4.3E+01	X	TS	2002	ICS	0.54	Ta02	
32	Ge	11.1031	3.76E+01	3.39E+00	2.71E+02	2.4E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	3.86E+01	3.48E+00	2.71E+02	2.4E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	3.96E+01	3.57E+00	2.72E+02	2.4E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	4.00E+01	3.60E+00	2.32E+02	4.7E+01	X	TS	2002	ICS	0.54	Ta02	
32	Ge	11.1031	4.06E+01	3.66E+00	2.70E+02	2.4E+01	X	T	2004	ICS	0.523	Me04	
32	Ge	11.1031	2.00E+04	1.80E+03	1.94E+02	1.6E+01	X	T	1979	ICS	0.54	Ho79	
32	Ge	11.1031	3.50E+04	3.15E+03	2.10E+02	1.7E+01	X	T	1979	ICS	0.54	Ho79	
32	Ge	11.1031	5.00E+04	4.50E+03	2.18E+02	1.7E+01	X	T	1979	ICS	0.54	Ho79	
32	Ge	11.1031	6.00E+04	5.40E+03	2.24E+02	1.8E+01	X	T	1979	ICS	0.54	Ho79	
33	As	11.8667	1.20E+01	1.01E+00	4.00E+00	4.8E−01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	1.30E+01	1.10E+00	4.90E+01	5.9E+00	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	1.40E+01	1.18E+00	8.30E+01	1.0E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	1.50E+01	1.26E+00	1.09E+02	1.3E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	1.60E+01	1.35E+00	1.31E+02	1.6E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	1.70E+01	1.43E+00	1.51E+02	1.8E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	1.80E+01	1.52E+00	1.68E+02	2.0E+01	X	T	2006	ICS	0.549	Me06	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
33	As	11.8667	1.90E+01	1.60E+00	1.81E+02	2.2E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	2.00E+01	1.69E+00	1.94E+02	2.3E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	2.10E+01	1.77E+00	2.01E+02	2.4E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	2.20E+01	1.85E+00	2.09E+02	2.5E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	2.30E+01	1.94E+00	2.16E+02	2.6E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	2.40E+01	2.02E+00	2.26E+02	2.7E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	2.50E+01	2.11E+00	2.35E+02	2.8E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	2.60E+01	2.19E+00	2.33E+02	2.8E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	2.70E+01	2.28E+00	2.31E+02	2.8E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	2.80E+01	2.36E+00	2.42E+02	2.9E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	2.90E+01	2.44E+00	2.48E+02	3.0E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	3.00E+01	2.53E+00	2.49E+02	3.0E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	3.10E+01	2.61E+00	2.50E+02	3.0E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	3.20E+01	2.70E+00	2.58E+02	3.1E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	3.30E+01	2.78E+00	2.53E+02	3.0E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	3.40E+01	2.87E+00	2.53E+02	3.0E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	3.50E+01	2.95E+00	2.53E+02	3.0E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	3.60E+01	3.03E+00	2.58E+02	3.1E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	3.70E+01	3.12E+00	2.54E+02	3.0E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	3.80E+01	3.20E+00	2.56E+02	3.1E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	3.90E+01	3.29E+00	2.58E+02	3.1E+01	X	T	2006	ICS	0.549	Me06	
33	As	11.8667	2.04E+03	1.72E+02	1.33E+02	1.0E+01	X	T	1972	ICS	0.567	Sc72	¶
34	Se	12.6578	1.30E+01	1.03E+00	1.41E+01	2.0E+00	X	TS	2001	ICS	0.596	Lu01	
34	Se	12.6578	1.50E+01	1.19E+00	6.20E+01	8.3E+00	X	TS	2001	ICS	0.596	Lu01	
34	Se	12.6578	1.70E+01	1.34E+00	1.04E+02	1.4E+01	X	TS	2001	ICS	0.596	Lu01	
34	Se	12.6578	1.90E+01	1.50E+00	1.30E+02	1.9E+01	X	TS	2001	ICS	0.596	Lu01	
34	Se	12.6578	2.00E+01	1.58E+00	1.90E+02	4.7E+01	X	T	1967	ICS	0.585	Fi67	⋆
34	Se	12.6578	2.20E+01	1.74E+00	1.61E+02	2.4E+01	X	TS	2001	ICS	0.596	Lu01	
34	Se	12.6578	2.50E+01	1.98E+00	1.72E+02	2.6E+01	X	TS	2001	ICS	0.596	Lu01	
34	Se	12.6578	2.80E+01	2.21E+00	1.85E+02	2.9E+01	X	TS	2001	ICS	0.596	Lu01	
34	Se	12.6578	3.20E+01	2.53E+00	1.93E+02	3.2E+01	X	TS	2001	ICS	0.596	Lu01	
34	Se	12.6578	3.60E+01	2.84E+00	1.93E+02	3.5E+01	X	TS	2001	ICS	0.596	Lu01	
34	Se	12.6578	4.00E+01	3.16E+00	1.86E+02	3.9E+01	X	TS	2001	ICS	0.596	Lu01	
34	Se	12.6578	6.00E+01	4.74E+00	2.10E+02	1.9E+01	X	T	1981	ICS	0.589	Ki81	
34	Se	12.6578	1.00E+02	7.90E+00	1.83E+02	1.7E+01	X	T	1981	ICS	0.589	Ki81	
34	Se	12.6578	2.00E+02	1.58E+01	1.48E+02	1.3E+01	X	T	1981	ICS	0.589	Ki81	
34	Se	12.6578	3.00E+02	2.37E+01	1.48E+02	1.3E+01	X	T	1978	ICS		Be78	
34	Se	12.6578	3.00E+02	2.37E+01	1.32E+02	1.2E+01	X	T	1981	ICS	0.589	Ki81	
34	Se	12.6578	4.00E+02	3.16E+01	1.38E+02	1.2E+01	X	T	1978	ICS		Be78	
34	Se	12.6578	4.00E+02	3.16E+01	1.26E+02	1.1E+01	X	T	1981	ICS	0.589	Ki81	
34	Se	12.6578	5.00E+02	3.95E+01	1.33E+02	1.2E+01	X	T	1978	ICS		Be78	
34	Se	12.6578	5.00E+02	3.95E+01	1.22E+02	1.1E+01	X	T	1981	ICS	0.589	Ki81	
34	Se	12.6578	6.00E+02	4.74E+01	1.30E+02	1.2E+01	X	T	1978	ICS		Be78	
34	Se	12.6578	6.00E+02	4.74E+01	1.19E+02	1.1E+01	X	T	1981	ICS	0.589	Ki81	
34	Se	12.6578	2.04E+03	1.61E+02	1.12E+02	7.5E+00	X	T	1972	ICS	0.596	Sc72	¶
34	Se	12.6578	7.00E+04	5.53E+03	2.69E+02	4.0E+01	X	T	1977	ICS	0.596	Is77	
34	Se	12.6578	1.50E+05	1.19E+04	2.74E+02	4.1E+01	X	T	1977	ICS	0.596	Is77	
35	Br	13.4737	2.04E+03	1.51E+02	117.0	9.0	X	T	1972	ICS	0.622	Sc72	¶
36	Kr	14.3256	2.00E+04	1.40E+03	1.47E+02	6.0E+00	X	T	1979	ICS	0.646	Ho79	
36	Kr	14.3256	3.00E+04	2.09E+03	1.54E+02	6.0E+00	X	T	1979	ICS	0.646	Ho79	
36	Kr	14.3256	4.00E+04	2.79E+03	1.60E+02	6.0E+00	X	T	1979	ICS	0.646	Ho79	
36	Kr	14.3256	5.00E+04	3.49E+03	1.68E+02	7.0E+00	X	T	1979	ICS	0.646	Ho79	
36	Kr	14.3256	6.00E+04	4.19E+03	1.73E+02	7.0E+00	X	T	1979	ICS	0.646	Ho79	
37	Rb	15.1997	1.60E+01	1.05E+00	2.27E+01	3.4E+00	X	G	1991	ICS	0.667	Sh91	
37	Rb	15.1997	1.70E+01	1.12E+00	4.33E+01	6.5E+00	X	G	1991	ICS	0.667	Sh91	
