Report COO-2218-17

FUSION CROSS SECTIONS AND REACTIVITIES

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June 17, 1974

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ABSTRACT

This report summarizes cross section and reactivity data for several important fusion reactions. Reactivities are included for both Maxwellian plasmas and beam-Maxwellian target fusion. Equations, tabular and also graphical presentations are included for convenience in a variety of applications.

INTRODUCTION

With the steadily increasing research in controlled thermonuclear fusion, a need has developed for a convenient collection of both fusion cross sections and reactivities (i.e. $\langle\sigma v\rangle$ values). While such data is widely available, it is generally scattered throughout reports and books. Also forms convenient for computer use are not always included.

The material that follows presents fusion cross sections and reactivity data in both graphical and tabular form for the following reactions: $T(d,n)^4He$, $^3He(d,p)^4He$, $D(d,p)T$, $D(d,n)^3He$, $T(t,2n)^4He$, $T(^3He,X)Y^*$ and $^{11}B(p,2^4He)^4He$.

In addition to cross sections, reaction-rate parameters ($\langle\sigma v\rangle$) are given for two important cases: 1) Maxwellian distributions for both ion species, and 2) beam-Maxwellian target fusion. Also, for the first case plots of $\langle\sigma v\rangle/T^2$ are included since this is directly related to the the maximum power density for a magnetic pressure limited system.

Rather than present experimental data per se, we have elected to use fitted cross sections which are directly usable in numerical work. In the time allowed for preparation of this report we were not able

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*The following products have been considered

% Probability (225-600 keV)	X	Y
51 ± 2	p+n	^4He
43 ± 2	d	^4He
6 ± 2	p	^5He

to access the accuracy* of the fits although they are generally thought to be reasonable. Thus the cross section set presented here must be considered an unevaluated set. (The user should not be confused on this point by the computer output that typically carry more significant figures than are meaningful). Hopefully the question of accuracy can be more fully studied later. However, before this can be done in a meaningful fashion, a complete review of the basic experimental data is necessary in order to select the "best" basic data from the various measurements available. Once this is done, the adequacy of the fit can be accessed in a relatively straight forward manner.

The first six reactions (Secs. 1 through 6) were fit with a form developed by Duane[1], namely:

$$\sigma(E) = [E\{\exp(A1/\sqrt{E})-1\}]^{-1}[A2/\{1+(A3xE-A4)^2\} + A5] \qquad (1)$$

Here E refers to the energy of the incident particle (Lab System) in eV and values for the constants A1 through A5 are given in Appendix A. The cross section for the last reaction, $^{11}B(p,2\,^4He)^4He$ was obtained by fitting the cross sections as given by Jarmie and Seagrave[2] in energy segments. The exact forms used are given in Appendix B.

The average reaction-rate parameter for a Maxwellian plasma was evaluated from the expression[3]:

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*The accuracy discussed here is not that of the computer programs, which are accurate to 1 part in 10^4, but rather how well the numerical fits represent the cross sections.

1. B. H. Duane, "Fusion Cross Section Theory," BNWL-1685 (1972).

2. N. Jarmie and R. Seagrave (eds.), "Charged Particle Cross Sections," LA-2014, Los Alamos Scientific Laboratory (1957).

3. M. Clark and D. Rose, Plasmas and Controlled Fusion, M. I. T. Press, Massachusetts Institute of Technology (1965).

$$\langle\sigma v\rangle = \frac{4}{(2\pi m_1)^{1/2}} \left(\frac{\mu}{m_1 kT}\right)^{3/2} \int_0^\infty dE\ E\ \sigma(E)\ \exp\left(-\frac{\mu E}{m_1 kT}\right) \qquad (2)$$

where, T = the temperature of both species

m_1 = Mass of the ion with energy E

μ = Reduced mass of the two fusing ions

This form results from assuming that both types of ions in the plasma are Maxwellian and at the same temperature T. The corresponding quantity for the beam-target case is found by assuming that the beam particles are monoenergetic but have an isotropic angular distribution. The background plasma species are assigned a Maxwellian energy distribution at temperature T. The instantaneous reaction rate parameter for a single incident particle with speed v_o is then given by:

$$\langle\sigma v\rangle_b = \frac{\beta}{\sqrt{\pi}} \frac{1}{v_o} \int_0^\infty \sigma\left(\tfrac{1}{2} m_1 v^2\right) v^2 \left[\exp[-\beta^2(v_o-v)^2]-\exp[-\beta^2(v_o+v)^2]\right]dv \qquad (3)$$

where: $\beta^2 \equiv \frac{m_2}{2kT}$ (3a)

and the various quantities are

v_o = velocity of injected particle

m_2 = mass of background particle

m_1 = mass of incident particle

The format adopted here has separate sections for each reaction, e.g., Sec. 1 treats d-T and t-D data. For each reaction values and graphs for σ, $\langle\sigma v\rangle$, $\langle\sigma v\rangle/T^2$, and $\langle\sigma v\rangle_b$ are presented, in that order. Then, for comparison purposes, the last section contains composite graphs of σ, $\langle\sigma v\rangle$, and $\langle\sigma v\rangle_b$.

It is hoped that this tabulation will be of value to various workers in the fusion community. We plan to continue to improve and update the material and would welcome any comments. Please address any communication to G. H. Miley, Nuclear Engineering Program, U of Ill., Urbana, Illinois 61801 (Phone (217) 333-3772).

The authors wish to thank Dr. Fred H. Tenney of the Princeton Plasma Physics Laboratory for his time and comments which proved most valuable in this work.

Appendix A

Constants Used In The Fitted Cross Section of Equation 1.

Reaction	Constants
$T(d,n)^4He$	A1 = 1453 $\sqrt{eV}$
	A2 = 502 x 10^5 eV barn
	A3 = 1368 x 10^{-8}/eV
	A4 = 1.076
	A5 = 409 x 10^3 eV barn
$^3He(d,p)^4He$	A1 = 2823 $\sqrt{eV}$
	A2 = 259 x 10^5 eV barn
	A3 = 398 x 10^{-8}/eV
	A4 = 1.297
	A5 = 647 x 10^3 eV barn
$D(d,p)T$	A1 = 1457.7 $\sqrt{eV}$
	A2 = 372 x 10^3 eV barn
	A3 = 436 x 10^{-9}/eV
	A4 = 1.220
	A5 = 0
$D(d,n)^4He$	A1 = 1514 $\sqrt{eV}$
	A2 = 482 x 10^3 eV barn
	A3 = 308 x 10^{-8}/eV
	A4 = 1.177
	A5 = 0
$T(t,2n)^4He$	A1 = 1214 $\sqrt{eV}$
	A2 = 448 x 10^3 eV barn
	A3 = 102 x 10^{-8}/eV
	A4 = 2.09
	A5 = 0

$T(^3He,X)Y$

A1 = 3893 $\sqrt{eV}$

A2 = 1125 x 10^4 eV barn

A3 = 0

A4 = 0

A5 = 0

Appendix B

Parameters For the ^{11}B Reaction

The equations used for $^{11}B(p,2^4He)^4He$ are as follows:

$0 < E(keV) \leq 400 \quad \sigma^* = \frac{6.524 \times 10^{-14}}{E(eV)} \exp(-9131.5/\sqrt{E(eV)})$

$400 < E(keV) \leq 625 \quad \sigma = [(A5)E^5 + (A4)E^4 + (A3)E^3 + (A2)E^2 + (A1)E + (A0)] \times 10^{-28}$

$A5 = -.3498 \times 10^{-8}$ (E in keV)

$A4 = .8024 \times 10^{-5}$

$A3 = -.7192 \times 10^{-2}$

$A2 = .3182 \times 10^{1}$

$A1 = -.6895 \times 10^{3}$

$A0 = .5834 \times 10^{5}$

$625 < E(keV) \leq 725 \quad \sigma = \frac{A}{(E-E_r)^2+B}$ (E in keV)

$A = 46893.75 \times 10^{-24}$

$B = 76250.$

$E_r = 675$

$725 < E(keV) \leq 1175 \quad \sigma = [(A5)E^5 + (A4)E^4 + (A3)E^3 + (A2)E^2 + (A1)E + (A0)] \times 10^{-28}$

$A5 = .9567 \times 10^{-9}$ (E in keV)

$A4 = -.4861 \times 10^{-5}$

$A3 = .9729 \times 10^{-2}$

$A2 = -.9554 \times 10^{1}$

$A1 = .4578 \times 10^{4}$

$A0 = -.8480 \times 10^{6}$

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*In units of cm^2.

$1175 < E(keV) \leq 1200 \quad \sigma = .130 \times 10^{-24}$

$1200 < E(keV) \leq 1550 \quad \sigma = .135 \times 10^{-24}$

$1550 < E(keV) \leq 2000 \quad \sigma = [(A5)E^5 + (A4)E^4 + (A3)E^3 + (A2)E^2 + (A1)E + (A0)] \times 10^{-28}$

$A5 = .1291 \times 10^{-9}$ (E in keV)

$A4 = -.1106 \times 10^{-5}$

$A3 = .3784 \times 10^{-2}$

$A2 = -.6466 \times 10^{1}$

$A1 = .5518 \times 10^{4}$

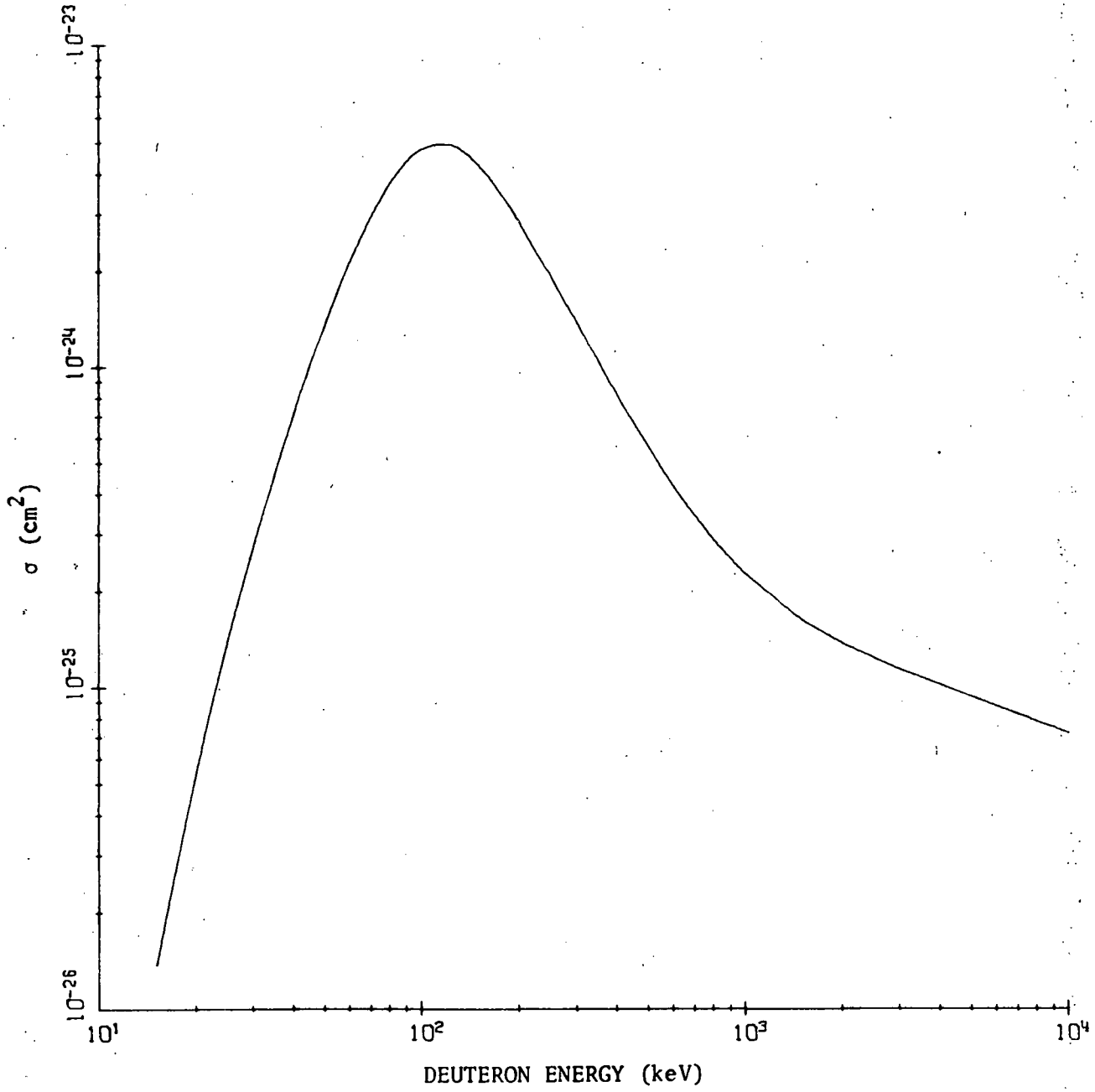
$A0 = -.1880 \times 10^{7}$

Section 1

Deuterium-Tritium Reactions

Cross Section For $T(d,n)^4He$

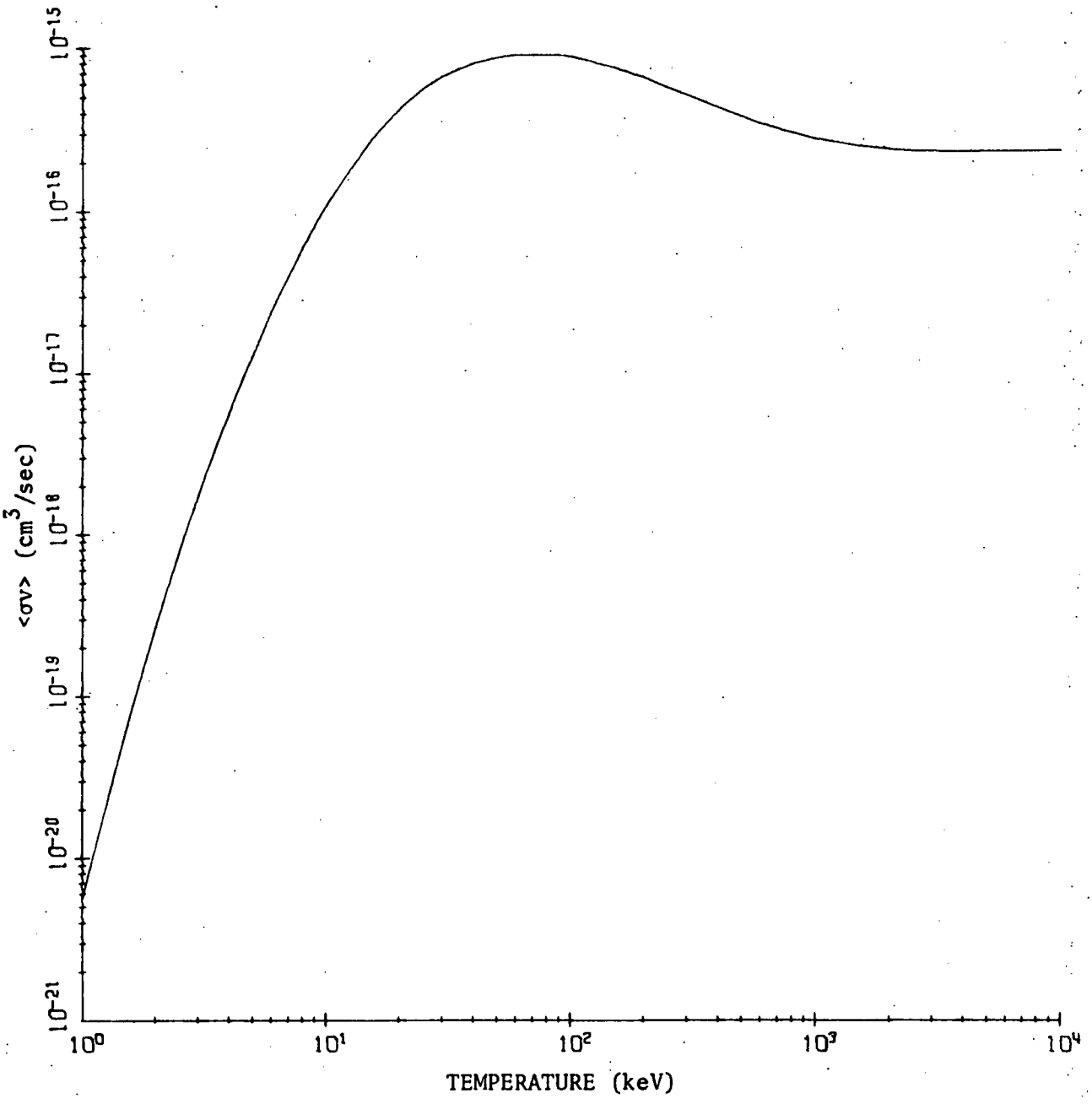
ENERGY (keV)	σ (cm^2)	ENERGY (keV)	σ (cm^2)
1.0000	0.26618D-39	1.5000	0.81996D-36
2.0000	0.94327D-34	2.5000	0.23459D-32
3.0000	0.24755D-31	3.5000	0.15285D-30
4.0000	0.65778D-30	4.5000	0.21901D-29
5.0000	0.60307D-29	5.5000	0.14362D-28
6.0000	0.30520D-28	6.5000	0.59202D-28
7.0000	0.10661D-27	7.5000	0.18051D-27
8.0000	0.29025D-27	8.5000	0.44669D-27
9.0000	0.66214D-27	9.5000	0.95016D-27
10.000	0.13255D-26	15.000	0.13595D-25
20.000	0.53401D-25	25.000	0.13492D-24
30.000	0.26683D-24	35.000	0.45303D-24
40.000	0.69377D-24	45.000	0.98634D-24
50.000	0.13253D-23	55.000	0.17027D-23
60.000	0.21081D-23	65.000	0.25287D-23
70.000	0.29502D-23	75.000	0.33578D-23
80.000	0.37370D-23	85.000	0.40752D-23
90.000	0.43625D-23	95.000	0.45927D-23
100.00	0.47633D-23	150.00	0.41866D-23
200.00	0.27813D-23	250.00	0.18836D-23
300.00	0.13506D-23	350.00	0.10202D-23
400.00	0.80432D-24	450.00	0.65650D-24
500.00	0.55125D-24	550.00	0.47382D-24
600.00	0.41527D-24	650.00	0.36995D-24
700.00	0.33416D-24	750.00	0.30540D-24
800.00	0.28193D-24	850.00	0.26251D-24
900.00	0.24625D-24	950.00	0.23248D-24
1000.0	0.22071D-24	1500.0	0.15865D-24
2000.0	0.13422D-24	2500.0	0.12072D-24
3000.0	0.11174D-24	3500.0	0.10509D-24
4000.0	0.99838D-25	4500.0	0.95496D-25
5000.0	0.91803D-25	5500.0	0.88593D-25
6000.0	0.85758D-25	6500.0	0.83222D-25
7000.0	0.80931D-25	7500.0	0.78845D-25
8000.0	0.76933D-25	8500.0	0.75169D-25
9000.0	0.73535D-25	9500.0	0.72013D-25
10000.	0.70592D-25	15000.	0.60073D-25
20000.	0.53358D-25	25000.	0.48564D-25
30000.	0.44909D-25	35000.	0.41999D-25
40000.	0.39606D-25	45000.	0.37593D-25
50000.	0.35868D-25	55000.	0.34366D-25
60000.	0.33044D-25	65000.	0.31867D-25
70000.	0.30811D-25	75000.	0.29856D-25
80000.	0.28987D-25	85000.	0.28191D-25
90000.	0.27459D-25	95000.	0.26783D-25