37	Rb	15.1997	1.80E+01	1.18E+00	5.47E+01	8.2E+00	X	G	1991	ICS	0.667	Sh91	
37	Rb	15.1997	1.90E+01	1.25E+00	7.14E+01	1.1E+01	X	G	1991	ICS	0.667	Sh91	
37	Rb	15.1997	2.00E+01	1.32E+00	7.71E+01	1.2E+01	X	G	1991	ICS	0.667	Sh91	
37	Rb	15.1997	2.25E+01	1.48E+00	8.00E+01	1.2E+01	X	G	1991	ICS	0.667	Sh91	
37	Rb	15.1997	2.50E+01	1.64E+00	8.76E+01	1.3E+01	X	G	1991	ICS	0.667	Sh91	
37	Rb	15.1997	3.00E+01	1.97E+00	9.66E+01	1.4E+01	X	G	1991	ICS	0.667	Sh91	
37	Rb	15.1997	3.50E+01	2.30E+00	1.01E+02	1.5E+01	X	G	1991	ICS	0.667	Sh91	
37	Rb	15.1997	4.00E+01	2.63E+00	1.10E+02	1.7E+01	X	G	1991	ICS	0.667	Sh91	
37	Rb	15.1997	4.50E+01	2.96E+00	1.23E+02	1.8E+01	X	G	1991	ICS	0.667	Sh91	
37	Rb	15.1997	2.04E+03	1.34E+02	1.01E+02	3.8E+00	X	T	1972	ICS	0.669	Sc72	¶
38	Sr	16.1046	1.70E+01	1.06E+00	1.60E+01	2.4E+00	X	G	1991	ICS	0.69	Sh91	
38	Sr	16.1046	1.80E+01	1.12E+00	2.01E+01	3.0E+00	X	G	1991	ICS	0.69	Sh91	
38	Sr	16.1046	1.90E+01	1.18E+00	2.99E+01	4.5E+00	X	G	1991	ICS	0.69	Sh91	
38	Sr	16.1046	2.00E+01	1.24E+00	4.59E+01	6.9E+00	X	G	1991	ICS	0.69	Sh91	
38	Sr	16.1046	2.50E+01	1.55E+00	7.05E+01	1.1E+01	X	G	1991	ICS	0.69	Sh91	
38	Sr	16.1046	3.00E+01	1.86E+00	7.96E+01	1.2E+01	X	G	1991	ICS	0.69	Sh91	
38	Sr	16.1046	3.50E+01	2.17E+00	8.61E+01	1.3E+01	X	G	1991	ICS	0.69	Sh91	
38	Sr	16.1046	4.00E+01	2.48E+00	8.91E+01	1.3E+01	X	G	1991	ICS	0.69	Sh91	
38	Sr	16.1046	4.50E+01	2.79E+00	9.95E+01	1.5E+01	X	G	1991	ICS	0.69	Sh91	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
38	Sr	16.1046	2.04E+03	1.27E+02	8.97E+01	4.7E+00	X	T	1972	ICS	0.691	Sc72	¶
38	Sr	16.1046	1.50E+05	9.31E+03	2.04E+02	3.8E+00	X	T	1970	DICS		Mi70	
38	Sr	16.1046	3.00E+05	1.86E+04	2.12E+02	2.5E+00	X	T	1970	DICS		Mi70	
38	Sr	16.1046	5.00E+05	3.10E+04	2.36E+02	3.8E+00	X	T	1970	DICS		Mi70	
38	Sr	16.1046	5.00E+05	3.10E+04	2.27E+02	3.8E+00	X	T	1970	DICS		Mi70	
38	Sr	16.1046	5.00E+05	3.10E+04	2.30E+02	3.8E+00	X	T	1970	DICS		Mi70	
38	Sr	16.1046	7.00E+05	4.35E+04	2.48E+02	3.8E+00	X	T	1970	DICS		Mi70	
38	Sr	16.1046	9.00E+05	5.59E+04	2.51E+02	3.8E+00	X	T	1970	DICS		Mi70	
39	Y	17.0384	1.80E+01	1.06E+00	1.54E+01	2.6E+00	X	TS	2001	ICS	0.711	Lu01	
39	Y	17.0384	2.00E+01	1.17E+00	4.19E+01	6.0E+00	X	TS	2001	ICS	0.711	Lu01	
39	Y	17.0384	2.30E+01	1.35E+00	7.23E+01	1.1E+01	X	TS	2001	ICS	0.711	Lu01	
39	Y	17.0384	2.60E+01	1.53E+00	8.71E+01	1.3E+01	X	TS	2001	ICS	0.711	Lu01	
39	Y	17.0384	2.90E+01	1.70E+00	1.02E+02	1.6E+01	X	TS	2001	ICS	0.711	Lu01	
39	Y	17.0384	3.20E+01	1.88E+00	1.12E+02	1.9E+01	X	TS	2001	ICS	0.711	Lu01	
39	Y	17.0384	1.00E+02	5.87E+00	7.49E+01	1.1E+01	X	T	1987	ICS	0.711	**We87b**	⋆
39	Y	17.0384	1.00E+02	5.87E+00	8.46E+01	1.3E+01	X	T	1987	ICS	0.711	**We87b**	⋆
39	Y	17.0384	4.90E+02	2.88E+01	7.30E+01	1.8E+01	X	T	1974	ICS	0.711	Se74	⋆
39	Y	17.0384	6.70E+02	3.93E+01	7.60E+01	1.9E+01	X	T	1974	ICS	0.711	Se74	⋆
39	Y	17.0384	5.00E+04	2.93E+03	1.38E+02	1.4E+01	X	T	1979	ICS	0.711	Ho79	
39	Y	17.0384	7.00E+04	4.11E+03	1.89E+02	2.8E+01	X	T	1977	ICS	0.711	Is77	
39	Y	17.0384	1.50E+05	8.80E+03	1.87E+02	2.8E+01	X	T	1977	ICS	0.711	Is77	
39	Y	17.0384	2.70E+05	1.58E+04	2.05E+02	3.1E+01	X	T	1977	ICS	0.711	Is77	
39	Y	17.0384	3.00E+05	1.76E+04	1.87E+02	1.1E+01	X	TS	1987	ICS	0.711	**Wa87**	⋆
39	Y	17.0384	3.50E+05	2.05E+04	1.91E+02	1.0E+01	X	TS	1987	ICS	0.711	**Wa87**	⋆
39	Y	17.0384	3.80E+05	2.23E+04	1.63E+02	9.0E+00	X	TS	1987	ICS	0.711	**Wa87**	⋆
40	Zr	17.9976	1.80E+01	1.00E+00	1.11E+01	2.2E+00	X	TS	2002	ICS-XRP	0.73	Zh02	
40	Zr	17.9976	2.00E+01	1.11E+00	2.61E+01	4.1E+00	X	TS	2002	ICS-XRP	0.73	Zh02	
40	Zr	17.9976	2.00E+01	1.11E+00	2.38E+01	3.1E+00	X	TS	2020	ICS		**Li20**	
40	Zr	17.9976	2.20E+01	1.22E+00	4.98E+01	8.0E+00	X	TS	2002	ICS-XRP	0.73	Zh02	
40	Zr	17.9976	2.20E+01	1.22E+00	4.19E+01	2.9E+00	X	TS	2020	ICS		**Li20**	
40	Zr	17.9976	2.40E+01	1.33E+00	5.74E+01	9.4E+00	X	TS	2002	ICS-XRP	0.73	Zh02	
40	Zr	17.9976	2.50E+01	1.39E+00	6.17E+01	4.3E+00	X	TS	2020	ICS		**Li20**	
40	Zr	17.9976	2.60E+01	1.44E+00	7.09E+01	1.2E+00	X	TS	2002	ICS-XRP	0.73	Zh02	
40	Zr	17.9976	2.70E+01	1.50E+00	7.13E+01	5.0E+00	X	TS	2020	ICS		**Li20**	
40	Zr	17.9976	2.80E+01	1.56E+00	7.88E+01	1.3E+00	X	TS	2002	ICS-XRP	0.73	Zh02	
40	Zr	17.9976	3.00E+01	1.67E+00	8.95E+01	1.5E+00	X	TS	2002	ICS-XRP	0.73	Zh02	
40	Zr	17.9976	3.40E+01	1.89E+00	1.02E+02	1.8E+00	X	TS	2002	ICS-XRP	0.73	Zh02	
40	Zr	17.9976	2.40E+02	1.33E+01	9.00E+01	5.0E+00	X	T	1964	ICS		Ha64	
40	Zr	17.9976	5.30E+02	2.94E+01	1.15E+02	8.0E+00	X	T	1964	ICS		Ha64	
40	Zr	17.9976	8.20E+02	4.56E+01	1.25E+02	9.0E+00	X	T	1964	ICS		Ha64	
40	Zr	17.9976	1.13E+03	6.28E+01	1.15E+02	9.0E+00	X	T	1964	ICS		Ha64	
40	Zr	17.9976	1.44E+03	8.00E+01	9.90E+01	1.0E+01	X	T	1964	ICS		Ha64	
41	Nb	18.9856	2.00E+01	1.05E+00	1.06E+01	1.4E+00	X	TS	1998	ICS	0.748	Pe98	
41	Nb	18.9856	2.20E+01	1.16E+00	1.91E+01	2.0E+00	X	TS	1998	ICS	0.748	Pe98	
41	Nb	18.9856	2.40E+01	1.26E+00	2.41E+01	2.4E+00	X	TS	1998	ICS	0.748	Pe98	
41	Nb	18.9856	2.60E+01	1.37E+00	3.14E+01	2.9E+00	X	TS	1998	ICS	0.748	Pe98	
41	Nb	18.9856	2.80E+01	1.47E+00	4.20E+01	4.7E+00	X	TS	1998	ICS	0.748	Pe98	
41	Nb	18.9856	3.00E+01	1.58E+00	5.31E+01	5.8E+00	X	TS	1998	ICS	0.748	Pe98	
41	Nb	18.9856	3.20E+01	1.69E+00	5.85E+01	7.7E+00	X	TS	1998	ICS	0.748	Pe98	
41	Nb	18.9856	3.40E+01	1.79E+00	6.53E+01	8.8E+00	X	TS	1998	ICS	0.748	Pe98	
42	Mo	19.9995	2.10E+01	1.05E+00	1.55E+01	1.4E+00	X	TS	1996	ICS		He96b	
42	Mo	19.9995	2.20E+01	1.10E+00	2.78E+01	2.7E+00	X	TS	1996	ICS		He96b	
42	Mo	19.9995	2.40E+01	1.20E+00	3.79E+01	3.4E+00	X	TS	1996	ICS		He96b	
42	Mo	19.9995	2.60E+01	1.30E+00	4.98E+01	4.1E+00	X	TS	1996	ICS		He96b	
42	Mo	19.9995	2.80E+01	1.40E+00	6.09E+01	5.2E+00	X	TS	1996	ICS		He96b	
42	Mo	19.9995	3.00E+01	1.50E+00	7.07E+01	6.6E+00	X	TS	1996	ICS		He96b	
42	Mo	19.9995	3.20E+01	1.60E+00	7.67E+01	8.1E+00	X	TS	1996	ICS		He96b	