Cross section for $T(d,n)^4He$

<σv> For T(d,n)^{4}He assuming Maxwellian distributions

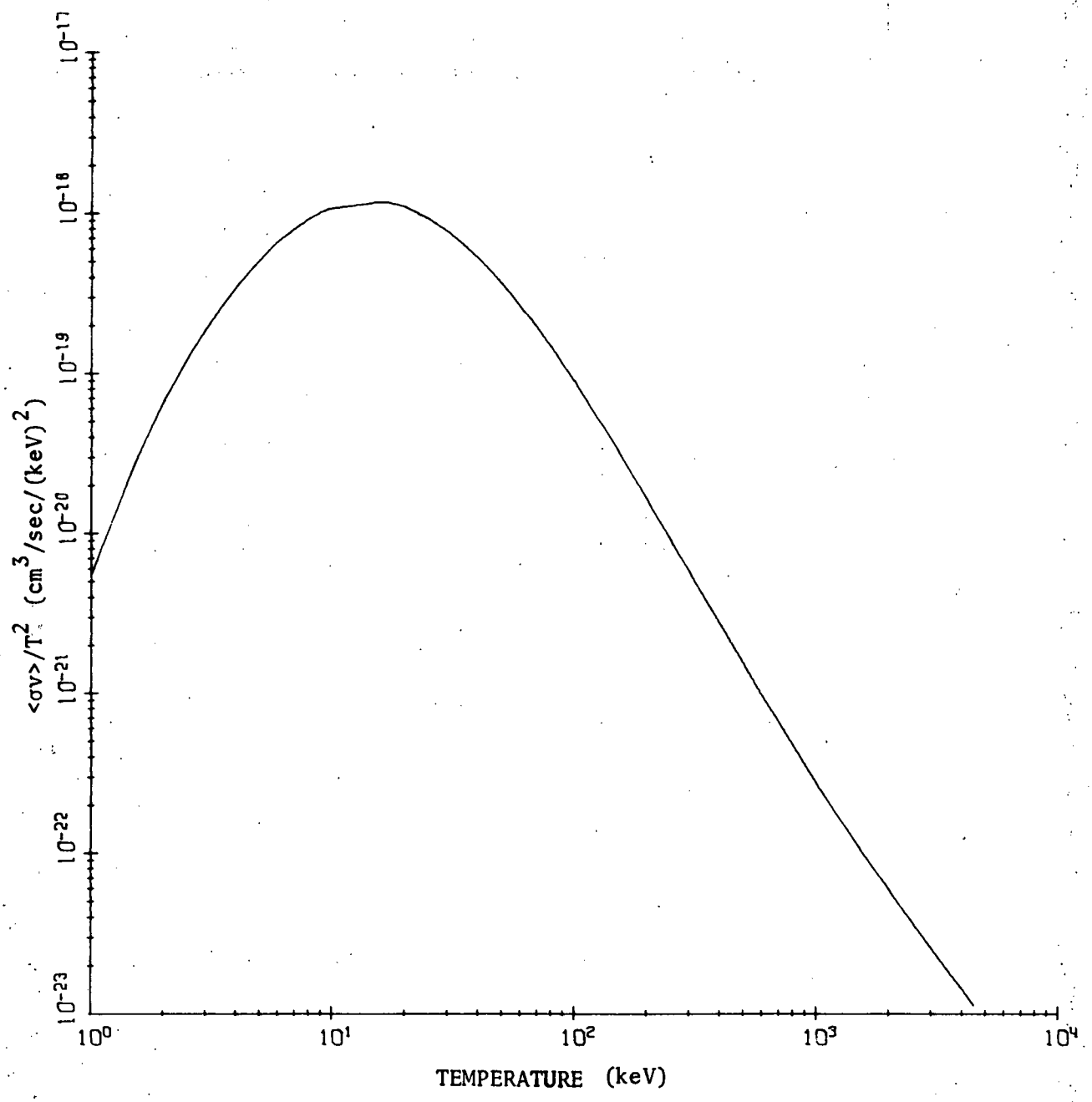
TEMP (keV)	<σv> (cm^3/sec)	TEMP (keV)	<σv> (cm^3/sec)
1.0000	0.54835D-20	1.5000	0.58917D-19
2.0000	0.26276D-18	2.5000	0.76096D-18
3.0000	0.17128D-17	3.5000	0.32740D-17
4.0000	0.55843D-17	4.5000	0.87602D-17
5.0000	0.12891D-16	5.5000	0.18039D-16
6.0000	0.24237D-16	6.5000	0.31494D-16
7.0000	0.39797D-16	7.5000	0.49111D-16
8.0000	0.59391D-16	8.5000	0.70576D-16
9.0000	0.82598D-16	9.5000	0.95385D-16
10.000	0.10886D-15	15.000	0.26542D-15
20.000	0.42434D-15	25.000	0.55940D-15
30.000	0.66532D-15	35.000	0.74479D-15
40.000	0.80252D-15	45.000	0.84312D-15
50.000	0.87050D-15	55.000	0.88775D-15
60.000	0.89729D-15	65.000	0.90097D-15
70.000	0.90022D-15	75.000	0.89612D-15
80.000	0.88951D-15	85.000	0.88103D-15
90.000	0.87117D-15	95.000	0.86033D-15
100.00	0.84879D-15	150.00	0.72770D-15
200.00	0.62783D-15	250.00	0.55246D-15
300.00	0.49542D-15	350.00	0.45147D-15
400.00	0.41692D-15	450.00	0.38927D-15
500.00	0.36679D-15	550.00	0.34826D-15
600.00	0.33280D-15	650.00	0.31977D-15
700.00	0.30867D-15	750.00	0.29916D-15
800.00	0.29094D-15	850.00	0.28379D-15
900.00	0.27754D-15	950.00	0.27204D-15
1000.0	0.26719D-15	1500.0	0.23954D-15
2000.0	0.22907D-15	2500.0	0.22470D-15
3000.0	0.22296D-15	3500.0	0.22249D-15
4000.0	0.22266D-15	4500.0	0.22319D-15
5000.0	0.22390D-15	5500.0	0.22471D-15
6000.0	0.22556D-15	6500.0	0.22642D-15
7000.0	0.22727D-15	7500.0	0.22811D-15
8000.0	0.22892D-15	8500.0	0.22971D-15
9000.0	0.23047D-15	9500.0	0.23120D-15
10000.	0.23191D-15	15000.	0.23757D-15
20000.	0.24154D-15	25000.	0.24450D-15
30000.	0.24679D-15	35000.	0.24862D-15
40000.	0.25013D-15	45000.	0.25140D-15
50000.	0.25250D-15	55000.	0.25346D-15
60000.	0.25431D-15	65000.	0.25507D-15
70000.	0.25576D-15	75000.	0.25638D-15
80000.	0.25694D-15	85000.	0.25746D-15
90000.	0.25794D-15	95000.	0.25838D-15



Values of <σv> assuming Maxwellian distributions for D-T fusion reactions

$\langle\sigma v\rangle/T^2$ For $T(d,n)^4He$ assuming Maxwellian distributions

TEMP (keV)	$\langle\sigma v\rangle/T^2$ ($cm^3/sec/(keV)^2$)	TEMP (keV)	$\langle\sigma v\rangle/T^2$ ($cm^3/sec/(keV)^2$)
1.0000	0.54835D-20	1.5000	0.26185D-19
2.0000	0.65690D-19	2.5000	0.12175D-18
3.0000	0.19032D-18	3.5000	0.26727D-18
4.0000	0.34902D-18	4.5000	0.43260D-18
5.0000	0.51565D-18	5.5000	0.59633D-18
6.0000	0.67326D-18	6.5000	0.74543D-18
7.0000	0.81218D-18	7.5000	0.87309D-18
8.0000	0.92798D-18	8.5000	0.97683D-18
9.0000	0.10197D-17	9.5000	0.10569D-17
10.000	0.10886D-17	15.000	0.11796D-17
20.000	0.10609D-17	25.000	0.89504D-18
30.000	0.73925D-18	35.000	0.60799D-18
40.000	0.50157D-18	45.000	0.41636D-18
50.000	0.34820D-18	55.000	0.29347D-18
60.000	0.24925D-18	65.000	0.21325D-18
70.000	0.18372D-18	75.000	0.15931D-18
80.000	0.13899D-18	85.000	0.12194D-18
90.000	0.10755D-18	95.000	0.95327D-19
100.00	0.84879D-19	150.00	0.32342D-19
200.00	0.15696D-19	250.00	0.88394D-20
300.00	0.55047D-20	350.00	0.36854D-20
400.00	0.26057D-20	450.00	0.19223D-20
500.00	0.14672D-20	550.00	0.11513D-20
600.00	0.92445D-21	650.00	0.75684D-21
700.00	0.62995D-21	750.00	0.53184D-21
800.00	0.45459D-21	850.00	0.39279D-21
900.00	0.34264D-21	950.00	0.30143D-21
1000.0	0.26719D-21	1500.0	0.10646D-21
2000.0	0.57269D-22	2500.0	0.35953D-22
3000.0	0.24773D-22	3500.0	0.18162D-22
4000.0	0.13917D-22	4500.0	0.11022D-22
5000.0	0.89561D-23	5500.0	0.74284D-23
6000.0	0.62655D-23	6500.0	0.53590D-23
7000.0	0.46382D-23	7500.0	0.40553D-23
8000.0	0.35769D-23	8500.0	0.31794D-23
9000.0	0.28453D-23	9500.0	0.25618D-23
10000.	0.23191D-23	15000.	0.10559D-23
20000.	0.60385D-24	25000.	0.39120D-24
30000.	0.27421D-24	35000.	0.20295D-24
40000.	0.15633D-24	45000.	0.12415D-24
50000.	0.10100D-24	55000.	0.83789D-25
60000.	0.70642D-25	65000.	0.60372D-25
70000.	0.52195D-25	75000.	0.45578D-25
80000.	0.40147D-25	85000.	0.35634D-25
90000.	0.31844D-25	95000.	0.28629D-25



Values of $\langle\sigma v\rangle/T^2$ assuming Maxwellian distributions for D-T reactions

$\langle\sigma v\rangle_b$ For $T(d,n)^4He$ assuming beam - Maxwellian distributions

Tritium Temperature = 0

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.12971D-18	15.000	0.16294D-17
20.000	0.73905D-17	25.000	0.20876D-16
30.000	0.45227D-16	35.000	0.82942D-16
40.000	0.13579D-15	45.000	0.20476D-15
50.000	0.29001D-15	55.000	0.39079D-15
60.000	0.50533D-15	65.000	0.63090D-15
70.000	0.76386D-15	75.000	0.89991D-15
80.000	0.10344D-14	85.000	0.11627D-14
90.000	0.12808D-14	95.000	0.13853D-14
100.00	0.14741D-14	110.00	0.16008D-14
120.00	0.16626D-14	130.00	0.16713D-14
140.00	0.16415D-14	150.00	0.15868D-14
160.00	0.15179D-14	170.00	0.14424D-14
180.00	0.13653D-14	190.00	0.12896D-14
200.00	0.12172D-14	250.00	0.92166D-15
300.00	0.72391D-15	350.00	0.59064D-15
400.00	0.49781D-15	450.00	0.43098D-15
500.00	0.38146D-15	550.00	0.34388D-15
600.00	0.31478D-15	650.00	0.29188D-15
700.00	0.27360D-15	750.00	0.25882D-15
800.00	0.24677D-15	850.00	0.23684D-15
900.00	0.22861D-15	950.00	0.22175D-15
1000.0	0.21559D-15	1100.0	0.20703D-15
1200.0	0.20060D-15	1300.0	0.19594D-15
1400.0	0.19257D-15	1500.0	0.19015D-15
1600.0	0.18843D-15	1700.0	0.18724D-15
1800.0	0.18645D-15	1900.0	0.18599D-15
2000.0	0.18576D-15		

$\langle\sigma v\rangle_b$ For T(d,n)^{4}He assuming beam - Maxwellian distributions

Tritium Temperature = 10 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.45977D-16	15.000	0.81436D-16
20.000	0.12750D-15	25.000	0.18376D-15
30.000	0.24937D-15	35.000	0.32305D-15
40.000	0.40328D-15	45.000	0.48834D-15
50.000	0.57643D-15	55.000	0.66576D-15
60.000	0.75461D-15	65.000	0.84141D-15
70.000	0.92474D-15	75.000	0.10034D-14
80.000	0.10765D-14	85.000	0.11432D-14
90.000	0.12030D-14	95.000	0.12556D-14
100.00	0.13008D-14	110.00	0.13695D-14
120.00	0.14106D-14	130.00	0.14275D-14
140.00	0.14238D-14	150.00	0.14038D-14
160.00	0.13713D-14	170.00	0.13299D-14
180.00	0.12825D-14	190.00	0.12315D-14
200.00	0.11789D-14	250.00	0.93044D-15
300.00	0.74024D-15	350.00	0.60533D-15
400.00	0.50962D-15	450.00	0.44030D-15
500.00	0.38896D-15	550.00	0.34983D-15
600.00	0.31564D-15	650.00	0.29590D-15
700.00	0.27697D-15	750.00	0.26168D-15
800.00	0.24921D-15	850.00	0.23896D-15
900.00	0.23046D-15	950.00	0.22336D-15
1000.0	0.21742D-15	1100.0	0.20817D-15
1200.0	0.20152D-15	1300.0	0.19671D-15
1400.0	0.19321D-15	1500.0	0.19069D-15
1600.0	0.18890D-15	1700.0	0.18765D-15
1800.0	0.18681D-15	1900.0	0.18630D-15
2000.0	0.18605D-15		

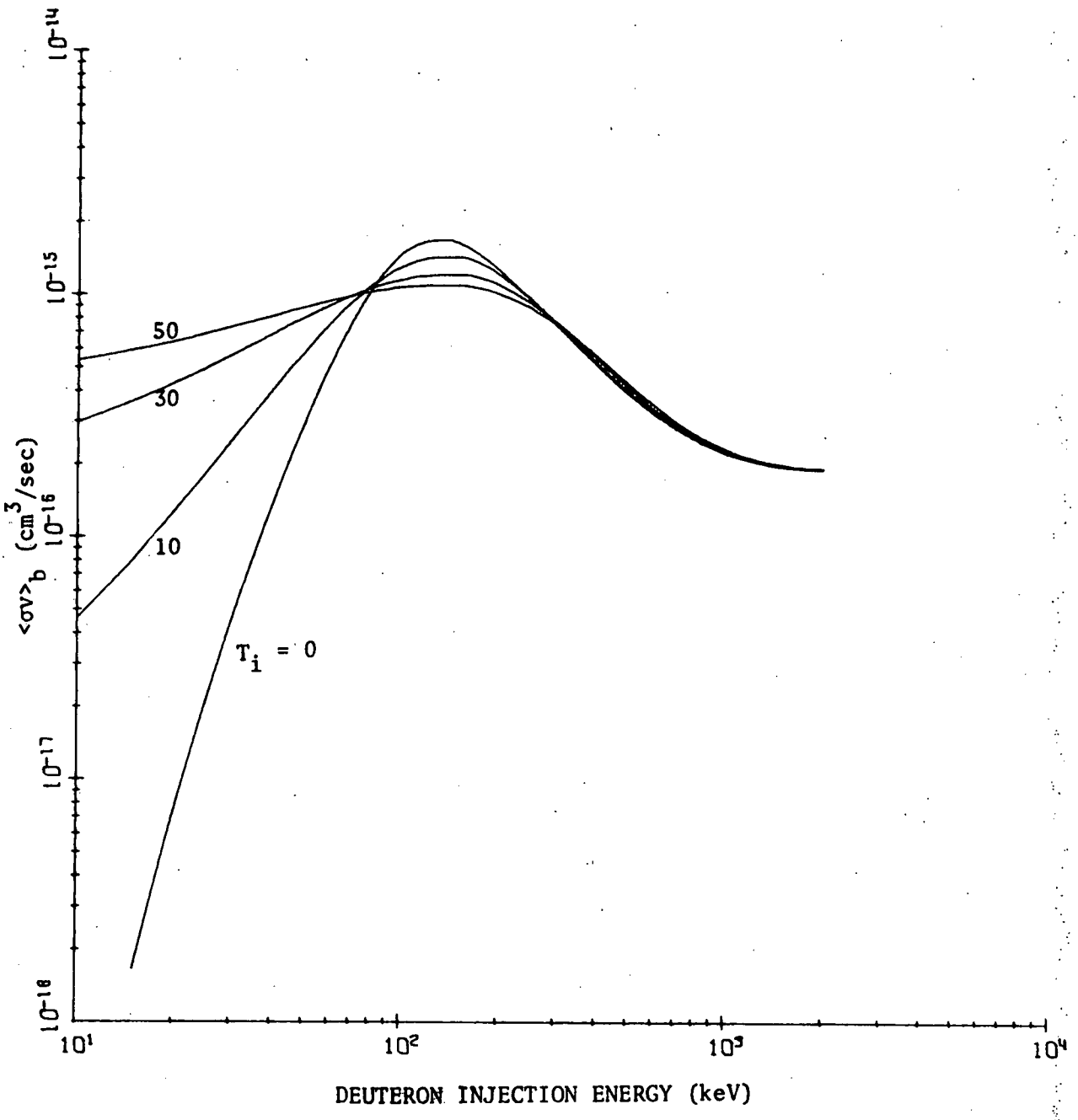
$\langle\sigma v\rangle_b$ For $T(d,n)^4He$ assuming beam - Maxwellian distributions

Tritium Temperature = 30 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.29822D-15	15.000	0.36507D-15
20.000	0.43205D-15	25.000	0.49841D-15
30.000	0.56346D-15	35.000	0.62664D-15
40.000	0.68745D-15	45.000	0.74548D-15
50.000	0.80041D-15	55.000	0.85199D-15
60.000	0.90003D-15	65.000	0.94441D-15
70.000	0.98505D-15	75.000	0.10219D-14
80.000	0.10551D-14	85.000	0.10845D-14
90.000	0.11103D-14	95.000	0.11326D-14
100.00	0.11515D-14	110.00	0.11798D-14
120.00	0.11963D-14	130.00	0.12025D-14
140.00	0.11998D-14	150.00	0.11896D-14
160.00	0.11731D-14	170.00	0.11515D-14
180.00	0.11259D-14	190.00	0.10973D-14
200.00	0.10665D-14	250.00	0.90086D-15
300.00	0.74828D-15	350.00	0.62489D-15
400.00	0.53008D-15	450.00	0.45833D-15
500.00	0.40391D-15	550.00	0.36220D-15
600.00	0.32982D-15	650.00	0.30433D-15
700.00	0.28401D-15	750.00	0.26763D-15
800.00	0.25428D-15	850.00	0.24332D-15
900.00	0.23422D-15	950.00	0.22666D-15
1000.0	0.22031D-15	1100.0	0.21045D-15
1200.0	0.20335D-15	1300.0	0.19820D-15
1400.0	0.19445D-15	1500.0	0.19173D-15
1600.0	0.18978D-15	1700.0	0.18840D-15
1800.0	0.18746D-15	1900.0	0.18687D-15
2000.0	0.18654D-15		

$\langle\sigma v\rangle_b$ For $T(d,n)^4He$ assuming beam - Maxwellian distributions
Tritium Temperature = 50 keV