42	Mo	19.9995	3.40E+01	1.70E+00	8.70E+01	8.6E+00	X	TS	1996	ICS		He96b	
42	Mo	19.9995	3.60E+01	1.80E+00	9.43E+01	1.0E+01	X	TS	1996	ICS		He96b	
42	Mo	19.9995	3.80E+01	1.90E+00	1.07E+02	1.2E+01	X	TS	1996	ICS		He96b	
42	Mo	19.9995	4.00E+01	2.00E+00	1.30E+02	1.7E+01	X	TS	1996	ICS		He96b	
42	Mo	19.9995	9.00E+04	4.50E+03	1.48E+02	2.2E+01	X	T	1977	ICS	0.764	Is77	
42	Mo	19.9995	1.50E+05	7.50E+03	1.40E+02	2.0E+00	X	T	1970	DICS		Mi70	
42	Mo	19.9995	3.00E+05	1.50E+04	1.50E+02	2.0E+00	X	T	1970	DICS		Mi70	
42	Mo	19.9995	5.00E+05	2.50E+04	1.64E+02	2.1E+00	X	T	1970	DICS		Mi70	
42	Mo	19.9995	5.00E+05	2.50E+04	1.59E+02	2.1E+00	X	T	1970	DICS		Mi70	
42	Mo	19.9995	7.00E+05	3.50E+04	1.66E+02	2.5E+00	X	T	1970	DICS		Mi70	
42	Mo	19.9995	7.00E+05	3.50E+04	1.64E+02	2.1E+00	X	T	1970	DICS		Mi70	
42	Mo	19.9995	9.00E+05	4.50E+04	1.73E+02	2.1E+00	X	T	1970	DICS		Mi70	
46	Pd	24.3503	3.00E+02	1.23E+01	6.73E+01	6.0E+00	X	T	1977	ICS	0.819	Ri77	
46	Pd	24.3503	4.00E+02	1.64E+01	6.45E+01	6.0E+00	X	T	1977	ICS	0.819	Ri77	
46	Pd	24.3503	5.00E+02	2.05E+01	6.45E+01	6.0E+00	X	T	1977	ICS	0.819	Ri77	
46	Pd	24.3503	6.00E+02	2.46E+01	6.43E+01	6.0E+00	X	T	1977	ICS	0.819	Ri77	
46	Pd	24.3503	2.50E+03	1.03E+02	7.25E+01	7.0E+00	X	T	1970	ICS		Be70	¶

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
46	Pd	24.3503	7.10E+03	2.92E+02	7.94E+01	7.9E+00	X	T	1970	ICS		Be70	¶
46	Pd	24.3503	9.00E+04	3.70E+03	1.16E+02	1.7E+01	X	T	1977	ICS	0.819	Is77	
46	Pd	24.3503	2.50E+05	1.03E+04	1.23E+02	1.8E+01	X	T	1977	ICS	0.819	Is77	
47	Ag	25.5140	2.60E+01	1.02E+00	1.90	0.30	X	T	1981	ICS	0.831	Sh81	
47	Ag	25.5140	2.60E+01	1.02E+00	2.0	0.5	X	TS	2001	ICS		Zh01	
47	Ag	25.5140	2.70E+01	1.06E+00	6.20	0.90	X	T	1981	ICS	0.831	Sh81	
47	Ag	25.5140	2.80E+01	1.10E+00	9.1	1.1	X	T	1981	ICS	0.831	Sh81	
47	Ag	25.5140	2.80E+01	1.10E+00	11.5	1.7	X	TS	2001	ICS		Zh01	
47	Ag	25.5140	2.90E+01	1.14E+00	12.5	1.6	X	T	1981	ICS	0.831	Sh81	
47	Ag	25.5140	3.00E+01	1.18E+00	26.00	0.60	X	T	1972	ICS	0.821	Da72	
47	Ag	25.5140	3.00E+01	1.18E+00	16.4	1.9	X	T	1981	ICS	0.831	Sh81	
47	Ag	25.5140	3.00E+01	1.18E+00	16.8	2.5	X	TS	2001	ICS		Zh01	
47	Ag	25.5140	3.05E+01	1.20E+00	14.7	1.3	X	T	1935	ICS	0.72	Cl35	¶
47	Ag	25.5140	3.20E+01	1.25E+00	17.5	4.4	X	T	1993	ICS	0.831	Sc93	⋆
47	Ag	25.5140	3.20E+01	1.25E+00	20.6	2.9	X	TS	2001	ICS		Zh01	
47	Ag	25.5140	3.30E+01	1.29E+00	10.7	0.6	X	T	1993	ICS	0.831	Sc93	⋆
47	Ag	25.5140	3.40E+01	1.33E+00	23.9	3.6	X	TS	2001	ICS		Zh01	
47	Ag	25.5140	3.50E+01	1.37E+00	23.7	5.9	X	T	1993	ICS	0.831	Sc93	⋆
47	Ag	25.5140	3.85E+01	1.51E+00	28.6	2.6	X	T	1935	ICS	0.72	Cl35	¶
47	Ag	25.5140	4.00E+01	1.57E+00	50.40	0.90	X	T	1972	ICS	0.821	Da72	
47	Ag	25.5140	4.00E+01	1.57E+00	39.5	9.9	X	T	1993	ICS	0.831	Sc93	⋆
47	Ag	25.5140	4.50E+01	1.76E+00	44	11	X	T	1993	ICS	0.831	Sc93	⋆
47	Ag	25.5140	5.00E+01	1.96E+00	63.9	1.0	X	T	1972	ICS	0.821	Da72	
47	Ag	25.5140	5.00E+01	1.96E+00	44	10	X	T	1967	ICS		Fi67	⋆
47	Ag	25.5140	5.00E+01	1.96E+00	52	13	X	T	1993	ICS	0.831	Sc93	⋆
47	Ag	25.5140	5.10E+01	2.00E+00	37.3	3.4	X	T	1935	ICS	0.72	Cl35	¶
47	Ag	25.5140	5.15E+01	2.02E+00	44.0	5.0	X	T	2016	ICS	0.831	**Va16**	
47	Ag	25.5140	5.29E+01	2.07E+00	43.0	5.0	X	T	2016	ICS	0.831	**Va16**	
47	Ag	25.5140	5.30E+01	2.08E+00	49	12	X	T	1993	ICS	0.831	Sc93	⋆
47	Ag	25.5140	5.50E+01	2.16E+00	52	13	X	T	1993	ICS	0.831	Sc93	⋆
47	Ag	25.5140	5.74E+01	2.25E+00	46.0	5.0	X	T	2016	ICS	0.831	**Va16**	
47	Ag	25.5140	5.80E+01	2.27E+00	51	13	X	T	1993	ICS	0.831	Sc93	⋆
47	Ag	25.5140	6.00E+01	2.35E+00	68.7	1.1	X	T	1972	ICS	0.821	Da72	
47	Ag	25.5140	6.00E+01	2.35E+00	55.0	6.6	X	T	1981	ICS	0.831	Ki81	
47	Ag	25.5140	6.00E+01	2.35E+00	53	13	X	T	1993	ICS	0.831	Sc93	⋆
47	Ag	25.5140	6.12E+01	2.40E+00	49.0	6.0	X	T	2016	ICS	0.831	**Va16**	
47	Ag	25.5140	6.38E+01	2.50E+00	40.8	3.6	X	T	1935	ICS	0.72	Cl35	¶
47	Ag	25.5140	6.47E+01	2.54E+00	51.0	6.0	X	T	2016	ICS	0.831	**Va16**	
47	Ag	25.5140	6.60E+01	2.59E+00	56	14	X	T	1993	ICS	0.831	Sc93	⋆
47	Ag	25.5140	6.87E+01	2.69E+00	52.0	6.0	X	T	2016	ICS	0.831	**Va16**	
47	Ag	25.5140	7.28E+01	2.85E+00	55.0	7.0	X	T	2016	ICS	0.831	**Va16**	
47	Ag	25.5140	7.64E+01	2.99E+00	54.0	7.0	X	T	2016	ICS	0.831	**Va16**	
47	Ag	25.5140	7.65E+01	3.00E+00	42.5	3.8	X	T	1935	ICS	0.72	Cl35	¶
47	Ag	25.5140	8.00E+01	3.14E+00	68.60	0.70	X	T	1972	ICS	0.821	Da72	
47	Ag	25.5140	8.02E+01	3.14E+00	56.0	7.0	X	T	2016	ICS	0.831	**Va16**	
47	Ag	25.5140	8.40E+01	3.29E+00	57.0	7.0	X	T	2016	ICS	0.831	**Va16**	
47	Ag	25.5140	8.83E+01	3.46E+00	54.0	7.0	X	T	2016	ICS	0.831	**Va16**	
47	Ag	25.5140	8.93E+01	3.50E+00	43.4	3.9	X	T	1935	ICS	0.72	Cl35	¶
47	Ag	25.5140	9.21E+01	3.61E+00	58.0	7.0	X	T	2016	ICS	0.831	**Va16**	
47	Ag	25.5140	9.65E+01	3.78E+00	58.0	7.0	X	T	2016	ICS	0.831	**Va16**	
47	Ag	25.5140	1.00E+02	3.92E+00	46.5	7.0	X	T	1987	ICS	0.830	**We87b**	⋆
47	Ag	25.5140	1.00E+02	3.92E+00	52.3	7.9	X	T	1987	ICS	0.830	**We87b**	⋆
47	Ag	25.5140	1.00E+02	3.92E+00	69.60	0.60	X	T	1972	ICS	0.821	Da72	
47	Ag	25.5140	1.00E+02	3.92E+00	59.0	6.0	X	T	1966	ICS	0.800	Re66	
47	Ag	25.5140	1.00E+02	3.92E+00	59.0	7.1	X	T	1981	ICS	0.831	Ki81	
47	Ag	25.5140	1.01E+02	3.95E+00	61.0	7.0	X	T	2016	ICS	0.831	**Va16**	
47	Ag	25.5140	1.02E+02	4.00E+00	42.5	3.8	X	T	1935	ICS	0.72	Cl35	¶
47	Ag	25.5140	1.02E+02	4.00E+00	41.90	0.36	X	T	1966	ICS		Ha66	⋆
47	Ag	25.5140	1.14E+02	4.47E+00	49.4	4.5	X	T	1972	ICS		Hu72	
47	Ag	25.5140	1.20E+02	4.70E+00	68.40	0.70	X	T	1972	ICS	0.821	Da72	
47	Ag	25.5140	1.21E+02	4.74E+00	40.20	0.36	X	T	1966	ICS		Ha66	⋆
47	Ag	25.5140	1.28E+02	5.02E+00	41.6	3.7	X	T	1935	ICS	0.72	Cl35	¶
47	Ag	25.5140	1.40E+02	5.49E+00	66.1	1.0	X	T	1972	ICS	0.821	Da72	
47	Ag	25.5140	1.50E+02	5.88E+00	59.0	6.0	X	T	1966	ICS	0.8	Re66	
47	Ag	25.5140	1.53E+02	6.00E+00	40.8	3.6	X	T	1935	ICS	0.72	Cl35	¶
47	Ag	25.5140	1.54E+02	6.04E+00	46.0	4.3	X	T	1966	ICS		Ha66	⋆
47	Ag	25.5140	1.79E+02	7.02E+00	39.0	3.6	X	T	1935	ICS	0.720	Cl35	¶
47	Ag	25.5140	2.00E+02	7.84E+00	52.0	5.0	X	T	1966	ICS	0.8	Re66	
47	Ag	25.5140	2.00E+02	7.84E+00	56.0	6.7	X	T	1981	ICS	0.831	Ki81	
47	Ag	25.5140	2.11E+02	8.27E+00	57.8	4.9	X	T	1966	ICS		Ha66	⋆
47	Ag	25.5140	2.50E+02	9.80E+00	52.0	5.0	X	T	1966	ICS	0.8	Re66	
47	Ag	25.5140	2.71E+02	1.06E+01	57.40	0.54	X	T	1966	ICS		Ha66	⋆
47	Ag	25.5140	3.00E+02	1.18E+01	59.9	5.4	X	T	1977	ICS	0.83	Ri77	
47	Ag	25.5140	3.00E+02	1.18E+01	49.0	5.0	X	T	1966	ICS	0.8	Re66	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
47	Ag	25.5140	3.00E+02	1.18E+01	55.9	5.6	X	T	1976	ICS	0.834	Sc76	
47	Ag	25.5140	3.00E+02	1.18E+01	54.0	6.5	X	T	1981	ICS	0.831	Ki81	
47	Ag	25.5140	3.34E+02	1.31E+01	54.3	5.6	X	T	1966	ICS		Ha66	⋆
47	Ag	25.5140	4.00E+02	1.57E+01	57.8	5.2	X	T	1977	ICS	0.83	Ri77	
47	Ag	25.5140	4.00E+02	1.57E+01	53.0	5.3	X	T	1976	ICS	0.834	Sc76	
47	Ag	25.5140	4.00E+02	1.57E+01	52.0	6.2	X	T	1981	ICS	0.831	Ki81	
47	Ag	25.5140	4.01E+02	1.57E+01	56.7	4.9	X	T	1966	ICS		Ha66	⋆
47	Ag	25.5140	4.90E+02	1.92E+01	36.8	9.0	X	T	1974	ICS	0.83	Se74	
47	Ag	25.5140	5.00E+02	1.96E+01	56.1	5.1	X	T	1977	ICS	0.83	Ri77	
47	Ag	25.5140	5.00E+02	1.96E+01	50.2	5.0	X	T	1976	ICS	0.834	Sc76	
47	Ag	25.5140	5.00E+02	1.96E+01	52.0	6.2	X	T	1981	ICS	0.831	Ki81	
47	Ag	25.5140	6.00E+02	2.35E+01	54.6	5.0	X	T	1977	ICS	0.83	Ri77	
47	Ag	25.5140	6.00E+02	2.35E+01	52.1	5.2	X	T	1976	ICS	0.834	Sc76	
47	Ag	25.5140	6.00E+02	2.35E+01	52.0	6.2	X	T	1981	ICS	0.831	Ki81	
47	Ag	25.5140	6.70E+02	2.63E+01	40	10	X	T	1974	ICS	0.83	Se74	
47	Ag	25.5140	1.00E+03	3.92E+01	47.0	5.0	X	T	1966	ICS	0.8	Re66	
47	Ag	25.5140	2.04E+03	8.00E+01	55.2	5.0	X	T	1972	ICS	0.83	**Sc72**	⋆
47	Ag	25.5140	2.04E+03	8.00E+01	57.6	5.2	X	T	1972	ICS	0.83	**Sc72**	⋆
47	Ag	25.5140	2.90E+03	1.14E+02	54.3	3.1	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	3.90E+03	1.53E+02	54.7	2.7	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	4.55E+03	1.78E+02	55.3	2.8	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	6.29E+03	2.47E+02	61.4	3.7	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	7.40E+03	2.90E+02	62.7	2.6	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	7.88E+03	3.09E+02	62.6	2.2	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	8.33E+03	3.26E+02	62.4	2.3	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	9.33E+03	3.66E+02	62.8	3.2	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	1.18E+04	4.62E+02	66.1	3.5	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	1.33E+04	5.21E+02	63.6	3.5	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	1.45E+04	5.68E+02	68.4	3.5	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	1.95E+04	7.64E+02	74.5	4.3	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	2.00E+04	7.84E+02	77.0	5.0	X	T	1979	ICS	0.83	Ho79	
47	Ag	25.5140	2.12E+04	8.31E+02	75.0	4.3	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	2.24E+04	8.78E+02	70.6	4.7	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	2.92E+04	1.14E+03	84.8	8.8	X	T	1975	ICS		**Da75**	⋆
47	Ag	25.5140	3.50E+04	1.37E+03	86.0	5.0	X	T	1979	ICS	0.83	Ho79	
47	Ag	25.5140	5.00E+04	1.96E+03	87.0	5.0	X	T	1979	ICS	0.83	Ho79	
47	Ag	25.5140	6.00E+04	2.35E+03	95.0	6.0	X	T	1979	ICS	0.83	Ho79	
47	Ag	25.5140	3.00E+05	1.18E+04	119	11	X	T	1987	ICS	0.83	**Wa87**	⋆
47	Ag	25.5140	3.50E+05	1.37E+04	106	12	X	T	1987	ICS	0.83	**Wa87**	⋆
47	Ag	25.5140	3.80E+05	1.49E+04	112	10	X	T	1987	ICS	0.83	**Wa87**	⋆
47	Ag	25.5140	9.00E+05	3.53E+04	147	11	X	T	1982	ICS	0.83	Ge82	
47	Ag	25.5140	1.50E+06	5.88E+04	144	11	X	T	1982	ICS	0.83	Ge82	
47	Ag	25.5140	2.00E+06	7.84E+04	155	11	X	T	1982	ICS	0.83	Ge82	
48	Cd	26.7112	2.04E+03	7.64E+01	4.61E+01	4.1E+00	X	T	1972	ICS	0.84	Sc72	¶
49	In	27.9399	3.00E+02	1.07E+01	5.72E+01	5.2E+00	X	T	1977	ICS	0.85	Ri77	
49	In	27.9399	4.00E+02	1.43E+01	5.57E+01	5.0E+00	X	T	1977	ICS	0.85	Ri77	
49	In	27.9399	5.00E+02	1.79E+01	5.63E+01	5.1E+00	X	T	1977	ICS	0.85	Ri77	
49	In	27.9399	6.00E+02	2.15E+01	5.66E+01	5.1E+00	X	T	1977	ICS	0.85	Ri77	
49	In	27.9399	2.04E+03	7.30E+01	4.37E+01	3.9E+00	X	T	1972	ICS	0.85	Sc72	¶
49	In	27.9399	1.50E+05	5.37E+03	9.39E+01	1.3E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	3.00E+05	1.07E+04	1.07E+02	1.5E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	3.00E+05	1.07E+04	1.16E+02	1.6E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	3.00E+05	1.07E+04	1.17E+02	1.5E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	3.00E+05	1.07E+04	1.17E+02	1.5E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	3.00E+05	1.07E+04	1.15E+02	1.5E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	5.00E+05	1.79E+04	1.16E+02	1.5E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	5.00E+05	1.79E+04	1.15E+02	1.8E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	5.00E+05	1.79E+04	1.27E+02	1.9E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	5.00E+05	1.79E+04	1.20E+02	1.6E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	7.00E+05	2.51E+04	1.18E+02	1.6E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	7.00E+05	2.51E+04	1.18E+02	1.6E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	7.00E+05	2.51E+04	1.29E+02	1.8E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	9.00E+05	3.22E+04	1.22E+02	1.5E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	9.00E+05	3.22E+04	1.32E+02	1.8E+00	X	T	1970	DICS		Mi70	
49	In	27.9399	1.50E+05	5.37E+03	1.28E+02	1.9E+01	X	T	1977	ICS	0.85	Is77	
50	Sn	29.2001	5.00E+01	1.71E+00	3.93E+01	9.6E−01	X	T	1964	ICS	0.84	**Mo64**	⋆
50	Sn	29.2001	5.00E+01	1.71E+00	3.25E+01	8.0E+00	X	T	1967	ICS		Fi67	⋆
50	Sn	29.2001	1.00E+02	3.42E+00	4.99E+01	5.2E+00	X	T	1964	ICS	0.84	**Mo64**	⋆
50	Sn	29.2001	1.00E+02	3.42E+00	5.10E+01	7.7E+00	X	T	1987	ICS	0.859	**We87b**	⋆