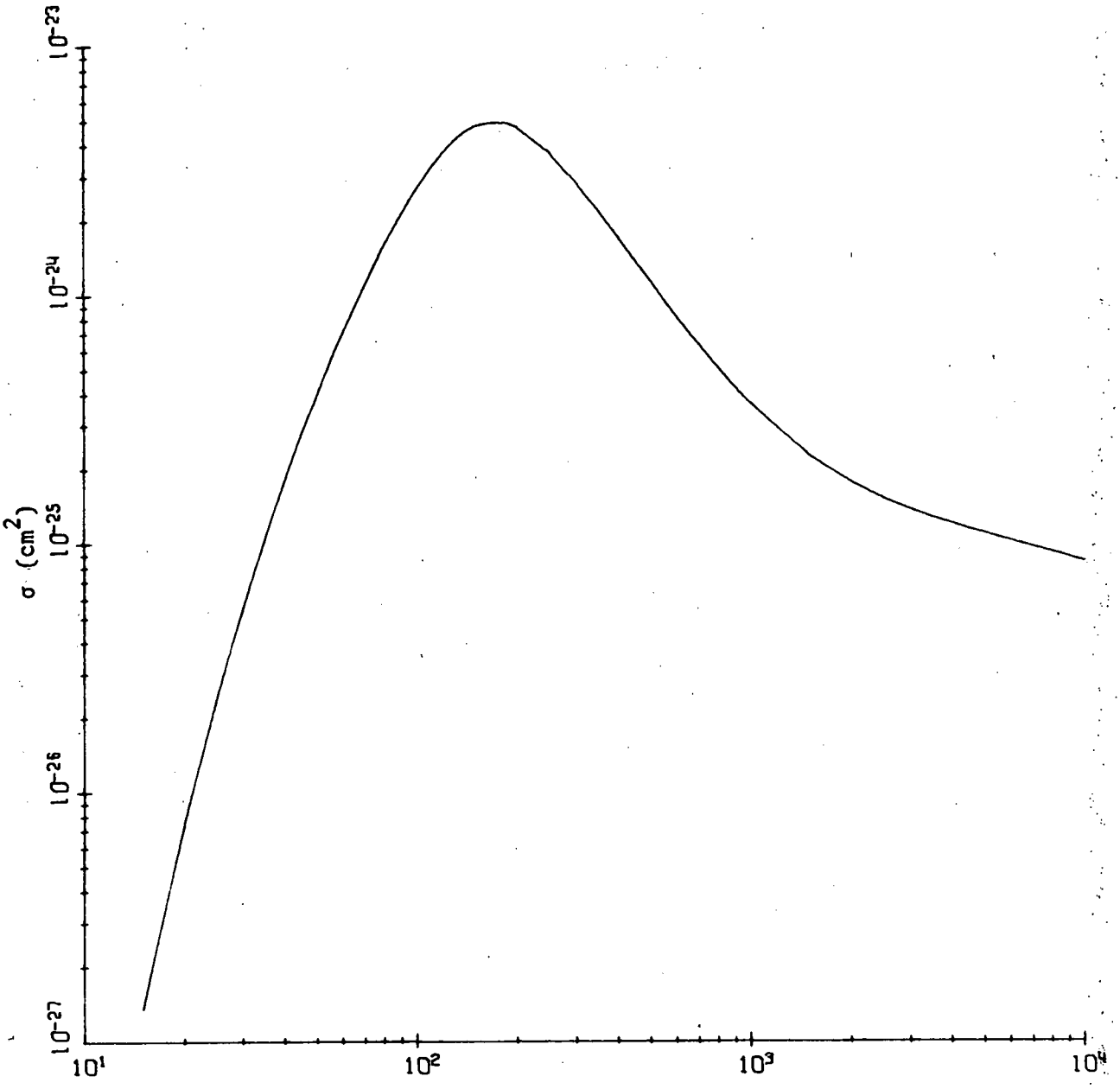
ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.53899D-15	15.000	0.59193D-15
20.000	0.64203D-15	25.000	0.68924D-15
30.000	0.73352D-15	35.000	0.77485D-15
40.000	0.81326D-15	45.000	0.84877D-15
50.000	0.88143D-15	55.000	0.91128D-15
60.000	0.93841D-15	65.000	0.96289D-15
70.000	0.98480D-15	75.000	0.10043D-14
80.000	0.10213D-14	85.000	0.10361D-14
90.000	0.10488D-14	95.000	0.10594D-14
100.00	0.10680D-14	110.00	0.10798D-14
120.00	0.10850D-14	130.00	0.10845D-14
140.00	0.10790D-14	150.00	0.10693D-14
160.00	0.10559D-14	170.00	0.10395D-14
180.00	0.10206D-14	190.00	0.99980D-15
200.00	0.97746D-15	250.00	0.85466D-15
300.00	0.73367D-15	350.00	0.62811D-15
400.00	0.54129D-15	450.00	0.47195D-15
500.00	0.41725D-15	550.00	0.37421D-15
600.00	0.34021D-15	650.00	0.31319D-15
700.00	0.29154D-15	750.00	0.27403D-15
800.00	0.25975D-15	850.00	0.24801D-15
900.00	0.23830D-15	950.00	0.23020D-15
1000.0	0.22342D-15	1100.0	0.21287D-15
1200.0	0.20529D-15	1300.0	0.19977D-15
1400.0	0.19575D-15	1500.0	0.19282D-15
1600.0	0.19069D-15	1700.0	0.18919D-15
1800.0	0.18814D-15	1900.0	0.18746D-15
2000.0	0.18706D-15		



Values of $\langle\sigma v\rangle_b$ for injection of deuterium into a tritium background at various temperatures (keV)

Cross Section For $D(t,n)^4He$

ENERGY (keV)	σ (cm^2)	ENERGY (keV)	σ (cm^2)
1.0000	0.13630D-43	1.5000	0.27626D-39
2.0000	0.97614D-37	2.5000	0.52175D-35
3.0000	0.96793D-34	3.5000	0.92611D-33
4.0000	0.56705D-32	4.5000	0.25275D-31
5.0000	0.89044D-31	5.5000	0.26204D-30
6.0000	0.66961D-30	6.5000	0.15279D-29
7.0000	0.31789D-29	7.5000	0.61266D-29
8.0000	0.11073D-28	8.5000	0.18953D-28
9.0000	0.30959D-28	9.5000	0.48569D-28
10.000	0.73559D-28	15.000	0.13399D-26
20.000	0.73503D-26	25.000	0.23186D-25
30.000	0.53800D-25	35.000	0.10317D-24
40.000	0.17412D-24	45.000	0.26844D-24
50.000	0.38706D-24	55.000	0.53018D-24
60.000	0.69740D-24	65.000	0.88776D-24
70.000	0.10998D-23	75.000	0.13314D-23
80.000	0.15802D-23	85.000	0.18430D-23
90.000	0.21165D-23	95.000	0.23967D-23
100.00	0.26794D-23	150.00	0.47681D-23
200.00	0.46537D-23	250.00	0.36659D-23
300.00	0.27735D-23	350.00	0.21254D-23
400.00	0.16701D-23	450.00	0.13464D-23
500.00	0.11110D-23	550.00	0.93557D-24
600.00	0.80194D-24	650.00	0.69805D-24
700.00	0.61584D-24	750.00	0.54974D-24
800.00	0.49585D-24	850.00	0.45137D-24
900.00	0.41423D-24	950.00	0.38291D-24
1000.0	0.35627D-24	1500.0	0.22034D-24
2000.0	0.17208D-24	2500.0	0.14833D-24
3000.0	0.13411D-24	3500.0	0.12444D-24
4000.0	0.11729D-24	4500.0	0.11166D-24
5000.0	0.10705D-24	5500.0	0.10315D-24
6000.0	0.99773D-25	6500.0	0.96799D-25
7000.0	0.94143D-25	7500.0	0.91745D-25
8000.0	0.89560D-25	8500.0	0.87555D-25
9000.0	0.85703D-25	9500.0	0.83984D-25
10000.	0.82381D-25	15000.	0.70545D-25
20000.	0.62957D-25	25000.	0.57503D-25
30000.	0.53320D-25	35000.	0.49972D-25
40000.	0.47210D-25	45000.	0.44877D-25
50000.	0.42871D-25	55000.	0.41121D-25
60000.	0.39577D-25	65000.	0.38200D-25
70000.	0.36962D-25	75000.	0.35841D-25
80000.	0.34818D-25	85000.	0.33882D-25
90000.	0.33019D-25	95000.	0.32220D-25



Cross section for $D(t,n)^4He$

$\langle\sigma v\rangle_b$ For $D(t,n)^4He$ assuming beam - Maxwellian distributions

Deuterium Temperature = 0

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.58826D-20	15.000	0.13123D-18
20.000	0.83129D-18	25.000	0.29317D-17
30.000	0.74520D-17	35.000	0.15435D-16
40.000	0.27849D-16	45.000	0.45540D-16
50.000	0.69214D-16	55.000	0.99434D-16
60.000	0.13661D-15	65.000	0.18100D-15
70.000	0.23269D-15	75.000	0.29159D-15
80.000	0.35742D-15	85.000	0.42971D-15
90.000	0.50778D-15	95.000	0.59076D-15
100.00	0.67759D-15	110.00	0.85788D-15
120.00	0.10380D-14	130.00	0.12069D-14
140.00	0.13553D-14	150.00	0.14768D-14
160.00	0.15682D-14	170.00	0.16295D-14
180.00	0.16633D-14	190.00	0.16734D-14
200.00	0.16643D-14	250.00	0.14658D-14
300.00	0.12149D-14	350.00	0.10056D-14
400.00	0.84469D-15	450.00	0.72228D-15
500.00	0.62823D-15	550.00	0.55487D-15
600.00	0.49676D-15	650.00	0.45007D-15
700.00	0.41205D-15	750.00	0.38073D-15
800.00	0.35467D-15	850.00	0.33279D-15
900.00	0.31426D-15	950.00	0.29847D-15
1000.0	0.28491D-15	1100.0	0.26306D-15
1200.0	0.24647D-15	1300.0	0.23368D-15
1400.0	0.22369D-15	1500.0	0.21581D-15
1600.0	0.20954D-15	1700.0	0.20452D-15
1800.0	0.20049D-15	1900.0	0.19724D-15
2000.0	0.19462D-15		

$\langle\sigma v\rangle_b$ For D(t,n)^{4}He assuming beam-Maxwellian distributions

Deuterium Temperature = 10 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.69057D-16	15.000	0.98042D-16
20.000	0.13112D-15	25.000	0.16801D-15
30.000	0.20837D-15	35.000	0.25182D-15
40.000	0.29796D-15	45.000	0.34636D-15
50.000	0.39655D-15	55.000	0.44821D-15
60.000	0.50078D-15	65.000	0.55390D-15
70.000	0.60714D-15	75.000	0.66014D-15
80.000	0.71254D-15	85.000	0.76400D-15
90.000	0.81422D-15	95.000	0.86295D-15
100.00	0.90992D-15	110.00	0.99786D-15
120.00	0.10767D-14	130.00	0.11457D-14
140.00	0.12044D-14	150.00	0.12527D-14
160.00	0.12909D-14	170.00	0.13193D-14
180.00	0.13387D-14	190.00	0.13498D-14
200.00	0.13534D-14	250.00	0.12878D-14
300.00	0.11490D-14	350.00	0.99704D-15
400.00	0.85931D-15	450.00	0.74386D-15
500.00	0.65015D-15	550.00	0.57483D-15
600.00	0.51420D-15	650.00	0.46508D-15
700.00	0.42494D-15	750.00	0.39183D-15
800.00	0.36427D-15	850.00	0.34113D-15
900.00	0.32156D-15	950.00	0.30488D-15
1000.0	0.29059D-15	1100.0	0.26757D-15
1200.0	0.25013D-15	1300.0	0.23669D-15
1400.0	0.22620D-15	1500.0	0.21793D-15
1600.0	0.21135D-15	1700.0	0.20609D-15
1800.0	0.20185D-15	1900.0	0.19843D-15
2000.0	0.19567D-15		

$\langle\sigma v\rangle_b$ For D(t,n)^{4}He assuming beam-Maxwellian distribution

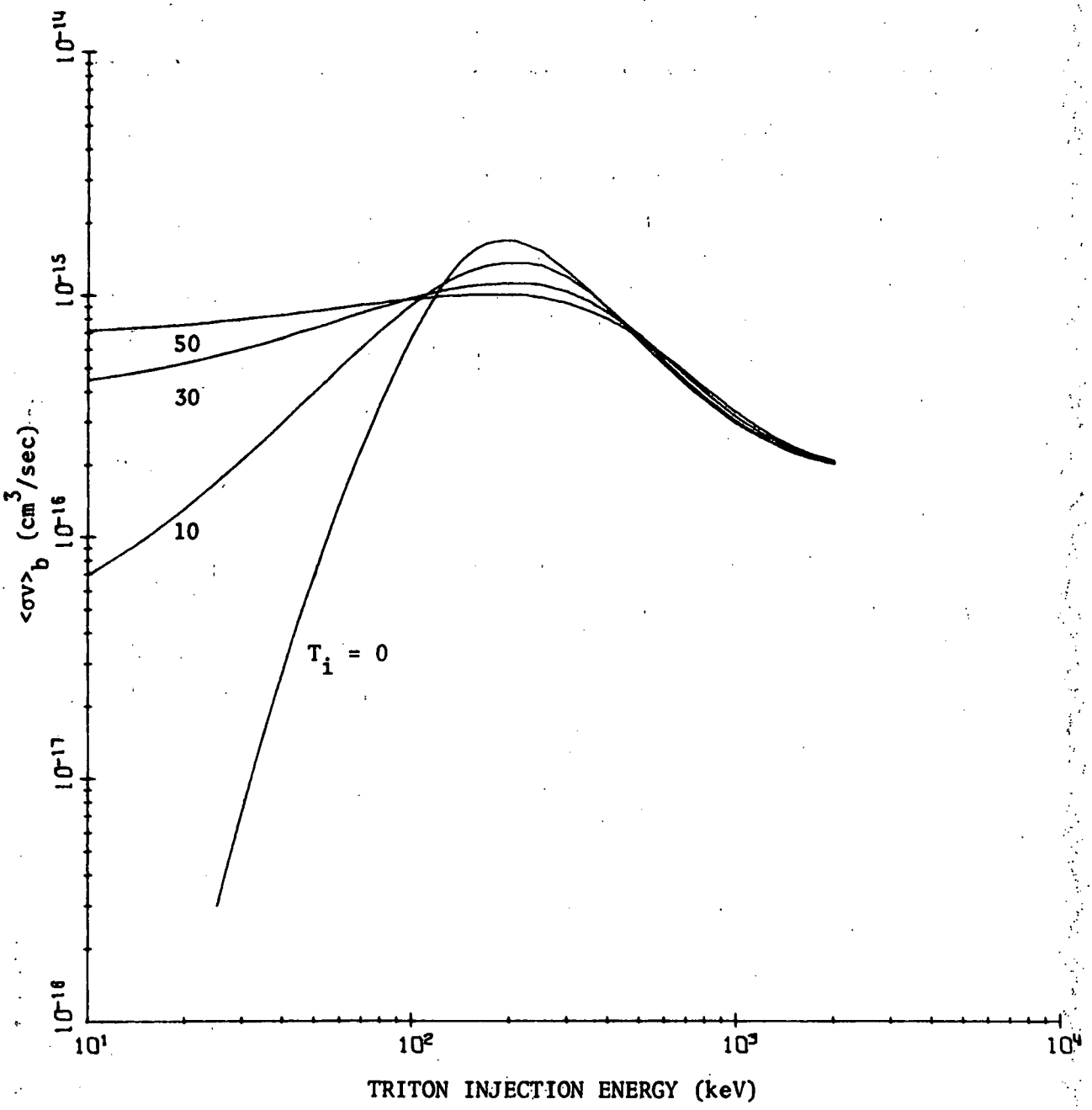
Deuterium Temperature = 30 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.44520D-15	15.000	0.48508D-15
20.000	0.52396D-15	25.000	0.56157D-15
30.000	0.59806D-15	35.000	0.63331D-15
40.000	0.66728D-15	45.000	0.69996D-15
50.000	0.73129D-15	55.000	0.76129D-15
60.000	0.78994D-15	65.000	0.81722D-15
70.000	0.84314D-15	75.000	0.86771D-15
80.000	0.89093D-15	85.000	0.91282D-15
90.000	0.93339D-15	95.000	0.95266D-15
100.00	0.97065D-15	110.00	0.10029D-14
120.00	0.10303D-14	130.00	0.10532D-14
140.00	0.10718D-14	150.00	0.10864D-14
160.00	0.10972D-14	170.00	0.11045D-14
180.00	0.11086D-14	190.00	0.11098D-14
200.00	0.11083D-14	250.00	0.10693D-14
300.00	0.99677D-15	350.00	0.90995D-15
400.00	0.82113D-15	450.00	0.73726D-15
500.00	0.66164D-15	550.00	0.59537D-15
600.00	0.53830D-15	650.00	0.48963D-15
700.00	0.44834D-15	750.00	0.41336D-15
800.00	0.38370D-15	850.00	0.35850D-15
900.00	0.33701D-15	950.00	0.31862D-15
1000.0	0.30280D-15	1100.0	0.27731D-15
1200.0	0.25798D-15	1300.0	0.24312D-15
1400.0	0.23153D-15	1500.0	0.22240D-15
1600.0	0.21515D-15	1700.0	0.20933D-15
1800.0	0.20466D-15	1900.0	0.20088D-15
2000.0	0.19782D-15		

$\langle\sigma v\rangle_b$ For D(t,n)^{4}He assuming beam-Maxwellian distributions

Deuterium Temperature = 50 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.71200D-15	15.000	0.73381D-15
20.000	0.75455D-15	25.000	0.77425D-15
30.000	0.79292D-15	35.000	0.81060D-15
40.000	0.82731D-15	45.000	0.84307D-15
50.000	0.85791D-15	55.000	0.87184D-15
60.000	0.88491D-15	65.000	0.89713D-15
70.000	0.90852D-15	75.000	0.91911D-15
80.000	0.92893D-15	85.000	0.93799D-15
90.000	0.94633D-15	95.000	0.95396D-15
100.00	0.96091D-15	110.00	0.97285D-15
120.00	0.98234D-15	130.00	0.98954D-15
140.00	0.99462D-15	150.00	0.99773D-15
160.00	0.99904D-15	170.00	0.99868D-15
180.00	0.99680D-15	190.00	0.99352D-15
200.00	0.98897D-15	250.00	0.95106D-15
300.00	0.89634D-15	350.00	0.83356D-15
400.00	0.76867D-15	450.00	0.70544D-15
500.00	0.64609D-15	550.00	0.59178D-15
600.00	0.54294D-15	650.00	0.49956D-15
700.00	0.46134D-15	750.00	0.42788D-15
800.00	0.39867D-15	850.00	0.37324D-15
900.00	0.35111D-15	950.00	0.33184D-15
1000.0	0.31505D-15	1100.0	0.28759D-15
1200.0	0.26652D-15	1300.0	0.25019D-15
1400.0	0.23742D-15	1500.0	0.22735D-15
1600.0	0.21933D-15	1700.0	0.21290D-15
1800.0	0.20773D-15	1900.0	0.20354D-15
2000.0	0.20014D-15		



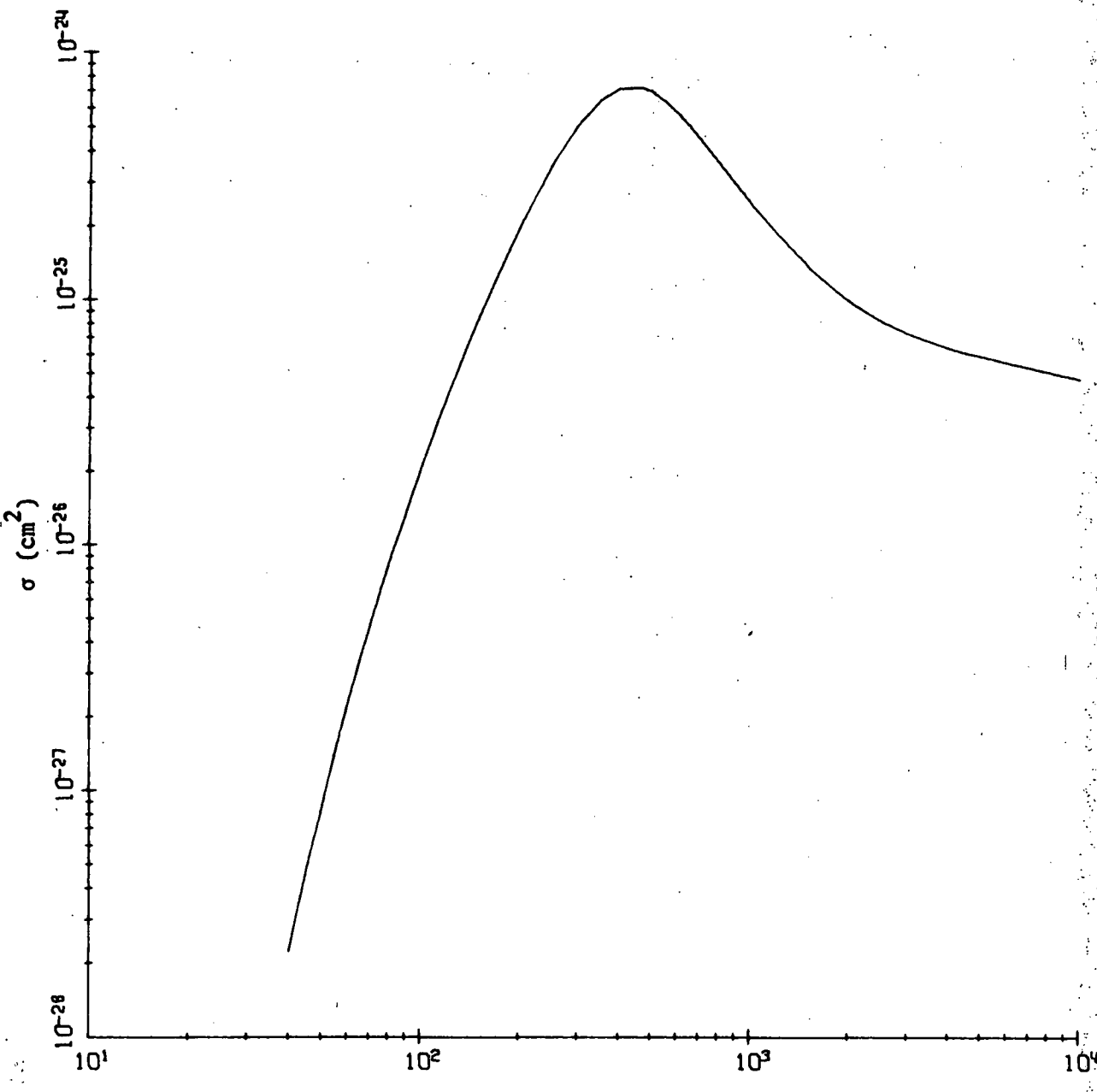
Values of $\langle\sigma v\rangle_b$ for injection of tritium into a deuterium background at various temperatures (keV)

Section 2

Deuterium-Helium-3 Reactions

Cross Section For $^{3}He(d,p)^{4}He$

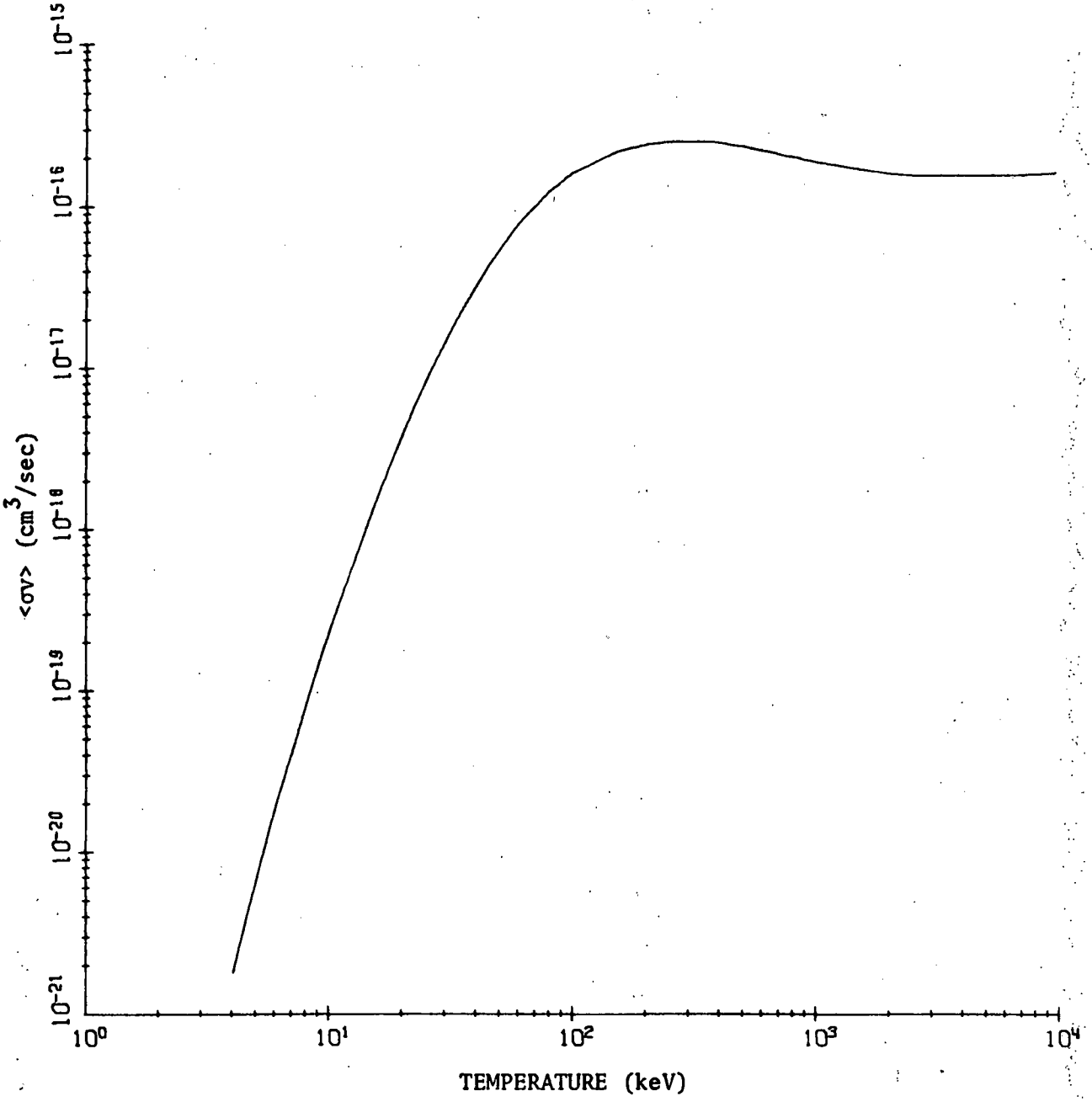
ENERGY (keV)	σ (cm^2)	ENERGY (keV)	σ (cm^2)
1.0000	0.17563D-58	1.5000	0.15265D-51
2.0000	0.19980D-47	2.5000	0.12551D-44
3.0000	0.14346D-42	3.5000	0.56363D-41
4.0000	0.10770D-39	4.5000	0.12317D-38
5.0000	0.96252D-38	5.5000	0.56194D-37
6.0000	0.26091D-36	6.5000	0.10080D-35
7.0000	0.33513D-35	7.5000	0.98384D-35
8.0000	0.26015D-34	8.5000	0.62943D-34
9.0000	0.14112D-33	9.5000	0.29619D-33
10.000	0.58693D-33	15.000	0.70827D-31
20.000	0.11868D-29	25.000	0.79558D-29
30.000	0.31999D-28	35.000	0.93610D-28
40.000	0.22114D-27	45.000	0.44898D-27
50.000	0.81508D-27	55.000	0.13587D-26
60.000	0.21188D-26	65.000	0.31325D-26
70.000	0.44346D-26	75.000	0.60569D-26
80.000	0.80282D-26	85.000	0.10374D-25
90.000	0.13118D-25	95.000	0.16279D-25
100.00	0.19875D-25	150.00	0.82156D-25
200.00	0.19396D-24	250.00	0.34566D-24
300.00	0.50881D-24	350.00	0.64182D-24
400.00	0.71313D-24	450.00	0.72014D-24
500.00	0.68235D-24	550.00	0.62284D-24
600.00	0.55784D-24	650.00	0.49594D-24
700.00	0.44063D-24	750.00	0.39269D-24
800.00	0.35173D-24	850.00	0.31690D-24
900.00	0.28729D-24	950.00	0.26206D-24
1000.0	0.24048D-24	1500.0	0.13159D-24
2000.0	0.95707D-25	2500.0	0.79672D-25
3000.0	0.70974D-25	3500.0	0.65569D-25
4000.0	0.61858D-25	4500.0	0.59109D-25
5000.0	0.56951D-25	5500.0	0.55182D-25
6000.0	0.53683D-25	6500.0	0.52380D-25
7000.0	0.51224D-25	7500.0	0.50183D-25
8000.0	0.49234D-25	8500.0	0.48361D-25
9000.0	0.47552D-25	9500.0	0.46796D-25
10000.	0.46087D-25	15000.	0.40678D-25
20000.	0.37004D-25	25000.	0.34251D-25
30000.	0.32075D-25	35000.	0.30293D-25
40000.	0.28796D-25	45000.	0.27514D-25
50000.	0.26399D-25	55000.	0.25416D-25
60000.	0.24541D-25	65000.	0.23755D-25
70000.	0.23043D-25	75000.	0.22395D-25
80000.	0.21801D-25	85000.	0.21255D-25
90000.	0.20749D-25	95000.	0.20279D-25



Cross section for $^3He(d,p)^4He$

<σv> For $^{3}He(d,p)^{4}He$ assuming Maxwellian distributions

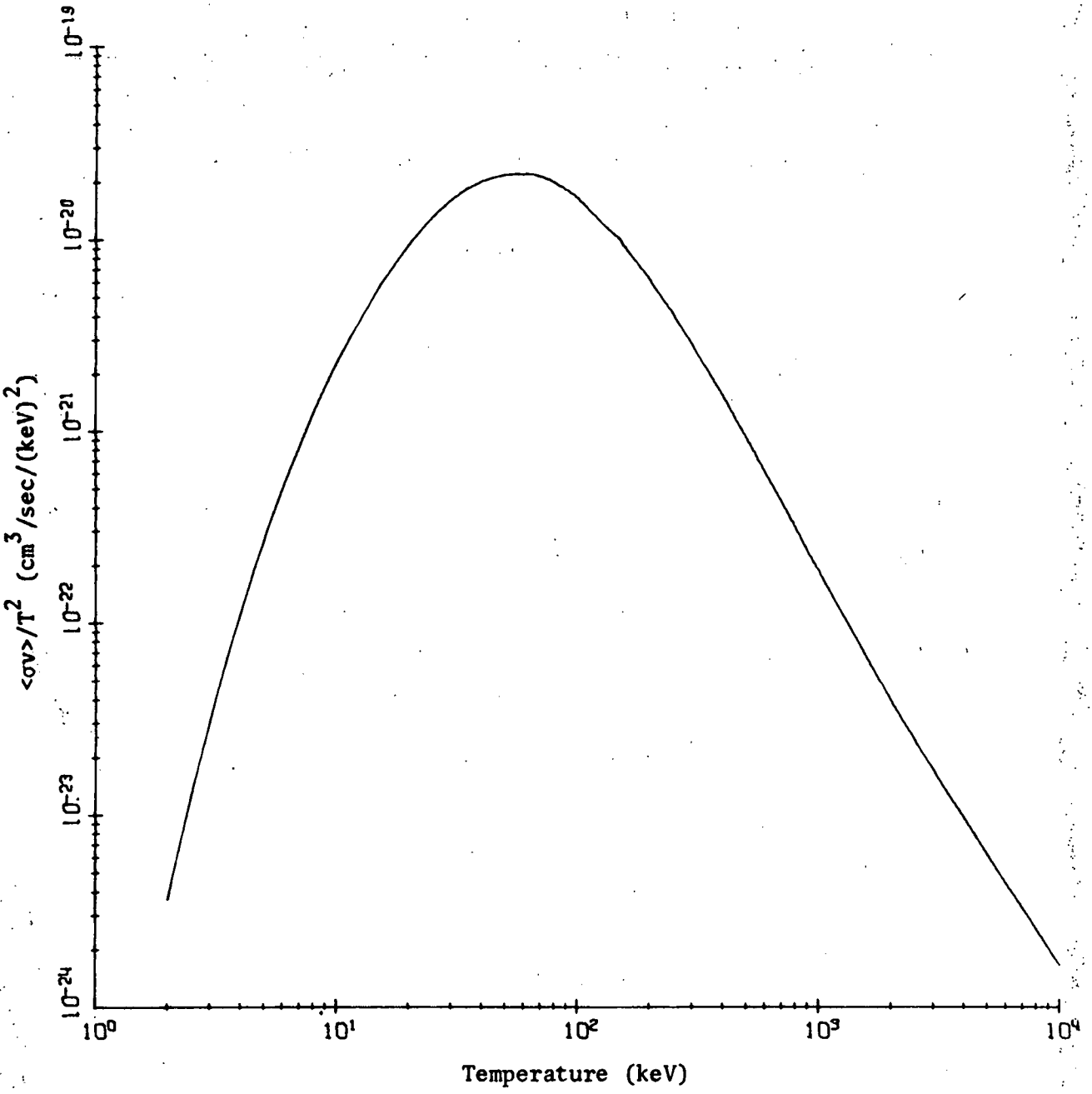
TEMP (keV)	<σv> (cm^3/sec)	TEMP (keV)	<σv> (cm^3/sec)
1.0000	0.30228D-25	1.5000	0.13227D-23
2.0000	0.14197D-22	2.5000	0.76413D-22
3.0000	0.27513D-21	3.5000	0.76414D-21
4.0000	0.17733D-20	4.5000	0.36106D-20
5.0000	0.66596D-20	5.5000	0.11373D-19
6.0000	0.18265D-19	6.5000	0.27901D-19
7.0000	0.40895D-19	7.5000	0.57892D-19
8.0000	0.79569D-19	8.5000	0.10663D-18
9.0000	0.13977D-18	9.5000	0.17974D-18
10.000	0.22725D-18	15.000	0.12743D-17
20.000	0.37913D-17	25.000	0.81774D-17
30.000	0.14520D-16	35.000	0.22655D-16
40.000	0.32262D-16	45.000	0.42970D-16
50.000	0.54408D-16	55.000	0.66248D-16
60.000	0.78216D-16	65.000	0.90094D-16
70.000	0.10172D-15	75.000	0.11296D-15
80.000	0.12374D-15	85.000	0.13400D-15
90.000	0.14371D-15	95.000	0.15285D-15
100.00	0.16143D-15	150.00	0.21961D-15
200.00	0.24373D-15	250.00	0.25088D-15
300.00	0.24997D-15	350.00	0.24536D-15
400.00	0.23916D-15	450.00	0.23247D-15
500.00	0.22580D-15	550.00	0.21943D-15
600.00	0.21346D-15	650.00	0.20795D-15
700.00	0.20289D-15	750.00	0.19825D-15
800.00	0.19403D-15	850.00	0.19017D-15
900.00	0.18666D-15	950.00	0.18345D-15
1000.0	0.18053D-15	1500.0	0.16196D-15
2000.0	0.15392D-15	2500.0	0.15040D-15
3000.0	0.14906D-15	3500.0	0.14885D-15
4000.0	0.14925D-15	4500.0	0.15000D-15
5000.0	0.15093D-15	5500.0	0.15197D-15
6000.0	0.15304D-15	6500.0	0.15414D-15
7000.0	0.15522D-15	7500.0	0.15629D-15
8000.0	0.15733D-15	8500.0	0.15834D-15
9000.0	0.15932D-15	9500.0	0.16027D-15
10000.	0.16118D-15	15000.	0.16869D-15
20000.	0.17407D-15	25000.	0.17813D-15
30000.	0.18132D-15	35000.	0.18392D-15
40000.	0.18610D-15	45000.	0.18794D-15
50000.	0.18954D-15	55000.	0.19093D-15
60000.	0.19217D-15	65000.	0.19328D-15
70000.	0.19427D-15	75000.	0.19518D-15
80000.	0.19601D-15	85000.	0.19677D-15
90000.	0.19748D-15	95000.	0.19812D-15



Values of <σv> assuming Maxwellian distributions for D-^{3}He fusion reactions

$\langle\sigma v\rangle/T^2$ For $^3He(d,p)^4He$ assuming Maxwellian distributions

TEMP (keV)	$\langle\sigma v\rangle/T^2$ ($cm^3/sec/(keV)^2$)	TEMP (keV)	$\langle\sigma v\rangle/T^2$ ($cm^3/sec/(keV)^2$)
1.0000	0.30228D-25	1.5000	0.58787D-24
2.0000	0.35492D-23	2.5000	0.12226D-22
3.0000	0.30570D-22	3.5000	0.62379D-22
4.0000	0.11083D-21	4.5000	0.17830D-21
5.0000	0.26638D-21	5.5000	0.37596D-21
6.0000	0.50735D-21	6.5000	0.66039D-21
7.0000	0.83458D-21	7.5000	0.10292D-20
8.0000	0.12433D-20	8.5000	0.14758D-20
9.0000	0.17256D-20	9.5000	0.19916D-20
10.000	0.22725D-20	15.000	0.56634D-20
20.000	0.94783D-20	25.000	0.13084D-19
30.000	0.16134D-19	35.000	0.18493D-19
40.000	0.20164D-19	45.000	0.21220D-19
50.000	0.21763D-19	55.000	0.21900D-19
60.000	0.21727D-19	65.000	0.21324D-19
70.000	0.20758D-19	75.000	0.20082D-19
80.000	0.19334D-19	85.000	0.18547D-19
90.000	0.17742D-19	95.000	0.16937D-19
100.00	0.16143D-19	150.00	0.97604D-20
200.00	0.60932D-20	250.00	0.40141D-20
300.00	0.27775D-20	350.00	0.20029D-20
400.00	0.14948D-20	450.00	0.11480D-20
500.00	0.90321D-21	550.00	0.72539D-21
600.00	0.59296D-21	650.00	0.49219D-21
700.00	0.41405D-21	750.00	0.35245D-21
800.00	0.30317D-21	850.00	0.26322D-21
900.00	0.23044D-21	950.00	0.20327D-21
1000.0	0.18053D-21	1500.0	0.71982D-22
2000.0	0.38480D-22	2500.0	0.24064D-22
3000.0	0.16562D-22	3500.0	0.12151D-22
4000.0	0.93283D-23	4500.0	0.74073D-23
5000.0	0.60373D-23	5500.0	0.50236D-23
6000.0	0.42512D-23	6500.0	0.36482D-23
7000.0	0.31678D-23	7500.0	0.27785D-23
8000.0	0.24583D-23	8500.0	0.21916D-23
9000.0	0.19669D-23	9500.0	0.17758D-23
10000.	0.16118D-23	15000.	0.74974D-24
20000.	0.43518D-24	25000.	0.28500D-24
30000.	0.20147D-24	35000.	0.15014D-24
40000.	0.11631D-24	45000.	0.92811D-25
50000.	0.75814D-25	55000.	0.63118D-25
60000.	0.53380D-25	65000.	0.45746D-25
70000.	0.39648D-25	75000.	0.34699D-25
80000.	0.30627D-25	85000.	0.27235D-25
90000.	0.24380D-25	95000.	0.21953D-25



Values of $<\sigma v>/T^2$ assuming Maxwellian distributions for D-^{3}He reactions

$\langle\sigma v\rangle_b$ For $^3He(d,p)^4He$ assuming beam - Maxwellian distributions

Helium-3 Temperature = 0

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.57437D-25	15.000	0.84890D-23
20.000	0.16424D-21	25.000	0.12310D-20
30.000	0.54238D-20	35.000	0.17138D-19
40.000	0.43283D-19	45.000	0.93206D-19
50.000	0.17836D-18	55.000	0.31183D-18
60.000	0.50790D-18	65.000	0.78156D-18
70.000	0.11482D-17	75.000	0.16233D-17
80.000	0.22221D-17	85.000	0.29599D-17
90.000	0.38511D-17	95.000	0.49101D-17
100.00	0.61505D-17	110.00	0.92275D-17
120.00	0.13180D-16	130.00	0.18098D-16
140.00	0.24061D-16	150.00	0.31138D-16
160.00	0.39390D-16	170.00	0.48863D-16
180.00	0.59594D-16	190.00	0.71601D-16
200.00	0.84887D-16	250.00	0.16913D-15
300.00	0.27273D-15	350.00	0.37158D-15
400.00	0.44138D-15	450.00	0.47276D-15
500.00	0.47218D-15	550.00	0.45203D-15
600.00	0.42286D-15	650.00	0.39129D-15
700.00	0.36077D-15	750.00	0.33281D-15
800.00	0.30787D-15	850.00	0.28592D-15
900.00	0.26672D-15	950.00	0.24997D-15
1000.0	0.23534D-15	1100.0	0.21132D-15
1200.0	0.19277D-15	1300.0	0.17828D-15
1400.0	0.16684D-15	1500.0	0.15771D-15
1600.0	0.15038D-15	1700.0	0.14445D-15
1800.0	0.13962D-15	1900.0	0.13568D-15
2000.0	0.13246D-15		

$\langle\sigma v\rangle_b$ For $^3He(d,p)^4He$ assuming beam - Maxwellian distributions

Helium-3 Temperature - 10 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.37255D-19	15.000	0.84823D-19
20.000	0.16427D-18	25.000	0.28600D-18
30.000	0.46135D-18	35.000	0.70231D-18
40.000	0.10214D-17	45.000	0.14313D-17
50.000	0.19452D-17	55.000	0.25759D-17
60.000	0.33365D-17	65.000	0.42396D-17
70.000	0.52977D-17	75.000	0.65229D-17
80.000	0.79268D-17	85.000	0.95206D-17
90.000	0.11315D-16	95.000	0.13320D-16
100.00	0.15545D-16	110.00	0.20690D-16
120.00	0.26811D-16	130.00	0.33957D-16
140.00	0.42163D-16	150.00	0.51449D-16
160.00	0.61818D-16	170.00	0.73258D-16
180.00	0.85739D-16	190.00	0.99212D-16
200.00	0.11361D-15	250.00	0.19617D-15
300.00	0.28452D-15	350.00	0.36165D-15
400.00	0.41553D-15	450.00	0.44268D-15
500.00	0.44661D-15	550.00	0.43415D-15
600.00	0.41213D-15	650.00	0.38587D-15
700.00	0.35883D-15	750.00	0.33295D-15
800.00	0.30917D-15	850.00	0.28781D-15
900.00	0.26886D-15	950.00	0.25216D-15
1000.0	0.23747D-15	1100.0	0.21323D-15
1200.0	0.19441D-15	1300.0	0.17967D-15
1400.0	0.16802D-15	1500.0	0.15872D-15
1600.0	0.15125D-15	1700.0	0.14520D-15
1800.0	0.14028D-15	1900.0	0.13626D-15
2000.0	0.13297D-15		