50	Sn	29.2001	1.02E+02	3.51E+00	2.52E+01	2.0E+00	X	T	1966	ICS		Ha66	⋆
50	Sn	29.2001	1.23E+02	4.23E+00	2.95E+01	2.7E+00	X	T	1966	ICS		Ha66	⋆
50	Sn	29.2001	1.53E+02	5.25E+00	4.51E+01	4.2E+00	X	T	1966	ICS		Ha66	⋆
50	Sn	29.2001	2.00E+02	6.85E+00	4.62E+01	2.0E+00	X	T	1964	ICS	0.84	**Mo64**	⋆
50	Sn	29.2001	2.00E+02	6.85E+00	4.70E+01	5.0E+00	X	T	1966	ICS	0.84	Re66	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
50	Sn	29.2001	2.12E+02	7.27E+00	4.35E+01	4.2E+00	X	T	1966	ICS		Ha66	⋆
50	Sn	29.2001	2.40E+02	8.22E+00	5.80E+01	3.0E+00	X	T	1964	ICS		Ha64	
50	Sn	29.2001	2.73E+02	9.34E+00	4.82E+01	4.5E+00	X	T	1966	ICS		Ha66	⋆
50	Sn	29.2001	3.00E+02	1.03E+01	5.10E+01	4.6E+00	X	T	1977	ICS	0.859	Ri77	
50	Sn	29.2001	3.36E+02	1.15E+01	6.00E+01	5.4E+00	X	T	1966	ICS		Ha66	⋆
50	Sn	29.2001	4.00E+02	1.37E+01	4.89E+01	4.4E+00	X	T	1977	ICS	0.859	Ri77	
50	Sn	29.2001	4.03E+02	1.38E+01	5.43E+01	5.4E+00	X	T	1966	ICS		Ha66	⋆
50	Sn	29.2001	5.00E+02	1.71E+01	4.10E+01	2.5E+00	X	T	1964	ICS	0.84	**Mo64**	⋆
50	Sn	29.2001	5.00E+02	1.71E+01	4.88E+01	4.4E+00	X	T	1977	ICS	0.859	Ri77	
50	Sn	29.2001	5.30E+02	1.82E+01	6.10E+01	3.0E+00	X	T	1964	ICS		Ha64	
50	Sn	29.2001	6.00E+02	2.05E+01	4.85E+01	4.4E+00	X	T	1977	ICS	0.859	Ri77	
50	Sn	29.2001	6.00E+02	2.05E+01	4.00E+01	4.0E+00	X	T	1966	ICS	0.84	Re66	
50	Sn	29.2001	8.00E+02	2.74E+01	3.90E+01	4.0E+00	X	T	1966	ICS	0.84	Re66	
50	Sn	29.2001	8.20E+02	2.81E+01	6.80E+01	4.0E+00	X	T	1964	ICS		Ha64	
50	Sn	29.2001	1.00E+03	3.42E+01	3.90E+01	4.0E+00	X	T	1966	ICS	0.84	Re66	
50	Sn	29.2001	1.13E+03	3.87E+01	7.20E+01	4.0E+00	X	T	1964	ICS		Ha64	
50	Sn	29.2001	1.20E+03	4.11E+01	4.00E+01	4.0E+00	X	T	1966	ICS	0.84	Re66	
50	Sn	29.2001	1.40E+03	4.79E+01	4.20E+01	4.0E+00	X	T	1966	ICS	0.84	Re66	
50	Sn	29.2001	1.44E+03	4.93E+01	7.20E+01	4.0E+00	X	T	1964	ICS		Ha64	
50	Sn	29.2001	1.70E+03	5.82E+01	4.30E+01	4.0E+00	X	T	1966	ICS	0.84	Re66	
50	Sn	29.2001	2.00E+03	6.85E+01	4.40E+01	4.0E+00	X	T	1966	ICS	0.84	Re66	
50	Sn	29.2001	2.04E+03	6.99E+01	4.30E+01	3.9E+00	X	T	1972	ICS	0.859	Sc72	¶
50	Sn	29.2001	2.00E+04	6.85E+02	7.10E+01	5.0E+00	X	T	1979	ICS	0.859	Ho79	
50	Sn	29.2001	5.00E+04	1.71E+03	8.30E+01	6.0E+00	X	T	1979	ICS	0.859	Ho79	
50	Sn	29.2001	1.50E+05	5.14E+03	1.11E+02	1.7E+01	X	T	1977	ICS	0.859	Is77	
50	Sn	29.2001	3.80E+05	1.30E+04	7.74E+01	9.6E+00	X	T	1987	ICS	0.859	**Wa87**	⋆
51	Sb	30.4912	6.00E+01	1.97E+00	3.40E+01	4.1E+00	X	T	1981	ICS	0.87	Ki81	
51	Sb	30.4912	1.00E+02	3.28E+00	4.00E+01	4.8E+00	X	T	1981	ICS	0.87	Ki81	
51	Sb	30.4912	2.00E+02	6.56E+00	4.10E+01	4.9E+00	X	T	1981	ICS	0.87	Ki81	
51	Sb	30.4912	3.00E+02	9.84E+00	3.80E+01	4.6E+00	X	T	1981	ICS	0.87	Ki81	
51	Sb	30.4912	4.00E+02	1.31E+01	3.70E+01	4.4E+00	X	T	1981	ICS	0.87	Ki81	
51	Sb	30.4912	5.00E+02	1.64E+01	3.70E+01	4.4E+00	X	T	1981	ICS	0.87	Ki81	
51	Sb	30.4912	6.00E+02	1.97E+01	3.80E+01	4.6E+00	X	T	1981	ICS	0.87	Ki81	
51	Sb	30.4912	2.04E+03	6.69E+01	4.04E+01	3.6E+00	X	T	1972	ICS	0.867	Sc72	⋆
51	Sb	30.4912	2.04E+03	6.69E+01	4.20E+01	3.8E+00	X	T	1972	ICS	0.867	Sc72	⋆
52	Te	31.8138	3.36E+01	1.05E+00	5.19E+00	2.6E−01	X	T	2019	ICS	0.877	**Sa19**	
52	Te	31.8138	3.54E+01	1.11E+00	9.40E+00	5.0E−01	X	T	2019	ICS	0.877	**Sa19**	
52	Te	31.8138	3.83E+01	1.21E+00	1.50E+01	8.0E−01	X	T	2019	ICS	0.877	**Sa19**	
52	Te	31.8138	4.13E+01	1.30E+00	1.92E+01	9.0E−01	X	T	2019	ICS	0.877	**Sa19**	
52	Te	31.8138	4.55E+01	1.43E+00	2.43E+01	1.1E+00	X	T	2019	ICS	0.877	**Sa19**	
52	Te	31.8138	5.09E+01	1.60E+00	2.88E+01	1.4E+00	X	T	2019	ICS	0.877	**Sa19**	
52	Te	31.8138	5.53E+01	1.74E+00	3.14E+01	1.6E+00	X	T	2019	ICS	0.877	**Sa19**	
52	Te	31.8138	6.07E+01	1.91E+00	3.45E+01	1.7E+00	X	T	2019	ICS	0.877	**Sa19**	
52	Te	31.8138	7.07E+01	2.22E+00	3.77E+01	1.8E+00	X	T	2019	ICS	0.877	**Sa19**	
52	Te	31.8138	7.99E+01	2.51E+00	3.97E+01	1.9E+00	X	T	2019	ICS	0.877	**Sa19**	
52	Te	31.8138	9.02E+01	2.84E+00	4.11E+01	2.0E+00	X	T	2019	ICS	0.877	**Sa19**	
52	Te	31.8138	9.97E+01	3.14E+00	4.17E+01	2.0E+00	X	T	2019	ICS	0.877	**Sa19**	
52	Te	31.8138	1.00E+02	3.14E+00	3.85E+01	5.8E+00	X	T	1987	ICS	0.875	**We87b**	⋆
52	Te	31.8138	2.04E+03	6.41E+01	3.79E+01	3.4E+00	X	T	1972	ICS	0.875	Sc72	¶
52	Te	31.8138	3.00E+05	9.43E+03	9.00E+01	5.3E+00	X	TS	1987	ICS	0.875	**Wa87**	⋆
52	Te	31.8138	3.80E+05	1.19E+04	9.77E+01	1.8E+01	X	TS	1987	ICS	0.875	**Wa87**	⋆
54	Xe	34.5644	2.00E+04	5.79E+02	5.00E+01	5.0E+00	X	G	1979	ICS	0.889	Ho79	
54	Xe	34.5644	3.00E+04	8.68E+02	5.50E+01	5.0E+00	X	G	1979	ICS	0.889	Ho79	
54	Xe	34.5644	4.00E+04	1.16E+03	5.70E+01	5.0E+00	X	G	1979	ICS	0.889	Ho79	
54	Xe	34.5644	5.00E+04	1.45E+03	5.80E+01	5.0E+00	X	G	1979	ICS	0.889	Ho79	
54	Xe	34.5644	6.00E+04	1.74E+03	6.00E+01	5.0E+00	X	G	1979	ICS	0.889	Ho79	
56	Ba	37.4406	1.00E+02	2.67E+00	2.65E+01	4.0E+00	X	T	1987	ICS	0.901	**We87b**	⋆
56	Ba	37.4406	2.04E+03	5.45E+01	3.02E+01	2.7E+00	X	T	1972	ICS	0.901	Sc72	¶
56	Ba	37.4406	7.00E+04	1.87E+03	7.64E+01	1.1E+01	X	T	1977	ICS	0.901	Is77	
56	Ba	37.4406	9.00E+04	2.40E+03	6.86E+01	1.0E+01	X	T	1977	ICS	0.901	Is77	
56	Ba	37.4406	1.50E+05	4.01E+03	7.76E+01	1.2E+01	X	T	1977	ICS	0.901	Is77	
56	Ba	37.4406	2.70E+05	7.21E+03	8.95E+01	1.3E+01	X	T	1977	ICS	0.901	Is77	
57	La	38.9246	1.00E+02	2.57E+00	2.38E+01	3.6E+00	X	T	1987	ICS	0.906	**We87b**	⋆
57	La	38.9246	2.04E+03	5.24E+01	1.92E+01	1.7E+00	X	T	1972	ICS	0.906	Sc72	¶
58	Ce	40.4430	2.04E+03	5.04E+01	2.31E+01	2.1E+00	X	T	1972	ICS	0.911	Sc72	⋆
58	Ce	40.4430	2.04E+03	5.04E+01	2.40E+01	2.2E+00	X	T	1972	ICS	0.911	Sc72	⋆
59	Pr	41.9906	1.00E+02	2.38E+00	2.05E+01	3.1E+00	X	T	1987	ICS	0.915	**We87b**	⋆
59	Pr	41.9906	2.04E+03	4.86E+01	2.44E+01	2.2E+00	X	T	1972	ICS	0.915	Sc72	¶
60	Nd	43.5689	2.04E+03	4.68E+01	2.13E+01	1.9E+00	X	T	1972	ICS	0.920	Sc72	⋆
60	Nd	43.5689	2.04E+03	4.68E+01	2.19E+01	2.0E+00	X	T	1972	ICS	0.920	Sc72	⋆
62	Sm	46.8342	2.04E+03	4.36E+01	2.01E+01	1.8E+00	X	T	1972	ICS	0.928	Sc72	⋆
62	Sm	46.8342	2.04E+03	4.36E+01	2.20E+01	2.0E+00	X	T	1972	ICS	0.928	Sc72	⋆
62	Sm	46.8342	9.00E+04	1.92E+03	5.36E+01	8.0E+00	X	T	1977	ICS	0.928	Is77	
63	Eu	48.5190	2.04E+03	4.20E+01	2.12E+01	1.9E+00	X	T	1972	ICS	0.931	Sc72	¶

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
64	Gd	50.2391	2.04E+03	4.06E+01	2.11E+01	1.9E+00	X	T	1972	ICS	0.934	Sc72	¶
65	Tb	51.9957	1.00E+02	1.92E+00	1.30E+01	2.0E+00	X	T	1987	ICS	0.937	**We87b**	⋆
67	Ho	55.6177	2.00E+04	3.60E+02	3.40E+01	3.0E+00	X	T	1979	ICS	0.943	Ho79	
67	Ho	55.6177	5.00E+04	8.99E+02	4.20E+01	4.0E+00	X	T	1979	ICS	0.943	Ho79	
67	Ho	55.6177	9.00E+04	1.62E+03	3.79E+01	5.7E+00	X	T	1977	ICS	0.943	Is77	
68	Er	57.4855	2.04E+03	3.55E+01	1.61E+01	1.4E+00	X	T	1972	ICS	0.945	Sc72	⋆
68	Er	57.4855	2.04E+03	3.55E+01	1.81E+01	1.4E+00	X	T	1972	ICS	0.945	Sc72	⋆
69	Tm	59.3896	3.00E+05	5.05E+03	4.49E+01	6.3E−01	X	T	1970	DICS		Mi70	
69	Tm	59.3896	3.00E+05	5.05E+03	5.10E+01	8.8E−01	X	T	1970	DICS		Mi70	
69	Tm	59.3896	5.00E+05	8.42E+03	4.70E+01	6.3E−01	X	T	1970	DICS		Mi70	
69	Tm	59.3896	7.00E+05	1.18E+04	4.81E+01	6.3E−01	X	T	1970	DICS		Mi70	
69	Tm	59.3896	7.00E+05	1.18E+04	4.79E+01	6.3E−01	X	T	1970	DICS		Mi70	
69	Tm	59.3896	9.00E+05	1.52E+04	5.00E+01	6.3E−01	X	T	1970	DICS		Mi70	
70	Yb	61.3323	4.90E+02	7.99E+00	1.32E+01	3.3E+00	X	T	1974	ICS	0.95	Se74	
70	Yb	61.3323	6.70E+02	1.09E+01	1.66E+01	4.1E+00	X	T	1974	ICS	0.95	Se74	
70	Yb	61.3323	2.04E+03	3.33E+01	1.44E+01	1.3E+00	X	T	1972	ICS	0.95	Sc72	⋆
70	Yb	61.3323	2.04E+03	3.33E+01	1.63E+01	8.5E−01	X	T	1972	ICS	0.95	Sc72	⋆
73	Ta	67.4164	6.86E+01	1.02E+00	4.60E−01	2.5E−02	X	T	2019	ICS	0.957	**Sa19**	
73	Ta	67.4164	7.06E+01	1.05E+00	1.08E+00	7.0E−02	X	T	2019	ICS	0.957	**Sa19**	
73	Ta	67.4164	7.24E+01	1.07E+00	1.61E+00	8.0E−02	X	T	2019	ICS	0.957	**Sa19**	
73	Ta	67.4164	7.55E+01	1.12E+00	2.41E+00	1.2E−01	X	T	2019	ICS	0.957	**Sa19**	
73	Ta	67.4164	8.03E+01	1.19E+00	3.50E+00	1.6E−01	X	T	2019	ICS	0.957	**Sa19**	
73	Ta	67.4164	8.56E+01	1.27E+00	4.58E+00	2.2E−01	X	T	2019	ICS	0.957	**Sa19**	
73	Ta	67.4164	9.05E+01	1.34E+00	5.27E+00	2.5E−01	X	T	2019	ICS	0.957	**Sa19**	
73	Ta	67.4164	9.52E+01	1.41E+00	5.98E+00	2.8E−01	X	T	2019	ICS	0.957	**Sa19**	
73	Ta	67.4164	9.96E+01	1.48E+00	6.60E+00	3.0E−01	X	T	2019	ICS	0.957	**Sa19**	
73	Ta	67.4164	4.90E+02	7.27E+00	1.13E+01	2.8E+00	X	T	1974	ICS	0.956	Se74	
73	Ta	67.4164	6.70E+02	9.94E+00	1.50E+01	3.0E+00	X	T	1974	ICS	0.956	Se74	
73	Ta	67.4164	3.00E+05	4.45E+03	3.91E+01	5.0E−01	X	T	1970	DICS		Mi70	
73	Ta	67.4164	5.00E+05	7.42E+03	4.15E+01	5.0E−01	X	T	1970	DICS		Mi70	
73	Ta	67.4164	5.00E+05	7.42E+03	4.60E+01	1.6E+00	X	T	1970	DICS		Mi70	
74	W	69.5250	2.09E+02	3.01E+00	4.97E+00	1.6E+00	X	T	1966	ICS		Ha66	⋆
74	W	69.5250	2.40E+02	3.45E+00	1.96E+01	1.6E+00	X	T	1964	ICS		Ha64	
74	W	69.5250	2.41E+02	3.47E+00	5.96E+00	2.0E+00	X	T	1966	ICS		Ha66	⋆
74	W	69.5250	2.71E+02	3.90E+00	1.17E+01	2.0E+00	X	T	1966	ICS		Ha66	⋆
74	W	69.5250	3.36E+02	4.83E+00	1.63E+01	2.7E+00	X	T	1966	ICS		Ha66	⋆
74	W	69.5250	4.02E+02	5.78E+00	1.30E+01	2.3E+00	X	T	1966	ICS		Ha66	⋆
74	W	69.5250	4.68E+02	6.73E+00	1.92E+01	3.9E+00	X	T	1966	ICS		Ha66	⋆
74	W	69.5250	5.30E+02	7.62E+00	2.38E+01	2.5E+00	X	T	1964	ICS		Ha64	
74	W	69.5250	5.47E+02	7.87E+00	2.58E+01	4.7E+00	X	T	1966	ICS		Ha66	⋆
74	W	69.5250	8.20E+02	1.18E+01	3.45E+01	3.5E+00	X	T	1964	ICS		Ha64	
74	W	69.5250	1.13E+03	1.63E+01	3.40E+01	3.5E+00	X	T	1964	ICS		Ha64	
74	W	69.5250	1.44E+03	2.07E+01	2.49E+01	3.8E+00	X	T	1964	ICS		Ha64	
78	Pt	78.3948	2.04E+03	2.60E+01	1.22E+01	8.5E−01	X	T	1972	ICS	0.963	**Sc72**	¶
79	Au	80.7249	8.29E+01	1.03E+00	3.60E−01	4.0E−02	X	T	2014	ICS	0.964	**Fe14**	
79	Au	80.7249	8.44E+01	1.05E+00	7.60E−01	2.0E−02	X	T	2014	ICS	0.964	**Fe14**	
79	Au	80.7249	8.66E+01	1.07E+00	1.16E+00	3.0E−02	X	T	2014	ICS	0.964	**Fe14**	
79	Au	80.7249	8.81E+01	1.09E+00	1.39E+00	4.0E−02	X	T	2014	ICS	0.964	**Fe14**	
79	Au	80.7249	8.99E+01	1.11E+00	1.60E+00	2.3E−01	X	T	2015	ICS	0.964	**Ba15**	
79	Au	80.7249	9.00E+01	1.11E+00	2.50E+00	3.0E−01	X	T	1972	ICS	0.950	Da72	
79	Au	80.7249	9.04E+01	1.12E+00	1.81E+00	4.0E−02	X	T	2014	ICS	0.964	**Fe14**	
79	Au	80.7249	9.19E+01	1.14E+00	2.04E+00	4.0E−02	X	T	2014	ICS	0.964	**Fe14**	
79	Au	80.7249	9.43E+01	1.17E+00	2.37E+00	5.0E−02	X	T	2014	ICS	0.964	**Fe14**	
79	Au	80.7249	9.60E+01	1.19E+00	2.54E+00	5.0E−02	X	T	2014	ICS	0.964	**Fe14**	
79	Au	80.7249	9.80E+01	1.21E+00	2.83E+00	5.0E−02	X	T	2014	ICS	0.964	**Fe14**	
79	Au	80.7249	1.00E+02	1.24E+00	5.57E+00	9.6E−01	X	T	1964	ICS	0.950	Mo64	⋆
79	Au	80.7249	1.00E+02	1.24E+00	4.50E+00	1.0E−01	X	T	1972	ICS	0.950	Da72	
79	Au	80.7249	1.00E+02	1.24E+00	1.65E+00	2.5E−01	X	T	1987	ICS	0.964	**We87b**	⋆
79	Au	80.7249	1.00E+02	1.24E+00	3.11E+00	5.0E−02	X	T	2014	ICS	0.964	**Fe14**	
79	Au	80.7249	1.00E+02	1.24E+00	2.90E+00	3.8E−01	X	T	2015	ICS	0.964	**Ba15**	
79	Au	80.7249	1.20E+02	1.49E+00	6.00E+00	1.0E−01	X	T	1972	ICS	0.950	Da72	
79	Au	80.7249	1.40E+02	1.73E+00	6.60E+00	1.0E−01	X	T	1972	ICS	0.950	Da72	
79	Au	80.7249	2.00E+02	2.48E+00	9.47E+00	3.7E−01	X	T	1964	ICS	0.950	Mo64	⋆
79	Au	80.7249	2.00E+02	2.48E+00	8.70E+00	1.0E+00	X	T	1966	ICS	0.950	Re66	
79	Au	80.7249	2.36E+02	2.92E+00	1.05E+01	1.9E+00	X	T	1966	ICS		Ha66	⋆
79	Au	80.7249	2.68E+02	3.32E+00	1.55E+01	3.0E+00	X	T	1966	ICS		Ha66	⋆
79	Au	80.7249	2.99E+02	3.70E+00	1.21E+01	2.4E+00	X	T	1966	ICS		Ha66	⋆
79	Au	80.7249	3.29E+02	4.08E+00	1.33E+01	2.5E+00	X	T	1966	ICS		Ha66	⋆
79	Au	80.7249	3.95E+02	4.89E+00	1.83E+01	3.4E+00	X	T	1966	ICS		Ha66	⋆
79	Au	80.7249	4.62E+02	5.72E+00	1.87E+01	4.0E+00	X	T	1966	ICS		Ha66	⋆
79	Au	80.7249	4.90E+02	6.07E+00	1.06E+01	2.6E+00	X	T	1974	ICS	0.964	Se74	
79	Au	80.7249	5.00E+02	6.19E+00	1.23E+01	9.0E−01	X	T	1964	ICS	0.950	Mo64	⋆
79	Au	80.7249	5.44E+02	6.74E+00	1.87E+01	3.8E+00	X	T	1966	ICS		Ha66	⋆