$\langle\sigma v\rangle_b$ For $^3He(d,p)^4He$ assuming beam - Maxwellian distributions

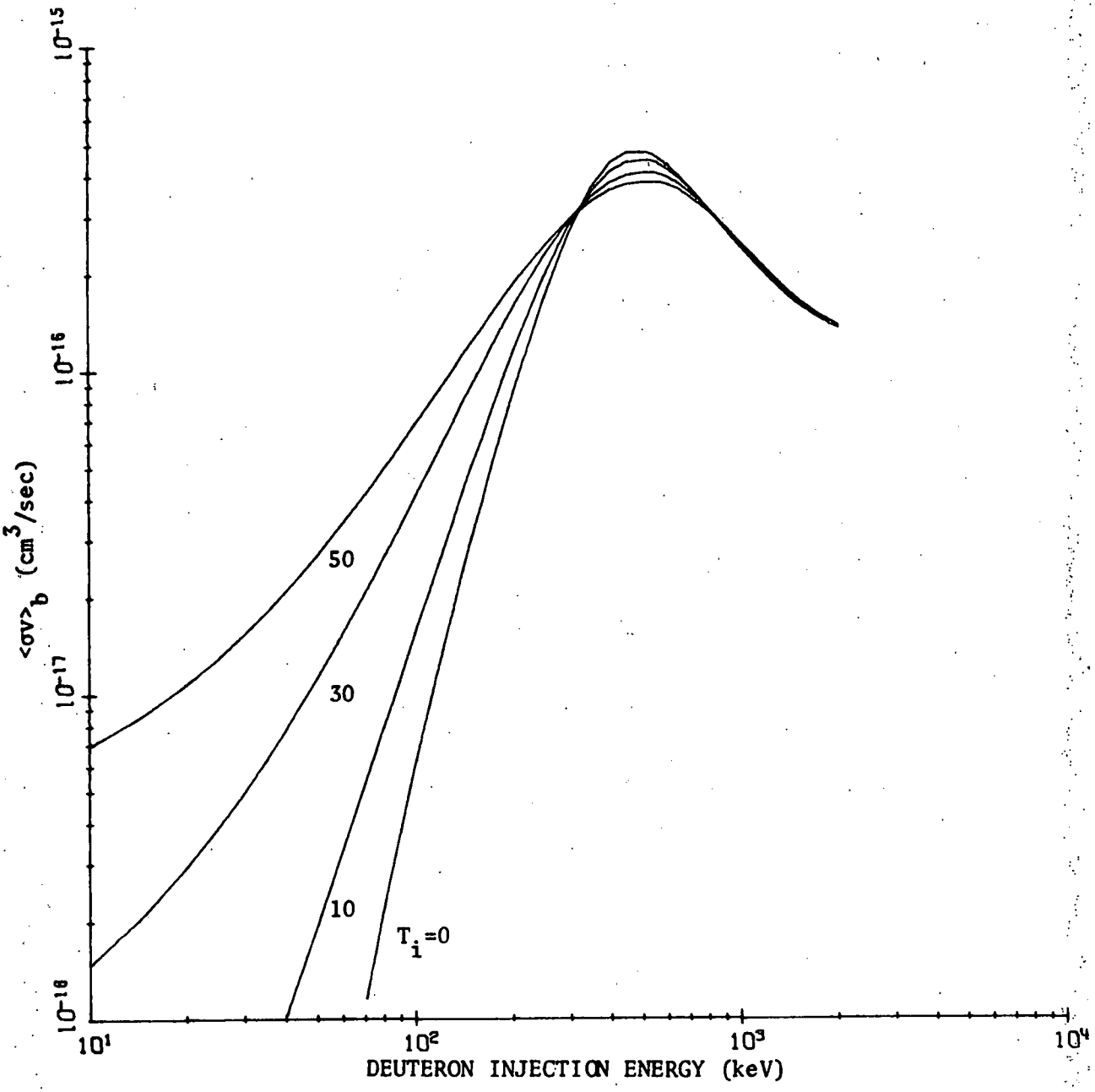
Helium - 3 Temperature = 30 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.14637D-17	15.000	0.21287D-17
20.000	0.29328D-17	25.000	0.38859D-17
30.000	0.49973D-17	35.000	0.62756D-17
40.000	0.77287D-17	45.000	0.93641D-17
50.000	0.11188D-16	55.000	0.13207D-16
60.000	0.15427D-16	65.000	0.17850D-16
70.000	0.20482D-16	75.000	0.23324D-16
80.000	0.26380D-16	85.000	0.29649D-16
90.000	0.33134D-16	95.000	0.36833D-16
100.00	0.40745D-16	110.00	0.49201D-16
120.00	0.58478D-16	130.00	0.68541D-16
140.00	0.79344D-16	150.00	0.90832D-16
160.00	0.10294D-15	170.00	0.11560D-15
180.00	0.12873D-15	190.00	0.14226D-15
200.00	0.15609D-15	250.00	0.22683D-15
300.00	0.29282D-15	350.00	0.34632D-15
400.00	0.38335D-15	450.00	0.40356D-15
500.00	0.40904D-15	550.00	0.40313D-15
600.00	0.38940D-15	650.00	0.37096D-15
700.00	0.35027D-15	750.00	0.32908D-15
800.00	0.30849D-15	850.00	0.28916D-15
900.00	0.27142D-15	950.00	0.25536D-15
1000.0	0.24096D-15	1100.0	0.21669D-15
1200.0	0.19752D-15	1300.0	0.18237D-15
1400.0	0.17034D-15	1500.0	0.16071D-15
1600.0	0.15296D-15	1700.0	0.14668D-15
1800.0	0.14157D-15	1900.0	0.13739D-15
2000.0	0.13397D-15		

$\langle\sigma v\rangle_b$ For $^3He(d,p)^4He$ assuming beam - Maxwellian distributions

Helium-3 Temperature = 50 keV

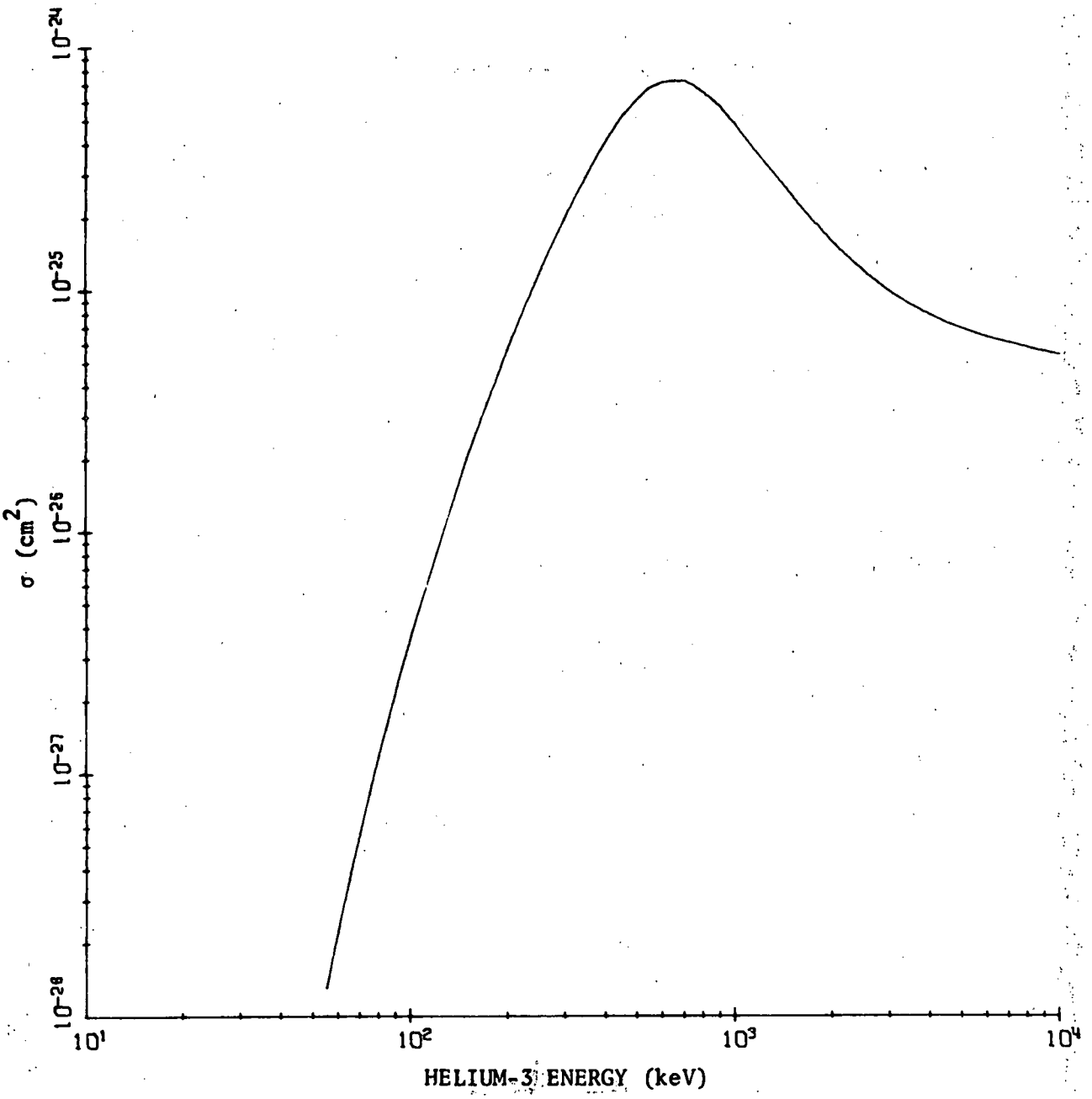
ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.69085D-17	15.000	0.87408D-17
20.000	0.10763D-16	25.000	0.12978D-16
30.000	0.15385D-16	35.000	0.17985D-16
40.000	0.20777D-16	45.000	0.23759D-16
50.000	0.26931D-16	55.000	0.30290D-16
60.000	0.33832D-16	65.000	0.37555D-16
70.000	0.41453D-16	75.000	0.45524D-16
80.000	0.49762D-16	85.000	0.54161D-16
90.000	0.58716D-16	95.000	0.63421D-16
100.00	0.68269D-16	110.00	0.78369D-16
120.00	0.88958D-16	130.00	0.99978D-16
140.00	0.11137D-15	150.00	0.12306D-15
160.00	0.13499D-15	170.00	0.14709D-15
180.00	0.15931D-15	190.00	0.17157D-15
200.00	0.18383D-15	250.00	0.24297D-15
300.00	0.29451D-15	350.00	0.33478D-15
400.00	0.36243D-15	450.00	0.37792D-15
500.00	0.38284D-15	550.00	0.37934D-15
600.00	0.36966D-15	650.00	0.35584D-15
700.00	0.33959D-15	750.00	0.32225D-15
800.00	0.30476D-15	850.00	0.28778D-15
900.00	0.27172D-15	950.00	0.25681D-15
1000.0	0.24313D-15	1100.0	0.21949D-15
1200.0	0.20035D-15	1300.0	0.18498D-15
1400.0	0.17265D-15	1500.0	0.16273D-15
1600.0	0.15471D-15	1700.0	0.14821D-15
1800.0	0.14290D-15	1900.0	0.13856D-15
2000.0	0.13500D-15		



Values of $\langle\sigma v\rangle_b$ for injection of deuterium into a helium-3 background at various temperatures (keV).

Cross Section For $D(^3He,p)^4He$

ENERGY (keV)	σ (cm^2)	ENERGY (keV)	σ (cm^2)
1.0000	0.55765D-67	1.5000	0.18913D-58
2.0000	0.21985D-53	2.5000	0.61293D-50
3.0000	0.21043D-47	3.5000	0.19434D-45
4.0000	0.73953D-44	4.5000	0.14962D-42
5.0000	0.18943D-41	5.5000	0.16748D-40
6.0000	0.11167D-39	6.5000	0.59368D-39
7.0000	0.26230D-38	7.5000	0.99402D-38
8.0000	0.33113D-37	8.5000	0.98857D-37
9.0000	0.26865D-36	9.5000	0.67302D-36
10.000	0.15705D-35	15.000	0.60017D-33
20.000	0.19943D-31	25.000	0.21289D-30
30.000	0.12051D-29	35.000	0.45916D-29
40.000	0.13405D-28	45.000	0.32395D-28
50.000	0.68083D-28	55.000	0.12861D-27
60.000	0.22349D-27	65.000	0.36324D-27
70.000	0.55911D-27	75.000	0.82272D-27
80.000	0.11658D-26	85.000	0.16001D-26
90.000	0.21368D-26	95.000	0.27871D-26
100.00	0.35613D-26	150.00	0.20005D-25
200.00	0.56194D-25	250.00	0.11465D-24
300.00	0.19488D-24	350.00	0.29325D-24
400.00	0.40222D-24	450.00	0.51039D-24
500.00	0.60471D-24	550.00	0.67424D-24
600.00	0.71363D-24	650.00	0.72394D-24
700.00	0.71078D-24	750.00	0.68147D-24
800.00	0.64279D-24	850.00	0.59996D-24
900.00	0.55653D-24	950.00	0.51463D-24
1000.0	0.47542D-24	1500.0	0.23980D-24
2000.0	0.15376D-24	2500.0	0.11556D-24
3000.0	0.95555D-25	3500.0	0.83756D-25
4000.0	0.76155D-25	4500.0	0.70906D-25
5000.0	0.67073D-25	5500.0	0.64143D-25
6000.0	0.61815D-25	6500.0	0.59907D-25
7000.0	0.58301D-25	7500.0	0.56918D-25
8000.0	0.55706D-25	8500.0	0.54628D-25
9000.0	0.53655D-25	9500.0	0.52769D-25
10000.	0.51953D-25	15000.	0.46064D-25
20000.	0.42198D-25	25000.	0.39296D-25
30000.	0.36982D-25	35000.	0.35071D-25
40000.	0.33452D-25	45000.	0.32055D-25
50000.	0.30831D-25	55000.	0.29747D-25
60000.	0.28778D-25	65000.	0.27903D-25
70000.	0.27108D-25	75000.	0.26381D-25
80000.	0.25713D-25	85000.	0.25096D-25
90000.	0.24524D-25	95000.	0.23991D-25



Cross Section For $D(^3He,p)^4He$

$\langle\sigma v\rangle_b$ For $D(^3He,p)^4He$ assuming beam - Maxwellian distribution

Deuterium Temperature = 0

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.12559D-27	15.000	0.58783D-25
20.000	0.22554D-23	25.000	0.26919D-22
30.000	0.16693D-21	35.000	0.68695D-21
40.000	0.21440D-20	45.000	0.54957D-20
50.000	0.12175D-19	55.000	0.24121D-19
60.000	0.43778D-19	65.000	0.74060D-19
70.000	0.11830D-18	75.000	0.18018D-18
80.000	0.26370D-18	85.000	0.37306D-18
90.000	0.51265D-18	95.000	0.68698D-18
100.00	0.90061D-18	110.00	0.14643D-17
120.00	0.22403D-17	130.00	0.32647D-17
140.00	0.45722D-17	150.00	0.61960D-17
160.00	0.81676D-17	170.00	0.10517D-16
180.00	0.13271D-16	190.00	0.16456D-16
200.00	0.20097D-16	250.00	0.45842D-16
300.00	0.85361D-16	350.00	0.13874D-15
400.00	0.20343D-15	450.00	0.27380D-15
500.00	0.34195D-15	550.00	0.39988D-15
600.00	0.44206D-15	650.00	0.46676D-15
700.00	0.47557D-15	750.00	0.47196D-15
800.00	0.45977D-15	850.00	0.44235D-15
900.00	0.42222D-15	950.00	0.40113D-15
1000.0	0.38020D-15	1100.0	0.34112D-15
1200.0	0.30723D-15	1300.0	0.27865D-15
1400.0	0.25478D-15	1500.0	0.23487D-15
1600.0	0.21822D-15	1700.0	0.20424D-15
1800.0	0.19244D-15	1900.0	0.18243D-15
2000.0	0.17390D-15		

$\langle\sigma v\rangle_b$ For $D(^3He,p)^4He$ assuming beam - Maxwellian distributions

Deuterium Temperature = 10 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.89066D-19	15.000	0.14969D-18
20.000	0.23146D-18	25.000	0.33776D-18
30.000	0.47212D-18	35.000	0.63810D-18
40.000	0.83935D-18	45.000	0.10795D-17
50.000	0.13623D-17	55.000	0.16915D-17
60.000	0.20707D-17	65.000	0.25035D-17
70.000	0.29937D-17	75.000	0.35447D-17
80.000	0.41602D-17	85.000	0.48436D-17
90.000	0.55982D-17	95.000	0.64274D-17
100.00	0.73343D-17	110.00	0.93938D-17
120.00	0.11800D-16	130.00	0.14575D-16
140.00	0.17737D-16	150.00	0.21304D-16
160.00	0.25291D-16	170.00	0.29709D-16
180.00	0.34567D-16	190.00	0.39872D-16
200.00	0.45627D-16	250.00	0.81059D-16
300.00	0.12648D-15	350.00	0.17901D-15
400.00	0.23454D-15	450.00	0.28855D-15
500.00	0.33695D-15	550.00	0.37674D-15
600.00	0.40632D-15	650.00	0.42540D-15
700.00	0.43472D-15	750.00	0.43572D-15
800.00	0.43011D-15	850.00	0.41965D-15
900.00	0.40590D-15	950.00	0.39016D-15
1000.0	0.37346D-15	1100.0	0.33991D-15
1200.0	0.30878D-15	1300.0	0.28139D-15
1400.0	0.25790D-15	1500.0	0.23798D-15
1600.0	0.22114D-15	1700.0	0.20691D-15
1800.0	0.19485D-15	1900.0	0.18460D-15
2000.0	0.17585D-15		

$\langle\sigma v\rangle_b$ For $D(^3He,p)^4He$ assuming beam - Maxwellian distributions

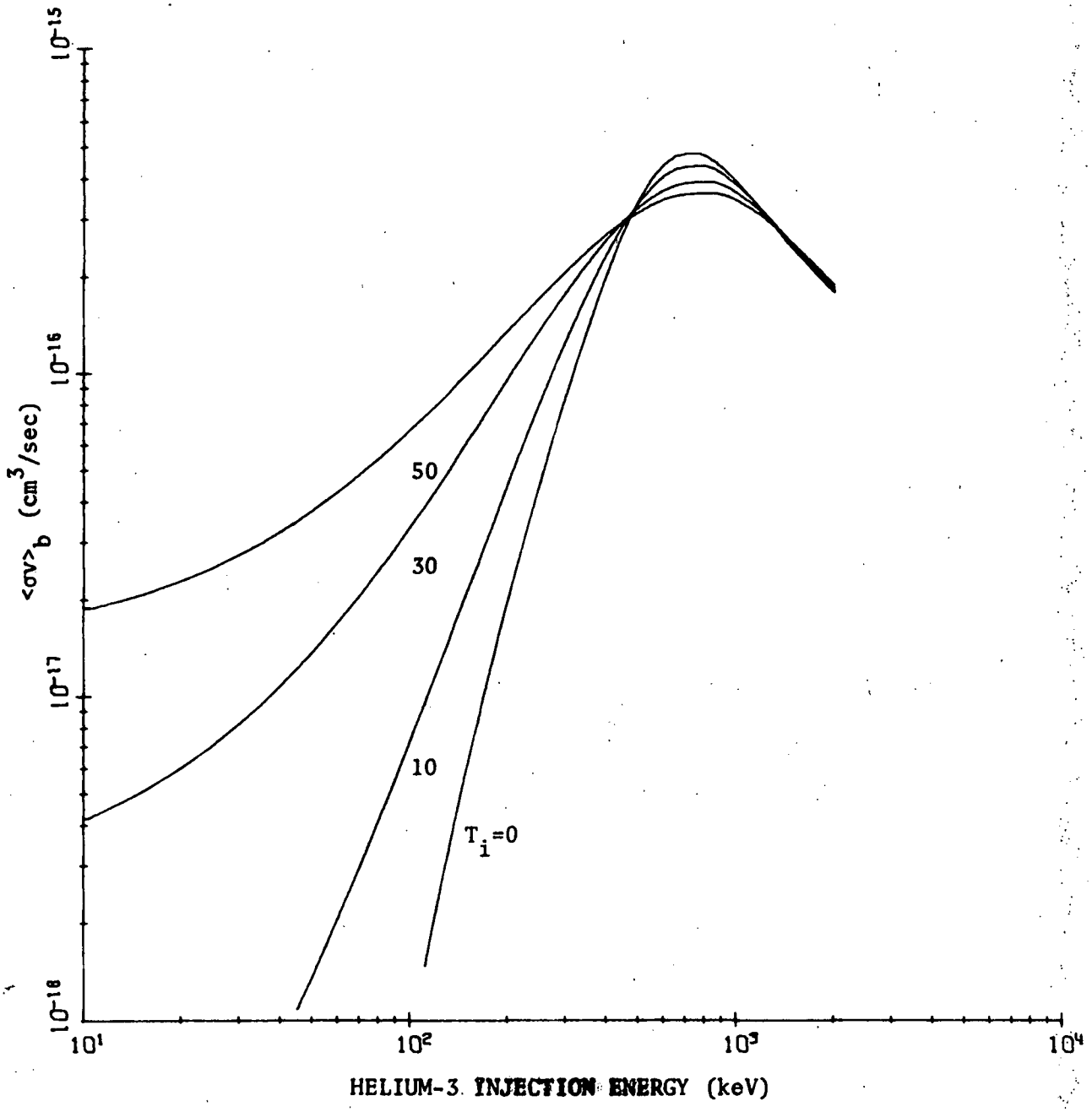
Deuterium Temperature = 30 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.41499D-17	15.000	0.50580D-17
20.000	0.60467D-17	25.000	0.71174D-17
30.000	0.82713D-17	35.000	0.95093D-17
40.000	0.10832D-16	45.000	0.12241D-16
50.000	0.13736D-16	55.000	0.15319D-16
60.000	0.16988D-16	65.000	0.18745D-16
70.000	0.20589D-16	75.000	0.22520D-16
80.000	0.24538D-16	85.000	0.26643D-16
90.000	0.28835D-16	95.000	0.31111D-16
100.00	0.33473D-16	110.00	0.38448D-16
120.00	0.43750D-16	130.00	0.49370D-16
140.00	0.55297D-16	150.00	0.61517D-16
160.00	0.68017D-16	170.00	0.74780D-16
180.00	0.81789D-16	190.00	0.89029D-16
200.00	0.96479D-16	250.00	0.13621D-15
300.00	0.17823D-15	350.00	0.22006D-15
400.00	0.25951D-15	450.00	0.29489D-15
500.00	0.32501D-15	550.00	0.34924D-15
600.00	0.36740D-15	650.00	0.37969D-15
700.00	0.38655D-15	750.00	0.38874D-15
800.00	0.38687D-15	850.00	0.38174D-15
900.00	0.37407D-15	950.00	0.36450D-15
1000.0	0.35362D-15	1100.0	0.32978D-15
1200.0	0.30541D-15	1300.0	0.28221D-15
1400.0	0.26106D-15	1500.0	0.24226D-15
1600.0	0.22582D-15	1700.0	0.21160D-15
1800.0	0.19932D-15	1900.0	0.18875D-15
2000.0	0.17965D-15		

$\langle\sigma v\rangle_b$ For $D(^3He,p)^4He$ assuming beam - Maxwellian distributions

Deuterium Temperature = 50 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.18531D-16	15.000	0.20662D-16
20.000	0.22866D-16	25.000	0.25141D-16
30.000	0.27486D-16	35.000	0.29900D-16
40.000	0.32380D-16	45.000	0.34925D-16
50.000	0.37533D-16	55.000	0.40202D-16
60.000	0.42931D-16	65.000	0.45718D-16
70.000	0.48561D-16	75.000	0.51458D-16
80.000	0.54407D-16	85.000	0.57406D-16
90.000	0.60453D-16	95.000	0.63547D-16
100.00	0.66685D-16	110.00	0.73086D-16
120.00	0.79640D-16	130.00	0.86333D-16
140.00	0.93147D-16	150.00	0.10007D-15
160.00	0.10708D-15	170.00	0.11417D-15
180.00	0.12131D-15	190.00	0.12851D-15
200.00	0.13573D-15	250.00	0.17184D-15
300.00	0.20682D-15	350.00	0.23939D-15
400.00	0.26862D-15	450.00	0.29390D-15
500.00	0.31492D-15	550.00	0.33160D-15
600.00	0.34405D-15	650.00	0.35254D-15
700.00	0.35742D-15	750.00	0.35912D-15
800.00	0.35807D-15	850.00	0.35471D-15
900.00	0.34948D-15	950.00	0.34276D-15
1000.0	0.33491D-15	1100.0	0.31702D-15
1200.0	0.29782D-15	1300.0	0.27868D-15
1400.0	0.26044D-15	1500.0	0.24361D-15
1600.0	0.22838D-15	1700.0	0.21481D-15
1800.0	0.20283D-15	1900.0	0.19231D-15
2000.0	0.18312D-15		



Values of $\langle\sigma v\rangle_b$ for injection of helium-3 into a deuterium background at various temperatures (keV)

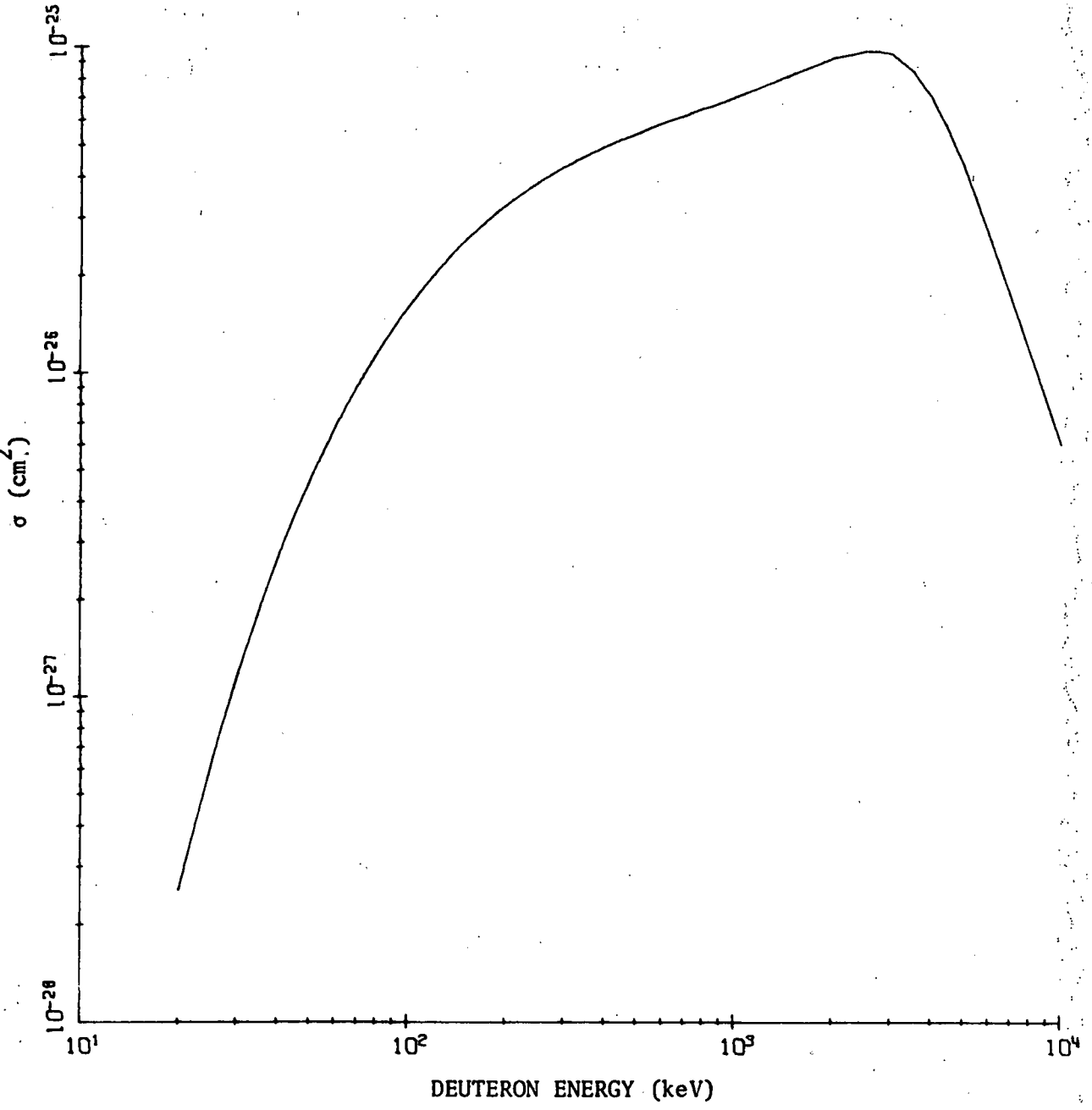
Section 3

Deuterium-Deuterium Reactions

(Proton Branch)

Cross Section For D(d,p)T

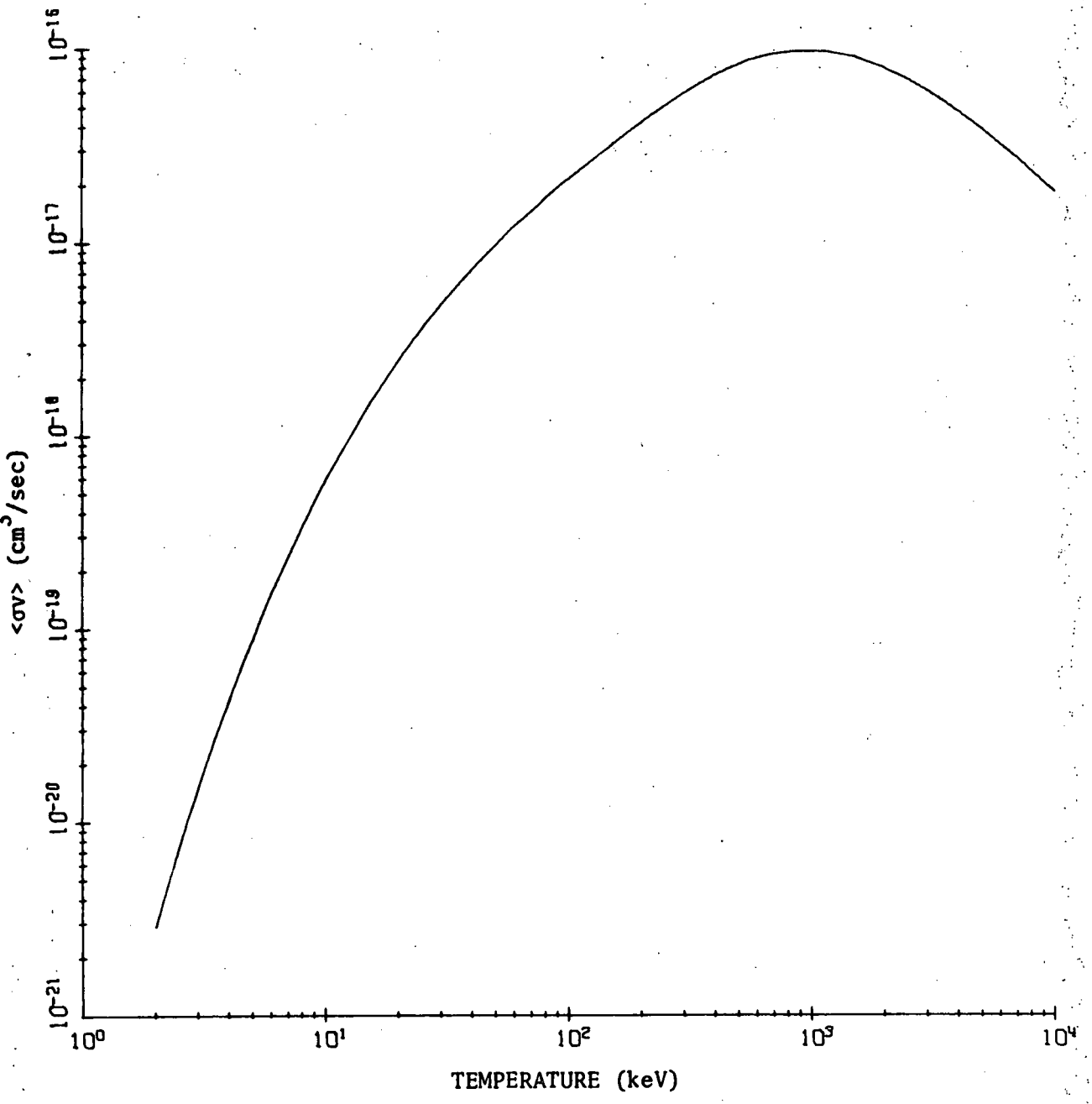
ENERGY (keV)	$\sigma(cm^2)$	ENERGY (keV)	$\sigma\ (cm^2)$
1.0000	0.14300D-41	1.5000	0.44976D-38
2.0000	0.52247D-36	2.5000	0.13053D-34
3.0000	0.13798D-33	3.5000	0.85183D-33
4.0000	0.36608D-32	4.5000	0.12161D-31
5.0000	0.33389D-31	5.5000	0.79242D-31
6.0000	0.16775D-30	6.5000	0.32407D-30
7.0000	0.58100D-30	7.5000	0.97922D-30
8.0000	0.15670D-29	8.5000	0.23997D-29
9.0000	0.35391D-29	9.5000	0.50523D-29
10.000	0.70108D-29	15.000	0.67970D-28
20.000	0.25167D-27	25.000	0.59907D-27
30.000	0.11172D-26	35.000	0.17920D-26
40.000	0.25998D-26	45.000	0.35148D-26
50.000	0.45125D-26	55.000	0.55710D-26
60.000	0.66721D-26	65.000	0.78006D-26
70.000	0.89440D-26	75.000	0.10092D-25
80.000	0.11238D-25	85.000	0.12375D-25
90.000	0.13499D-25	95.000	0.14605D-25
100.00	0.15691D-25	150.00	0.25242D-25
200.00	0.32537D-25	250.00	0.38151D-25
300.00	0.42592D-25	350.00	0.46210D-25
400.00	0.49242D-25	450.00	0.51847D-25
500.00	0.54137D-25	550.00	0.56190D-25
600.00	0.58062D-25	650.00	0.59795D-25
700.00	0.61421D-25	750.00	0.62961D-25
800.00	0.64436D-25	850.00	0.65857D-25
900.00	0.67236D-25	950.00	0.68581D-25
1000.0	0.69898D-25	1500.0	0.82101D-25
2000.0	0.92009D-25	2500.0	0.96640D-25
3000.0	0.93212D-25	3500.0	0.82384D-25
4000.0	0.68021D-25	4500.0	0.53957D-25
5000.0	0.42122D-25	5500.0	0.32868D-25
6000.0	0.25855D-25	6500.0	0.20581D-25
7000.0	0.16600D-25	7500.0	0.13565D-25
8000.0	0.11225D-25	8500.0	0.93960D-26
9000.0	0.79486D-26	9500.0	0.67891D-26
10000.	0.58496D-26	15000.	0.18520D-26
20000.	0.84311D-27	25000.	0.46419D-27
30000.	0.28708D-27	35000.	0.19200D-27
40000.	0.13586D-27	45000.	0.10030D-27
50000.	0.76549D-28	55000.	0.59997D-28
60000.	0.48062D-28	65000.	0.39210D-28
70000.	0.32486D-28	75000.	0.27276D-28
80000.	0.23166D-28	85000.	0.19875D-28
90000.	0.17204D-28	95000.	0.15011D-28



Cross section for D(d,p)T

<σv> For D(d,p)T assuming Maxwellian distributions

Temp (keV)	<σv> (cm^3/sec)	Temp (keV)	<σv> (cm^3/sec)
1.0000	0.82999D-22	1.5000	0.72888D-21
2.0000	0.28200D-20	2.5000	0.73082D-20
3.0000	0.15012D-19	3.5000	0.26553D-19
4.0000	0.42363D-19	4.5000	0.62712D-19
5.0000	0.87742D-19	5.5000	0.11750D-18
6.0000	0.15195D-18	6.5000	0.19102D-18
7.0000	0.23460D-18	7.5000	0.28252D-18
8.0000	0.33464D-18	8.5000	0.39078D-18
9.0000	0.45077D-18	9.5000	0.51443D-18
10.000	0.58158D-18	15.000	0.14098D-17
20.000	0.24335D-17	25.000	0.35661D-17
30.000	0.47570D-17	35.000	0.59764D-17
40.000	0.72066D-17	45.000	0.84367D-17
50.000	0.96604D-17	55.000	0.10874D-16
60.000	0.12075D-16	65.000	0.13262D-16
70.000	0.14435D-16	75.000	0.15595D-16
80.000	0.16741D-16	85.000	0.17873D-16
90.000	0.18993D-16	95.000	0.20102D-16
100.00	0.21198D-16	150.00	0.31653D-16
200.00	0.41362D-16	250.00	0.50347D-16
300.00	0.58500D-16	350.00	0.65728D-16
400.00	0.71998D-16	450.00	0.77328D-16
500.00	0.81777D-16	550.00	0.85422D-16
600.00	0.88350D-16	650.00	0.90647D-16
700.00	0.92397D-16	750.00	0.93675D-16
800.00	0.94549D-16	850.00	0.95077D-16
900.00	0.95313D-16	950.00	0.95301D-16
1000.0	0.95081D-16	1500.0	0.86872D-16
2000.0	0.75916D-16	2500.0	0.66029D-16
3000.0	0.57753D-16	3500.0	0.50931D-16
4000.0	0.45296D-16	4500.0	0.40605D-16
5000.0	0.36663D-16	5500.0	0.33318D-16
6000.0	0.30454D-16	6500.0	0.27981D-16
7000.0	0.25828D-16	7500.0	0.23940D-16
8000.0	0.22275D-16	8500.0	0.20797D-16
9000.0	0.19478D-16	9500.0	0.18294D-16
10000.	0.17228D-16	15000.	0.10524D-16
20000.	0.72978D-17	25000.	0.54522D-17
30000.	0.42786D-17	35000.	0.34767D-17
40000.	0.28997D-17	45000.	0.24677D-17
50000.	0.21342D-17	55000.	0.18703D-17
60000.	0.16571D-17	65000.	0.14819D-17
70000.	0.13358D-17	75000.	0.12124D-17
80000.	0.11070D-17	85000.	0.10162D-17
90000.	0.93728D-18	95000.	0.86814D-18