79	Au	80.7249	6.00E+02	7.43E+00	1.00E+01	1.0E+00	X	T	1966	ICS	0.950	Re66	

(*continued on next page*)

Table 1 (*continued*)

Z	Symbol	I_K (keV)	E (keV)	U E/I_K	σ_K (barn)	$\Delta\sigma_K$ (barn)	Method	Target	Year	Reported Datum	ω_K	Refs.	Notes
79	Au	80.7249	6.70E+02	8.30E+00	1.47E+01	3.6E+00	X	T	1974	ICS	0.964	Se74	
79	Au	80.7249	8.00E+02	9.91E+00	1.00E+01	1.0E+00	X	T	1966	ICS	0.950	Re66	
79	Au	80.7249	1.00E+03	1.24E+01	1.00E+01	1.0E+00	X	T	1966	ICS	0.950	Re66	
79	Au	80.7249	1.20E+03	1.49E+01	1.00E+01	1.0E+00	X	T	1966	ICS	0.950	Re66	
79	Au	80.7249	1.40E+03	1.73E+01	1.00E+01	1.0E+00	X	T	1966	ICS	0.950	Re66	
79	Au	80.7249	1.70E+03	2.11E+01	1.10E+01	1.0E+00	X	T	1966	ICS	0.950	Re66	
79	Au	80.7249	2.00E+03	2.48E+01	1.10E+01	1.0E+00	X	T	1966	ICS	0.950	Re66	
79	Au	80.7249	2.00E+03	2.48E+01	1.21E+01	1.1E+00	X	T	1972	ICS	0.964	Sc72	¶
79	Au	80.7249	2.50E+03	3.10E+01	1.10E+01	1.1E−01	X	T	1970	ICS		Be70	
79	Au	80.7249	2.90E+03	3.59E+01	1.25E+01	6.0E−01	X	T	1975	ICS		**Da75**	⋆
79	Au	80.7249	4.00E+03	4.96E+01	1.29E+01	1.3E+00	X	T	1975	ICS		**Da75**	⋆
79	Au	80.7249	4.50E+03	5.57E+01	1.36E+01	7.0E−01	X	T	1975	ICS		**Da75**	⋆
79	Au	80.7249	6.29E+03	7.79E+01	1.17E+01	1.8E+00	X	T	1975	ICS		**Da75**	⋆
79	Au	80.7249	7.00E+03	8.67E+01	1.40E+01	1.4E−01	X	T	1970	ICS		Be70	
79	Au	80.7249	7.70E+03	9.54E+01	1.48E+01	1.3E+00	X	T	1975	ICS		**Da75**	⋆
79	Au	80.7249	8.00E+03	9.91E+01	1.46E+01	1.0E+00	X	T	1975	ICS		**Da75**	⋆
79	Au	80.7249	8.50E+03	1.05E+02	1.54E+01	8.0E−01	X	T	1975	ICS		**Da75**	⋆
79	Au	80.7249	1.18E+04	1.46E+02	1.55E+01	9.0E−01	X	T	1975	ICS		**Da75**	⋆
79	Au	80.7249	1.32E+04	1.64E+02	1.58E+01	9.0E−01	X	T	1975	ICS		**Da75**	⋆
79	Au	80.7249	1.46E+04	1.81E+02	1.58E+01	9.0E−01	X	T	1975	ICS		**Da75**	⋆
79	Au	80.7249	1.97E+04	2.44E+02	1.63E+01	1.4E+00	X	T	1975	ICS		**Da75**	⋆
79	Au	80.7249	2.00E+04	2.48E+02	2.26E+01	1.0E+00	X	T	1979	ICS	0.964	Ho79	
79	Au	80.7249	2.04E+04	2.53E+02	1.82E+01	1.0E+00	X	T	1975	ICS		**Da75**	⋆
79	Au	80.7249	2.20E+04	2.73E+02	2.03E+01	1.4E+00	X	T	1975	ICS		**Da75**	⋆
79	Au	80.7249	3.50E+04	4.34E+02	2.42E+01	1.0E+00	X	T	1979	ICS	0.964	Ho79	
79	Au	80.7249	5.00E+04	6.19E+02	2.50E+01	1.0E+00	X	T	1979	ICS	0.964	Ho79	
79	Au	80.7249	6.00E+04	7.43E+02	2.66E+01	1.0E+00	X	T	1979	ICS	0.964	Ho79	
79	Au	80.7249	9.00E+04	1.11E+03	2.85E+01	2.9E+00	X	T	1977	ICS	0.964	Is77	
79	Au	80.7249	3.00E+05	3.72E+03	3.04E+01	3.8E−01	X	T	1970	DICS		Mi70	
79	Au	80.7249	5.00E+05	6.19E+03	3.04E+01	5.0E−01	X	T	1970	DICS		Mi70	
79	Au	80.7249	7.00E+05	8.67E+03	3.04E+01	5.0E−01	X	T	1970	DICS		Mi70	
79	Au	80.7249	9.00E+05	1.11E+04	3.04E+01	5.0E−01	X	T	1970	DICS		Mi70	
82	Pb	88.0045	2.40E+02	2.73E+00	1.71E+01	2.0E+00	X	T	1964	ICS		Ha64	
82	Pb	88.0045	2.68E+02	3.05E+00	1.90E+01	3.5E+00	X	T	1966	ICS		Ha66	⋆
82	Pb	88.0045	3.05E+02	3.47E+00	9.96E+00	2.1E+00	X	T	1966	ICS		Ha66	⋆
82	Pb	88.0045	3.37E+02	3.83E+00	2.20E+01	3.8E+00	X	T	1966	ICS		Ha66	⋆
82	Pb	88.0045	4.00E+02	4.54E+00	1.33E+01	2.4E+00	X	T	1966	ICS		Ha66	⋆
82	Pb	88.0045	4.71E+02	5.35E+00	1.96E+01	3.8E+00	X	T	1966	ICS		Ha66	⋆
82	Pb	88.0045	4.90E+02	5.57E+00	6.50E+00	3.2E+00	X	T	1974	ICS	0.968	Se74	
82	Pb	88.0045	5.30E+02	6.02E+00	1.87E+01	2.8E+00	X	T	1964	ICS		Ha64	
82	Pb	88.0045	5.48E+02	6.23E+00	2.86E+01	5.2E+00	X	T	1966	ICS		Ha66	⋆
82	Pb	88.0045	6.70E+02	7.61E+00	9.70E+00	4.8E+00	X	T	1974	ICS	0.968	Se74	
82	Pb	88.0045	8.20E+02	9.32E+00	2.55E+01	3.5E+00	X	T	1964	ICS		Ha64	
82	Pb	88.0045	1.13E+03	1.28E+01	2.60E+01	3.5E+00	X	T	1964	ICS		Ha64	
82	Pb	88.0045	1.44E+03	1.64E+01	2.48E+01	5.0E+00	X	T	1964	ICS		Ha64	
82	Pb	88.0045	2.04E+03	2.32E+01	1.02E+01	1.6E+00	X	T	1972	ICS	0.968	Sc72	¶
82	Pb	88.0045	5.00E+04	5.68E+02	2.40E+01	2.0E+00	X	T	1979	ICS	0.968	Ho79	
82	Pb	88.0045	9.00E+04	1.02E+03	2.26E+01	2.3E+00	X	T	1977	ICS	0.968	Is77	
83	Bi	90.5259	9.16E+01	1.01E+00	1.82E−01	1.3E−02	X	T	2019	ICS	0.968	**Sa19**	
83	Bi	90.5259	9.16E+01	1.01E+00	2.06E−01	1.5E−02	X	T	2019	ICS	0.968	**Sa19**	
83	Bi	90.5259	9.20E+01	1.02E+00	1.70E−01	3.0E−02	X	T	2014	ICS	0.968	**Fe14**	
83	Bi	90.5259	9.33E+01	1.03E+00	4.71E−01	2.5E−02	X	T	2019	ICS	0.968	**Sa19**	
83	Bi	90.5259	9.39E+01	1.04E+00	4.90E−01	3.0E−02	X	T	2014	ICS	0.968	**Fe14**	
83	Bi	90.5259	9.41E+01	1.04E+00	6.00E−01	3.0E−02	X	T	2019	ICS	0.968	**Sa19**	
83	Bi	90.5259	9.58E+01	1.06E+00	7.20E−01	3.0E−02	X	T	2014	ICS	0.968	**Fe14**	
83	Bi	90.5259	9.63E+01	1.06E+00	8.80E−01	4.0E−02	X	T	2019	ICS	0.968	**Sa19**	
83	Bi	90.5259	9.81E+01	1.08E+00	9.80E−01	4.0E−02	X	T	2014	ICS	0.968	**Fe14**	
83	Bi	90.5259	9.86E+01	1.09E+00	1.11E+00	5.0E−02	X	T	2019	ICS	0.968	**Sa19**	
83	Bi	90.5259	9.97E+01	1.10E+00	1.36E+00	6.0E−02	X	T	2019	ICS	0.968	**Sa19**	
83	Bi	90.5259	9.99E+01	1.10E+00	1.26E+00	4.0E−02	X	T	2014	ICS	0.968	**Fe14**	
83	Bi	90.5259	2.04E+03	2.25E+01	9.91E+00	1.6E+00	X	T	1972	ICS		Sc72	¶
83	Bi	90.5259	3.50E+04	3.87E+02	2.10E+01	1.0E+00	X	T	1979	ICS	0.970	Ho79	
83	Bi	90.5259	5.00E+04	5.52E+02	2.10E+01	1.0E+00	X	T	1979	ICS	0.970	Ho79	
83	Bi	90.5259	6.00E+04	6.63E+02	2.21E+01	1.0E+00	X	T	1979	ICS	0.970	Ho79	
83	Bi	90.5259	9.00E+04	9.94E+02	2.14E+01	2.1E+00	X	T	1977	ICS	0.970	Is77	
83	Bi	90.5259	3.00E+05	3.31E+03	2.98E+01	5.0E−01	X	T	1970	DICS		Mi70	
83	Bi	90.5259	5.00E+05	5.52E+03	3.22E+01	5.0E−01	X	T	1970	DICS		Mi70	
92	U	115.6020	9.00E+04	7.79E+02	1.80E+01	1.8E+00	X	T	1977	ICS	0.970	Is77	

Table 2
Key to references in tables: Denoted with the first two letters of the first author surname followed by the last two digits of the year of their publication. References in bold typeface correspond to publications added for the present compilation.

Key	Author(s)	Journal
Ad66	Adamczyc et al. [46]	J. Chem. Phys. 44, 4640–4642 (1966)
An96	An et al. [102]	Phys. Rev. A 54, 3067–3069 (1996).
An00	An et al. [90]	J. Phys. B 33, 3677–3684 (2000)
An03	An et al. [93]	Nucl. Instrum. Methods Phys. Res. B 207, 268–274 (2003)
An06	An et al. [107]	Nucl. Instrum. Methods Phys. Res. B 246, 281–287 (2006)
As63	Asundi and Kurepa [44]	Journal of Electronics and Control 15, 41–50 (1963)
Ay07	Aydinol [57]	Indian J. Pure Appl. Phys. 45, 641–646 (2007)
Ba15	Barros et al. [59]	J. Phys. B 48, 175201 1–12 (2015)
Be70	Berkner et al. [68]	Bull. Am . Phys. Soc. 11, 786 (1970)
Be78	Berenyi et al. [111]	
Br78	Brook et al. [50]	J. Phys. B 11, 3115–3132 (1978)
Cl35	Clark [67]	Phys. Rev. 48, 30–42 (1935)
Co72	Colliex and Jouffrey [35]	Philos. Mag. 25, 491–511 (1972)
Da72	Davis et al. [109]	Phys. Lett. A 38, 169–170 (1972)
Da75	Dangerfield et al. [54]	J. Phys. B 8, 1744 (1975)
Do62	Downey et al. [42]	*Electron Impact Studies of Gaseous Ionic Phenomena* (Thesis Ph.D.), Liverpool University, 1962)
Do70	Dolgov-Savalev and Panchenko [52]	Opt. Spectrosc. (USSR) (Engl. Transl.), 28: 578–8 (1970)
Eg75	Egerton [37]	Philos. Mag. 31, 199–215 (1975)
Fe14	Fernandez et al. [58]	J. Phys. B 47, 155201 1–9 (2014)
Fi58	Fite and Brackmann [41]	Phys. Rev. 112, 1141–1151 (1958)
Fi67	Fischer and Hoffmann [96]	Z. Phys. 204, 122–128 (1967)
Ga67	Gaudin and Hagemann [48]	J. Chim. Phys. 64, 1209–1221 (1967)
Ge82	Genz et al. [106]	Z. Phys. 305, 9–19 (1982)
Gl67	Glupe and Mehlhorn [76]	Phys. Lett. A 25, 274–275 (1967)
Gl71	Glupe and Mehlhorn [30]	Journal de Physique Colloques 32, 40–43 (1971)
Ha56	Harrison [40]	*The Experimental Determination of Ionization Cross Sections of Gases Under Electron Impact* (Thesis Ph. D., The Catholic University of America, Washington, DC., 1956)
Ha64	Hansen et al. [121]	Nucl. Phys. 58, 241–253 (1964)
Ha66	Hansen et al. [125]	Nucl. Phys. 79, 135–144 (1966)
He96a	He et al. [101]	Acta Phys. Sin. (Overseas Edition) 5, 499 (1996)
He96b	He et al. [123]	Nucl. Inst. Meth. Phys. Res. B 114 (1996) 213-216
He97	He et al. [92]	Nucl. Instrum. Methods Phys. Res. N. 129, 445–450 (1997)
Hi69	Hink and Ziegler [80]	Z. Phys. A 236, 222–234 (1969)
Hi71	Hink and Paschke [17]	Z. Phys. A 244 140–148 (1971)
Hi81	Hink et al. [31]	Inner-Shell and X-ray Physics of Atoms and Solids (Springer US, Boston, MA, 1981) p. 327–330.
Hi82	Hippler et al. [85]	Zeitschrift für Physik A Atoms and Nuclei 307, 83–87 (1982)
Hi83	Hippler et al. [86]	J. Phys. B 16, L617–L621 (1983)
Ho79	Hoffmann et al. [25]	Z. Phys. A. 293, 187–201 (1979)
Hu72	Hubner et al. [110]	Z. Phys. A. 255, 269–280 (1972)
Is72	Isaacson [36]	J. Chem. Phys. 56, 1813–1818 (1972)
Is77	Ishii et al. [69]	Phys. Rev. A 15, 906–913, 1977
Je75	Jessenberger and Hink [91]	Z. Phys. A 275, 331–337 (1975)
Ka80	Kamiya et al. [78]	Phys. Rev. A 22, 413–420 (1980)
Ki66	Kieffer and Dunn [134]	Rev. Mod. Phys. 38, 1–35 (1966)
Ki81	Kiss et al. [120]	Acta Sci. Hung. 50, 97–102 (1981)
La77	Larkins [65]	At. Data and Nucl. Data Tables 20, 313 (1977)
Li34	Liska [39]	Phys. Rev. 46, 169–176 (1934)
Li12	Limandri et al. [9]	Phys. Rev. A 86, 042701 1–10 (2012)
Li20	Li et al. [63]	Acta Phys. Sin. 69, 133401–1 (2020)
Ll00	Llovet et al. [95]	J. Phys. B 33, 3761–3772 (2000)
Ll02	Llovet et al. [100]	J. Phys. B 35, 973–982 (2002)
Lo90	Long et al. [3]	At. Data Nucl. Data Tables 45, 353–366 (1990)
Lu96	Luo et al. [94]	J. Phys. B 29, 4001–4005 (1996)
Lu97	Luo et al. [98]	J. Phys. B 30, 2681–2686 (1997)
Lu01	Luo et al. [119]	Phys. Rev. A 63, 034702 1–3 (2001)
Mc88	McDonald and Spicer [79]	Phys. Rev. A 37, 985–987 (1988)
Me04	Merlet et al. [118]	Phys. Rev. A 69, 032708 1–7 (2004)
Me06	Merlet et al. [116]	Phys. Rev. A 73, 062719 1–10 (2006)
Me16	Mei et al. [60]	J. Phys. B 49, 245204 1–6 (2016)
Mi70	Middleman et al. [108]	Phys. Rev. A 2, 1429–1443 (1970)
Mo64	Motz and Placious [66]	Phys. Rev. 136 A662–A665 (1964)
Mo84	Montague et al. [7]	J. Phys. B 17, 3295–3310 (1984)
Na80	Nagy et al. [51]	J. Phys. B 13, 1249–1267 (1980)
Pe91	Perkins et al. [21]	"Tables and graphs of atomic subshell and relaxation data derived from the LLNL Evaluated Atomic Data Library (EADL), Z = 1–100." Oct. 1991.
Pe98	Peng et al. [122]	Phys. Rev. A 58, 2034–2036 (1998)
Pe15	Perez et al. [29]	Phys. Rev. A 92, 062708 1–8 (2015)
Pl85	Platten et al. [32]	Phys. Lett. A 107, 83–86 (1985)
Po47	Pockman et al. [104]	Phys. Rev. 71, 330–338 (1947)
Qu82	Quarles and Semaan [33]	Phys. Rev. A 26, 3147–3151 (1982)

(*continued on next page*)

Table 2 (*continued*)

Key	Author(s)	Journal
Ra65	Rapp and Englander-Golden [6]	J. Chem. Phys. 43, 1464–1479 (1965)
Re66	Rester and Dance [126]	Phys. Rev. 152, 1–3 (1966)
Re02	Rejoub et al. [75]	Phys. Rev. A 65, 042713 1 (2002)
Ri77	Ricz et al. [124]	Acta Phys. Acad. Sci. Hung. 42, 269–271 (1977)
Ro62	Rothe et al. [43]	Phys. Rev. 125, 582–583 (1962)
Ro79	Rossouw and Whelan [34]	J. Phys. D 12, 797 (1979)
Sa19	Santos et al. [62]	Phys. Rev. A 100, 022703 1–9 (2019)
Sc65	Schram et al. [45]	Physica 31, 94–112 (1965)
Sc66	Schram et al. [47]	Physica 32, 734–740 (1966)
Sc72	Scholz et al. [53]	Phys. Rev. Lett. 29, 761–764 (1972)
Sc76	Schlenk et al. [127]	Acta Phys. Acad. Sci. Hung. 41,159–163 (1976)
Sc93	Schneider et al. [128]	Phys. Rev. Lett. 71, 2707–2709 (1993)
Se74	Seif et al. [105]	Z. Phys. 267, 169–174 (1974)
Sh75	Shchemelinin and Andreev	Sov. Phys. - Tech. Phys. (Engl. Transl.) 20, 941–943 (1975)
Sh80	Shima et al. [97]	Phys. Lett. A 77, 237–239 (1980)
Sh81	Shima et al. [112]	Phys. Rev. A 24, 72–78 (1981)
Sh87	Shah et al. [70]	J. Phys. B 20, 3501–3514 (1987)
Sh88	Shah et al. [74]	J. Phys. B 21, 2751–2761 (1988)
Sh91	Shevelko et al. [88]	Phys. Scr. 43, 158 (1991)
Sh92	Shyn [71]	Phys. Rev. A 45, 2951–2956 (1992)
Sh94	Shchagin et al. [81]	Nucl. Instr. Meth. Phys. Res. B 84, 9–13 (1994)
Si03	Singh and Shanker [87]	J. Phys. B 36, 3031–3042 (2003)
Sm30	Smith [38]	Phys. Rev. 36, 1293–1302 (1930)
Sm45	Smick et al. [103]	Phys. Rev. 67, 153–161 (1945)
St80	Stephan et al. [72]	J. Chem. Phys. 73, 3763–3778 (1980)
Ta99a	Tang et al. [114]	Chin. Phys. Lett. 16, 505 (1999)
Ta99b	Tang et al. [99]	Nucl. Instr. Meth. Phys. Res. B 155 1-5 (1999)
Ta02	Tang et al. [117]	J. Appl. Phys. 91, 6739–6743 (2002)
Ta73	Tawara et al. [77]	Physica 63, 351–367 (1973)
Ti20	Tian et al. [64]	Can. J. Phys. 98, 970–975 (2020)
Va16	Vanin et al. [61]	Radiat. Phys. Chem. 119, 14–23 (2016)
Wa87	Watanabe [55]	Phys. Rev. A 35, 1423–1425 (1987)
We87a	Wetzel et al. [73]	Phys. Rev. A 35, 559–577 (1987)
We87b	Westbrook and Quarles [56]	Nucl. Instr. Meth. Phys. B 24-25, 196–198 (1987)
Wu10	Wu et al. [83]	J. Phys. B 268, 2820–2824 (2010)
Wu11	Wu et al. [84]	Nucl. Inst. Meth. Phys. Res. B 269, 117–121 (2011)
Wu12	Wu et al. [89]	Can. J. Phys. 90, 125–130 (2012)
Zh01	Zhou et al. [113]	Chin. Phys. Lett. 18, 759 (2001)
Zh02	Zhou et al. [115]	J. Phys. B 35, 841–845 (2002)
Zh09	Zhu et al. [82]	Phys. Rev. A 79, 052710 1–7 (2009)