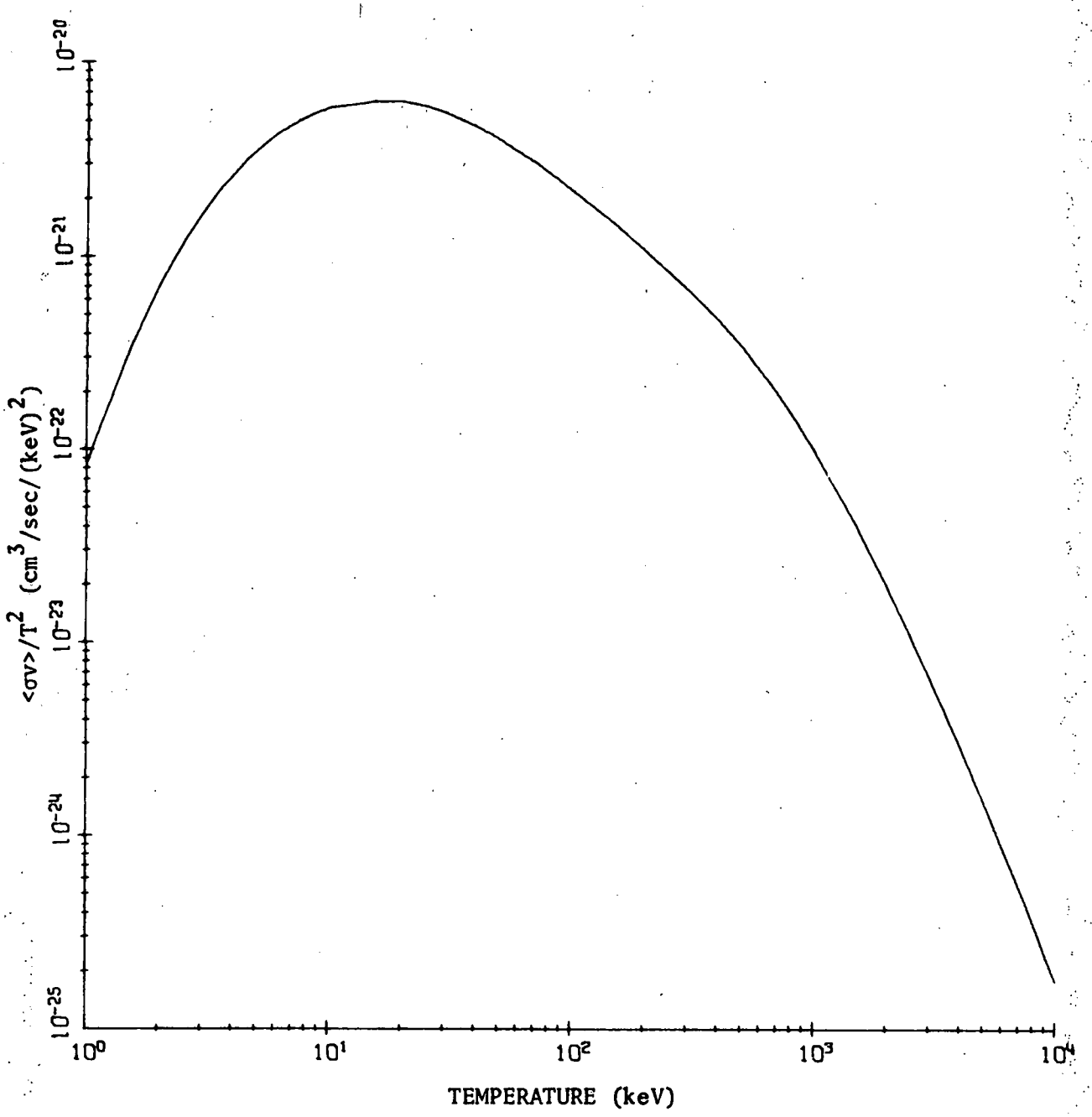


Values of <σv> assuming Maxwellian distributions for

D-D (proton branch) fusion reactions

$\langle\sigma v\rangle/T^2$ For D(d,p)T assuming Maxwellian distributions

TEMP (keV)	$^3\langle\sigma v\rangle/T^2$ ($cm^3/sec/(keV)^2$)	TEMP (keV)	$^3\langle\sigma v\rangle/T^2$ ($cm^3/sec/(keV)^2$)
1.0000	0.82999D-22	1.5000	0.32395D-21
2.0000	0.70499D-21	2.5000	0.11693D-20
3.0000	0.16680D-20	3.5000	0.21676D-20
4.0000	0.26477D-20	4.5000	0.30969D-20
5.0000	0.35097D-20	5.5000	0.38843D-20
6.0000	0.42209D-20	6.5000	0.45213D-20
7.0000	0.47877D-20	7.5000	0.50226D-20
8.0000	0.52287D-20	8.5000	0.54087D-20
9.0000	0.55651D-20	9.5000	0.57000D-20
10.000	0.58158D-20	15.000	0.62657D-20
20.000	0.60838D-20	25.000	0.57058D-20
30.000	0.52856D-20	35.000	0.48787D-20
40.000	0.45041D-20	45.000	0.41663D-20
50.000	0.38641D-20	55.000	0.35946D-20
60.000	0.33540D-20	65.000	0.31389D-20
70.000	0.29460D-20	75.000	0.27724D-20
80.000	0.26157D-20	85.000	0.24738D-20
90.000	0.23449D-20	95.000	0.22273D-20
100.00	0.21198D-20	150.00	0.14068D-20
200.00	0.10341D-20	250.00	0.80554D-21
300.00	0.65000D-21	350.00	0.53656D-21
400.00	0.44999D-21	450.00	0.38187D-21
500.00	0.32711D-21	550.00	0.28239D-21
600.00	0.24542D-21	650.00	0.21455D-21
700.00	0.18857D-21	750.00	0.16653D-21
800.00	0.14773D-21	850.00	0.13159D-21
900.00	0.11767D-21	950.00	0.10560D-21
1000.0	0.95081D-22	1500.0	0.38610D-22
2000.0	0.18979D-22	2500.0	0.10565D-22
3000.0	0.64170D-23	3500.0	0.41576D-23
4000.0	0.28310D-23	4500.0	0.20052D-23
5000.0	0.14665D-23	5500.0	0.11014D-23
6000.0	0.84595D-24	6500.0	0.66227D-24
7000.0	0.52710D-24	7500.0	0.42561D-24
8000.0	0.34805D-24	8500.0	0.28785D-24
9000.0	0.24047D-24	9500.0	0.20271D-24
10000.	0.17228D-24	15000.	0.46774D-25
20000.	0.18244D-25	25000.	0.87235D-26
30000.	0.47539D-26	35000.	0.28381D-26
40000.	0.18123D-26	45000.	0.12186D-26
50000.	0.85370D-27	55000.	0.61829D-27
60000.	0.46031D-27	65000.	0.35074D-27
70000.	0.27261D-27	75000.	0.21553D-27
80000.	0.17297D-27	85000.	0.14065D-27
90000.	0.11571D-27	95000.	0.96192D-28



Values of $<\sigma v>/T^2$ assuming Maxwellian distributions for D-D (proton branch) reactions

$\langle\sigma v\rangle_b$ For D(d,p)T assuming beam - Maxwellian distributions

Deuterium Temperature = 0

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.68609D-21	15.000	0.81465D-20
20.000	0.34831D-19	25.000	0.92696D-19
30.000	0.18937D-18	35.000	0.32808D-18
40.000	0.50884D-18	45.000	0.72966D-18
50.000	0.98744D-18	55.000	0.12786D-17
60.000	0.15994D-17	65.000	0.19462D-17
70.000	0.23157D-17	75.000	0.27048D-17
80.000	0.31107D-17	85.000	0.35308D-17
90.000	0.39629D-17	95.000	0.44052D-17
100.00	0.48558D-17	110.00	0.57762D-17
120.00	0.67143D-17	130.00	0.76624D-17
140.00	0.86148D-17	150.00	0.95672D-17
160.00	0.10516D-16	170.00	0.11460D-16
180.00	0.12395D-16	190.00	0.13322D-16
200.00	0.14240D-16	250.00	0.18668D-16
300.00	0.22829D-16	350.00	0.26753D-16
400.00	0.30477D-16	450.00	0.34036D-16
500.00	0.37462D-16	550.00	0.40780D-16
600.00	0.44013D-16	650.00	0.47177D-16
700.00	0.50289D-16	750.00	0.53360D-16
800.00	0.56400D-16	850.00	0.59419D-16
900.00	0.62422D-16	950.00	0.65415D-16
1000.0	0.68403D-16	1100.0	0.74378D-16
1200.0	0.80365D-16	1300.0	0.86369D-16
1400.0	0.92386D-16	1500.0	0.98402D-16
1600.0	0.10439D-15	1700.0	0.11033D-15
1800.0	0.11616D-15	1900.0	0.12185D-15
2000.0	0.12734D-15	3000.0	0.15799D-15
4000.0	0.13313D-15	5000.0	0.92172D-16
6000.0	0.61976D-16	7000.0	0.42979D-16
8000.0	0.31070D-16	9000.0	0.23336D-16
10000.	0.18102D-16		

$\langle\sigma v\rangle_b$ For D(d,p)T assuming beam - Maxwellian distributions

Deuterium Temperature = 10 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.33310D-18	15.000	0.50168D-18
20.000	0.69928D-18	25.000	0.92434D-18
30.000	0.11751D-17	35.000	0.14498D-17
40.000	0.17464D-17	45.000	0.20632D-17
50.000	0.23983D-17	55.000	0.27499D-17
60.000	0.31164D-17	65.000	0.34962D-17
70.000	0.38879D-17	75.000	0.42900D-17
80.000	0.47013D-17	85.000	0.51206D-17
90.000	0.55469D-17	95.000	0.59792D-17
100.00	0.64165D-17	110.00	0.73033D-17
120.00	0.82016D-17	130.00	0.91069D-17
140.00	0.10015D-16	150.00	0.10924D-16
160.00	0.11831D-16	170.00	0.12734D-16
180.00	0.13631D-16	190.00	0.14522D-16
200.00	0.15406D-16	250.00	0.19697D-16
300.00	0.23768D-16	350.00	0.27633D-16
400.00	0.31320D-16	450.00	0.34858D-16
500.00	0.38273D-16	550.00	0.41589D-16
600.00	0.44825D-16	650.00	0.47996D-16
700.00	0.51118D-16	750.00	0.54201D-16
800.00	0.57254D-16	850.00	0.60285D-16
900.00	0.63302D-16	950.00	0.66308D-16
1000.0	0.69308D-16	1100.0	0.75302D-16
1200.0	0.81297D-16	1300.0	0.87297D-16
1400.0	0.93293D-16	1500.0	0.99268D-16
1600.0	0.10520D-15	1700.0	0.11104D-15
1800.0	0.11675D-15	1900.0	0.12229D-15
2000.0	0.12760D-15	3000.0	0.15614D-15
4000.0	0.13205D-15	5000.0	0.92266D-16
6000.0	0.62305D-16	7000.0	0.43252D-16
8000.0	0.31261D-16	9000.0	0.23467D-16
10000.	0.18194D-16		

$\langle\sigma v\rangle_b$ For D(d,p)T assuming beam - Maxwellian distributions

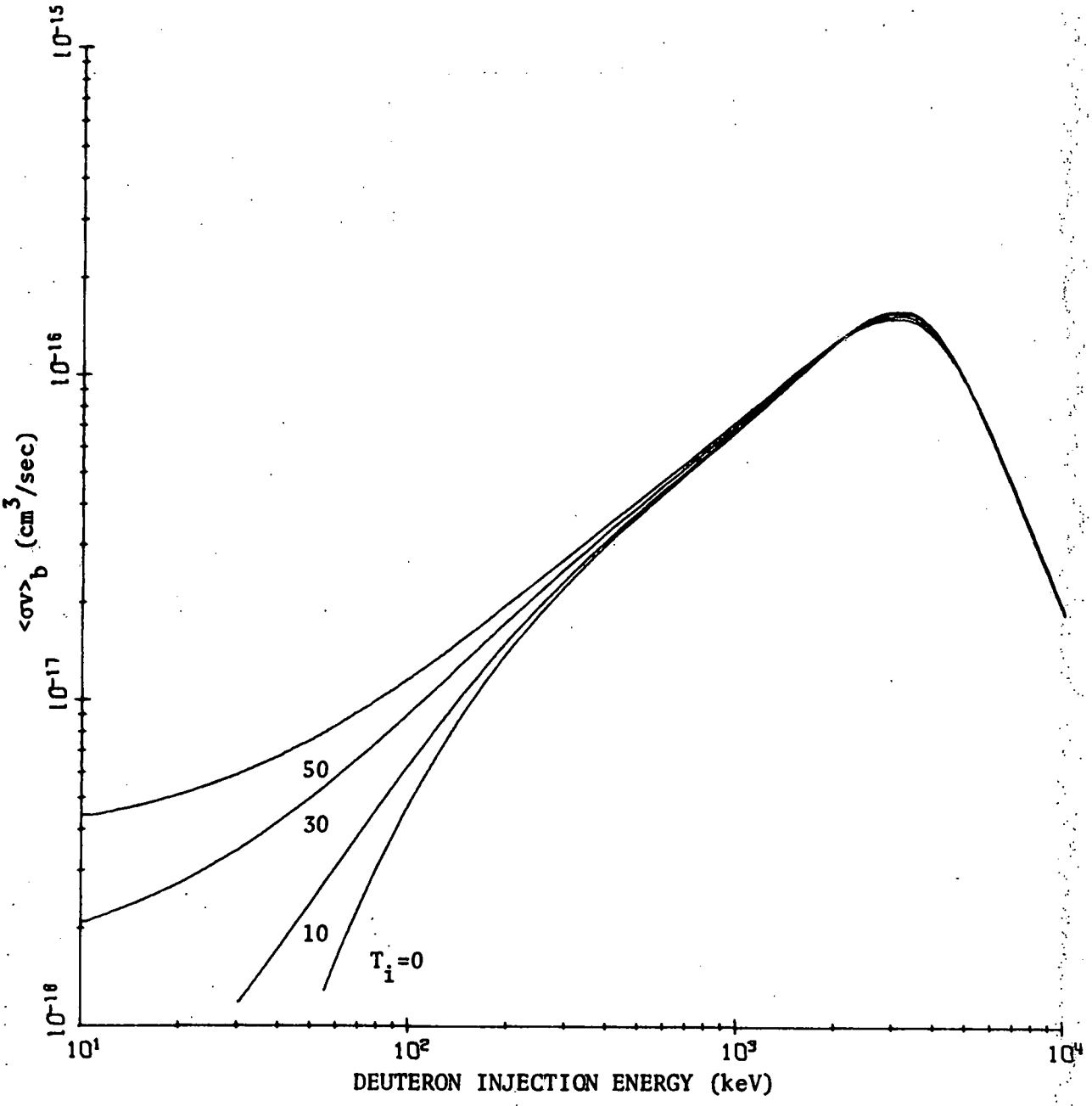
Deuterium Temperature = 30 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.20639D-17	15.000	0.24074D-17
20.000	0.27608D-17	25.000	0.31232D-17
30.000	0.34938D-17	35.000	0.38718D-17
40.000	0.42567D-17	45.000	0.46477D-17
50.000	0.50441D-17	55.000	0.54456D-17
60.000	0.58514D-17	65.000	0.62611D-17
70.000	0.66743D-17	75.000	0.70906D-17
80.000	0.75094D-17	85.000	0.79305D-17
90.000	0.83535D-17	95.000	0.87782D-17
100.00	0.92041D-17	110.00	0.10059D-16
120.00	0.10915D-16	130.00	0.11773D-16
140.00	0.12629D-16	150.00	0.13484D-16
160.00	0.14335D-16	170.00	0.15182D-16
180.00	0.16025D-16	190.00	0.16863D-16
200.00	0.17695D-16	250.00	0.21765D-16
300.00	0.25673D-16	350.00	0.29425D-16
400.00	0.33037D-16	450.00	0.36529D-16
500.00	0.39919D-16	550.00	0.43224D-16
600.00	0.46461D-16	650.00	0.49641D-16
700.00	0.52776D-16	750.00	0.55877D-16
800.00	0.58949D-16	850.00	0.62000D-16
900.00	0.65036D-16	950.00	0.68059D-16
1000.0	0.71074D-16	1100.0	0.77083D-16
1200.0	0.83072D-16	1300.0	0.89037D-16
1400.0	0.94961D-16	1500.0	0.10082D-15
1600.0	0.10659D-15	1700.0	0.11222D-15
1800.0	0.11768D-15	1900.0	0.12290D-15
2000.0	0.12786D-15	3000.0	0.15268D-15
4000.0	0.12989D-15	5000.0	0.92294D-16
6000.0	0.62891D-16	7000.0	0.43770D-16
8000.0	0.31632D-16	9000.0	0.23723D-16
10000.	0.18372D-16		

$\langle\sigma v\rangle_b$ For D(d,p)T assuming beam-Maxwellian distributions

Deuterium Temperature = 50 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.43528D-17	15.000	0.47506D-17
20.000	0.51512D-17	25.000	0.55543D-17
30.000	0.59596D-17	35.000	0.63670D-17
40.000	0.67760D-17	45.000	0.71866D-17
50.000	0.75986D-17	55.000	0.80116D-17
60.000	0.84255D-17	65.000	0.88402D-17
70.000	0.92554D-17	75.000	0.96711D-17
80.000	0.10087D-16	85.000	0.10503D-16
90.000	0.10919D-16	95.000	0.11335D-16
100.00	0.11751D-16	110.00	0.12582D-16
120.00	0.13411D-16	130.00	0.14237D-16
140.00	0.15060D-16	150.00	0.15879D-16
160.00	0.16695D-16	170.00	0.17506D-16
180.00	0.18313D-16	190.00	0.19115D-16
200.00	0.19912D-16	250.00	0.23821D-16
300.00	0.27601D-16	350.00	0.31257D-16
400.00	0.34801D-16	450.00	0.38248D-16
500.00	0.41610D-16	550.00	0.44902D-16
600.00	0.48134D-16	650.00	0.51317D-16
700.00	0.54466D-16	750.00	0.57570D-16
800.00	0.60654D-16	850.00	0.63716D-16
900.00	0.66761D-16	950.00	0.69791D-16
1000.0	0.72809D-16	1100.0	0.78809D-16
1200.0	0.84763D-16	1300.0	0.90659D-16
1400.0	0.96479D-16	1500.0	0.10219D-15
1600.0	0.10777D-15	1700.0	0.11317D-15
1800.0	0.11835D-15	1900.0	0.12326D-15
2000.0	0.12787D-15	3000.0	0.14956D-15
4000.0	0.12783D-15	5000.0	0.92189D-16
6000.0	0.63412D-16	7000.0	0.44275D-16
8000.0	0.32004D-16	9000.0	0.23982D-16
10000.	0.18553D-16		



Values of $\langle\sigma v\rangle_b$ (protron branch) for injection of Deuterium into a Deuterium background at various temperatures (keV).

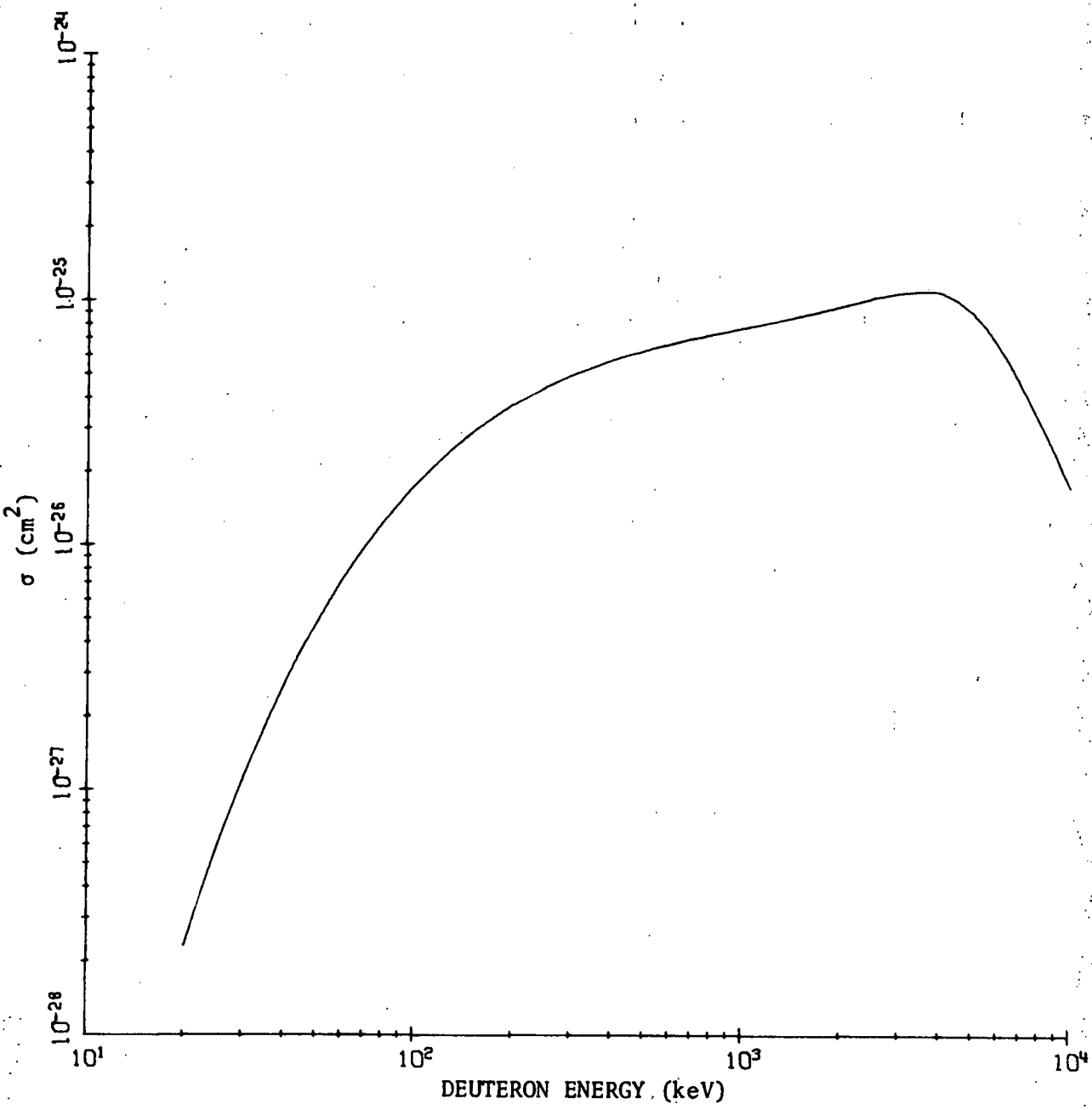
Section 4

Deuterium-Deuterium Reactions

(Neutron Branch)

Cross Section For $D(d,n)^3He$

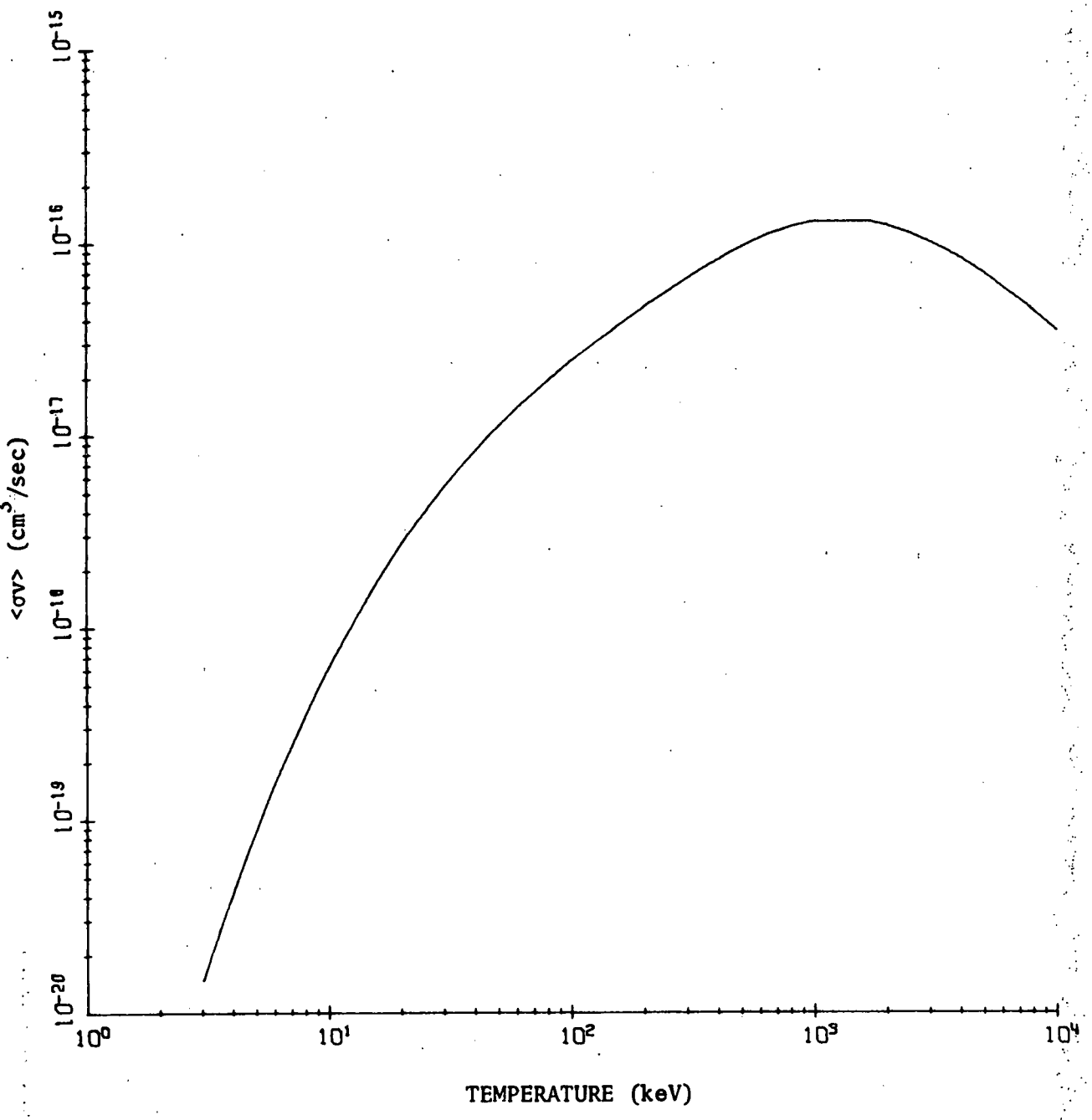
ENERGY (keV)	σ (cm^2)	ENERGY (keV)	σ (cm^2)
1.0000	0.32581D-42	1.5000	0.14206D-38
2.0000	0.20049D-36	2.5000	0.57207D-35
3.0000	0.66699D-34	3.5000	0.44437D-33
4.0000	0.20306D-32	4.5000	0.70978D-32
5.0000	0.20344D-31	5.5000	0.50100D-31
6.0000	0.10954D-30	6.5000	0.21772D-30
7.0000	0.40035D-30	7.5000	0.69027D-30
8.0000	0.11276D-29	8.5000	0.17594D-29
9.0000	0.26397D-29	9.5000	0.38282D-29
10.000	0.53901D-29	15.000	0.57909D-28
20.000	0.22790D-27	25.000	0.56540D-27
30.000	0.10869D-26	35.000	0.17848D-26
40.000	0.26384D-26	45.000	0.36223D-26
50.000	0.47109D-26	55.000	0.58804D-26
60.000	0.71098D-26	65.000	0.83813D-26
70.000	0.96801D-26	75.000	0.10994D-25
80.000	0.12313D-25	85.000	0.13629D-25
90.000	0.14936D-25	95.000	0.16228D-25
100.00	0.17502D-25	150.00	0.28864D-25
200.00	0.37642D-25	250.00	0.44384D-25
300.00	0.49660D-25	350.00	0.53886D-25
400.00	0.57351D-25	450.00	0.60252D-25
500.00	0.62731D-25	550.00	0.64886D-25
600.00	0.66791D-25	650.00	0.68501D-25
700.00	0.70055D-25	750.00	0.71486D-25
800.00	0.72817D-25	850.00	0.74067D-25
900.00	0.75252D-25	950.00	0.76383D-25
1000.0	0.77469D-25	1500.0	0.87057D-25
2000.0	0.95622D-25	2500.0	0.10304D-24
3000.0	0.10811D-24	3500.0	0.10943D-24
4000.0	0.10614D-24	4500.0	0.98535D-25
5000.0	0.87981D-25	5500.0	0.76237D-25
6000.0	0.64759D-25	6500.0	0.54410D-25
7000.0	0.45529D-25	7500.0	0.38123D-25
8000.0	0.32039D-25	8500.0	0.27072D-25
9000.0	0.23021D-25	9500.0	0.19707D-25
10000.	0.16984D-25	15000.	0.52261D-26
20000.	0.23158D-26	25000.	0.12519D-26
30000.	0.76442D-27	35000.	0.50656D-27
40000.	0.35595D-27	45000.	0.26137D-27
50000.	0.19860D-27	55000.	0.15511D-27
60000.	0.12389D-27	65000.	0.10082D-27
70000.	0.83350D-28	75000.	0.69851D-28
80000.	0.59231D-28	85000.	0.50744D-28
90000.	0.43870D-28	95000.	0.38234D-28



Cross Section for $D(d,n)^3He$

$\langle\sigma v\rangle$ For $D(d,n)^3He$ assuming Maxwellian distributions

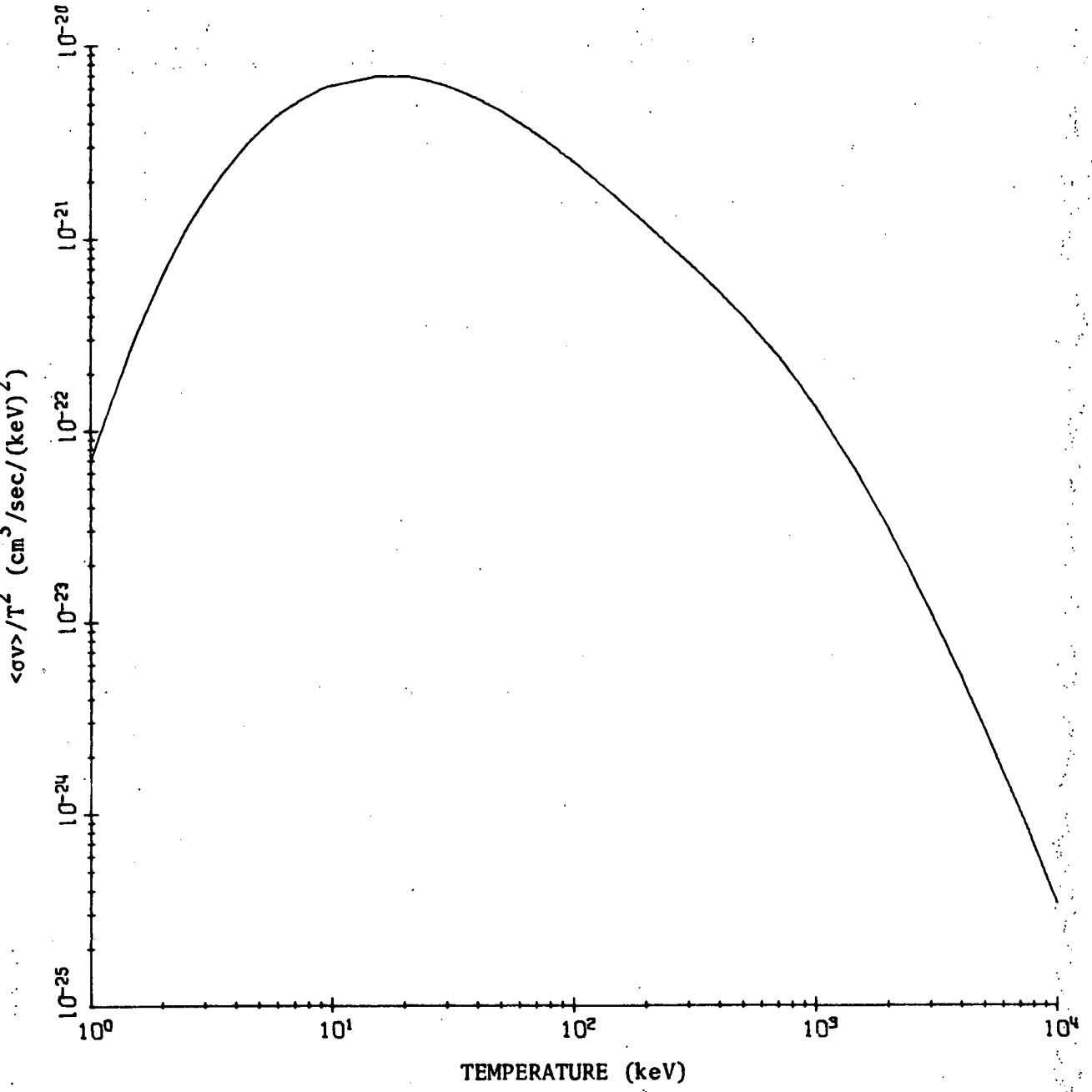
TEMP (keV)	$\langle\sigma v\rangle$ (cm^3/sec)	TEMP (keV)	$\langle\sigma v\rangle$ (cm^3/sec)
1.0000	0.69214D-22	1.5000	0.64652D-21
2.0000	0.26003D-20	2.5000	0.69270D-20
3.0000	0.14529D-19	3.5000	0.26130D-19
4.0000	0.42261D-19	4.5000	0.63283D-19
5.0000	0.89416D-19	5.5000	0.12077D-18
6.0000	0.15736D-18	6.5000	0.19915D-18
7.0000	0.24605D-18	7.5000	0.29792D-18
8.0000	0.35462D-18	8.5000	0.41598D-18
9.0000	0.48182D-18	9.5000	0.55196D-18
10.000	0.62622D-18	15.000	0.15562D-17
20.000	0.27253D-17	25.000	0.40312D-17
30.000	0.54118D-17	35.000	0.68295D-17
40.000	0.82614D-17	45.000	0.96931D-17
50.000	0.11116D-16	55.000	0.12524D-16
60.000	0.13914D-16	65.000	0.15284D-16
70.000	0.16634D-16	75.000	0.17964D-16
80.000	0.19273D-16	85.000	0.20561D-16
90.000	0.21831D-16	95.000	0.23081D-16
100.00	0.24314D-16	150.00	0.35819D-16
200.00	0.46246D-16	250.00	0.55930D-16
300.00	0.64981D-16	350.00	0.73406D-16
400.00	0.81175D-16	450.00	0.88262D-16
500.00	0.94655D-16	550.00	0.10036D-15
600.00	0.10541D-15	650.00	0.10982D-15
700.00	0.11364D-15	750.00	0.11692D-15
800.00	0.11970D-15	850.00	0.12202D-15
900.00	0.12394D-15	950.00	0.12548D-15
1000.0	0.12670D-15	1500.0	0.12709D-15
2000.0	0.11801D-15	2500.0	0.10708D-15
3000.0	0.96635D-16	3500.0	0.87295D-16
4000.0	0.79138D-16	4500.0	0.72061D-16
5000.0	0.65920D-16	5500.0	0.60573D-16
6000.0	0.55895D-16	6500.0	0.51783D-16
7000.0	0.48149D-16	7500.0	0.44920D-16
8000.0	0.42038D-16	8500.0	0.39454D-16
9000.0	0.37126D-16	9500.0	0.35020D-16
10000.	0.33109D-16	15000.	0.20772D-16
20000.	0.14619D-16	25000.	0.11028D-16
30000.	0.87136D-17	35000.	0.71172D-17
40000.	0.59600D-17	45000.	0.50889D-17
50000.	0.44132D-17	55000.	0.38764D-17
60000.	0.34413D-17	65000.	0.30827D-17
70000.	0.27830D-17	75000.	0.25293D-17
80000.	0.23123D-17	85000.	0.21249D-17
90000.	0.19618D-17	95000.	0.18187D-17



Values of <σv> assuming Maxwellian distributions for D-D (neutron branch) fusion reactions

$\langle\sigma v\rangle/T^2$ For $D(d,n)^3He$ assuming Maxwellian distributions

TEMP (keV)	$\langle\sigma v\rangle/T^2$ ($cm^3/sec/(keV)^2$)	TEMP (keV)	$\langle\sigma v\rangle/T^2$ ($cm^3/sec/(keV)^2$)
1.0000	0.69214D-22	1.5000	0.28734D-21
2.0000	0.65008D-21	2.5000	0.11083D-20
3.0000	0.16144D-20	3.5000	0.21331D-20
4.0000	0.26413D-20	4.5000	0.31251D-20
5.0000	0.35767D-20	5.5000	0.39924D-20
6.0000	0.43712D-20	6.5000	0.47137D-20
7.0000	0.50214D-20	7.5000	0.52964D-20
8.0000	0.55410D-20	8.5000	0.57575D-20
9.0000	0.59484D-20	9.5000	0.61160D-20
10.000	0.62622D-20	15.000	0.69164D-20
20.000	0.68132D-20	25.000	0.64499D-20
30.000	0.60131D-20	35.000	0.55751D-20
40.000	0.51634D-20	45.000	0.47867D-20
50.000	0.44463D-20	55.000	0.41401D-20
60.000	0.38650D-20	65.000	0.36176D-20
70.000	0.33948D-20	75.000	0.31936D-20
80.000	0.30114D-20	85.000	0.28459D-20
90.000	0.26951D-20	95.000	0.25575D-20
100.00	0.24314D-20	150.00	0.15920D-20
200.00	0.11562D-20	250.00	0.89488D-21
300.00	0.72201D-21	350.00	0.59923D-21
400.00	0.50734D-21	450.00	0.43586D-21
500.00	0.37862D-21	550.00	0.33178D-21
600.00	0.29279D-21	650.00	0.25992D-21
700.00	0.23192D-21	750.00	0.20786D-21
800.00	0.18703D-21	850.00	0.16889D-21
900.00	0.15301D-21	950.00	0.13904D-21
1000.0	0.12670D-21	1500.0	0.56484D-22
2000.0	0.29504D-22	2500.0	0.17134D-22
3000.0	0.10737D-22	3500.0	0.71261D-23
4000.0	0.49461D-23	4500.0	0.35586D-23
5000.0	0.26368D-23	5500.0	0.20024D-23
6000.0	0.15526D-23	6500.0	0.12256D-23
7000.0	0.98263D-24	7500.0	0.79858D-24
8000.0	0.65685D-24	8500.0	0.54607D-24
9000.0	0.45834D-24	9500.0	0.38803D-24
10000.	0.33109D-24	15000.	0.92319D-25
20000.	0.36548D-25	25000.	0.17645D-25
30000.	0.96818D-26	35000.	0.58100D-26
40000.	0.37250D-26	45000.	0.25130D-26
50000.	0.17653D-26	55000.	0.12815D-26
60000.	0.95592D-27	65000.	0.72964D-27
70000.	0.56795D-27	75000.	0.44965D-27
80000.	0.36130D-27	85000.	0.29411D-27
90000.	0.24220D-27	95000.	0.20152D-27



Values of $<\sigma v>/T^2$ assuming Maxwellian distributions for D-D (neutron branch) reactions

$\langle\sigma v\rangle_b$ For D(d,n)^{3}He assuming beam-Maxwellian distributions

Deuterium Temperature = 0

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.52749D-21	15.000	0.69407D-20
20.000	0.31540D-19	25.000	0.87486D-19
30.000	0.18424D-18	35.000	0.32676D-18
40.000	0.51639D-18	45.000	0.75198D-18
50.000	0.10309D-17	55.000	0.13496D-17
60.000	0.17043D-17	65.000	0.20911D-17
70.000	0.25063D-17	75.000	0.29464D-17
80.000	0.34081D-17	85.000	0.38885D-17
90.000	0.43848D-17	95.000	0.48948D-17
100.00	0.54163D-17	110.00	0.64865D-17
120.00	0.75827D-17	130.00	0.86951D-17
140.00	0.98161D-17	150.00	0.10940D-16
160.00	0.12062D-16	170.00	0.13178D-16
180.00	0.14287D-16	190.00	0.15386D-16
200.00	0.16474D-16	250.00	0.21717D-16
300.00	0.26618D-16	350.00	0.31198D-16
400.00	0.35456D-16	450.00	0.39554D-16
500.00	0.43408D-16	550.00	0.47091D-16
600.00	0.50630D-16	650.00	0.54046D-16
700.00	0.57359D-16	750.00	0.60584D-16
800.00	0.63736D-16	850.00	0.66826D-16
900.00	0.69863D-16	950.00	0.72856D-16
1000.0	0.75812D-16	1100.0	0.81637D-16
1200.0	0.87378D-16	1300.0	0.93063D-16
1400.0	0.98713D-16	1500.0	0.10434D-15
1600.0	0.10996D-15	1700.0	0.11557D-15
1800.0	0.12117D-15	1900.0	0.12677D-15
2000.0	0.13234D-15	3000.0	0.18325D-15
4000.0	0.20774D-15	5000.0	0.19252D-15
6000.0	0.15523D-15	7000.0	0.11788D-15
8000.0	0.88682D-16	9000.0	0.67585D-16
10000.	0.52560D-16		

$\langle\sigma v\rangle_b$ For $D(d,n)^3He$ assuming beam-Maxwellian distributions

Deuterium Temperature = 10 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle$ (cm^3/sec)
10.000	0.35092D-18	15.000	0.53352D-18
20.000	0.74945D-18	25.000	0.99724D-18
30.000	0.12752D-17	35.000	0.15814D-17
40.000	0.19139D-17	45.000	0.22708D-17
50.000	0.26499D-17	55.000	0.30493D-17
60.000	0.34672D-17	65.000	0.39017D-17
70.000	0.43512D-17	75.000	0.48140D-17
80.000	0.52887D-17	85.000	0.57738D-17
90.000	0.62680D-17	95.000	0.67702D-17
100.00	0.72793D-17	110.00	0.83140D-17
120.00	0.93652D-17	130.00	0.10427D-16
140.00	0.11495D-16	150.00	0.12564D-16
160.00	0.13632D-16	170.00	0.14696D-16
180.00	0.15755D-16	190.00	0.16806D-16
200.00	0.17848D-16	250.00	0.22900D-16
300.00	0.27665D-16	350.00	0.32148D-16
400.00	0.36379D-16	450.00	0.40390D-16
500.00	0.44212D-16	550.00	0.47872D-16
600.00	0.51396D-16	650.00	0.54804D-16
700.00	0.58112D-16	750.00	0.61337D-16
800.00	0.64491D-16	850.00	0.67585D-16
900.00	0.70627D-16	950.00	0.73627D-16
1000.0	0.76591D-16	1100.0	0.82432D-16
1200.0	0.88188D-16	1300.0	0.93888D-16
1400.0	0.99551D-16	1500.0	0.10519D-15
1600.0	0.11081D-15	1700.0	0.11642D-15
1800.0	0.12201D-15	1900.0	0.12759D-15
2000.0	0.13313D-15	3000.0	0.18309D-15
4000.0	0.20615D-15	5000.0	0.19103D-15
6000.0	0.15474D-15	7000.0	0.11801D-15
8000.0	0.88980D-16	9000.0	0.67876D-16
10000.	0.52798D-16		

$\langle\sigma v\rangle_b$ For $D(d,n)^3He$ assuming beam-Maxwellian distributions

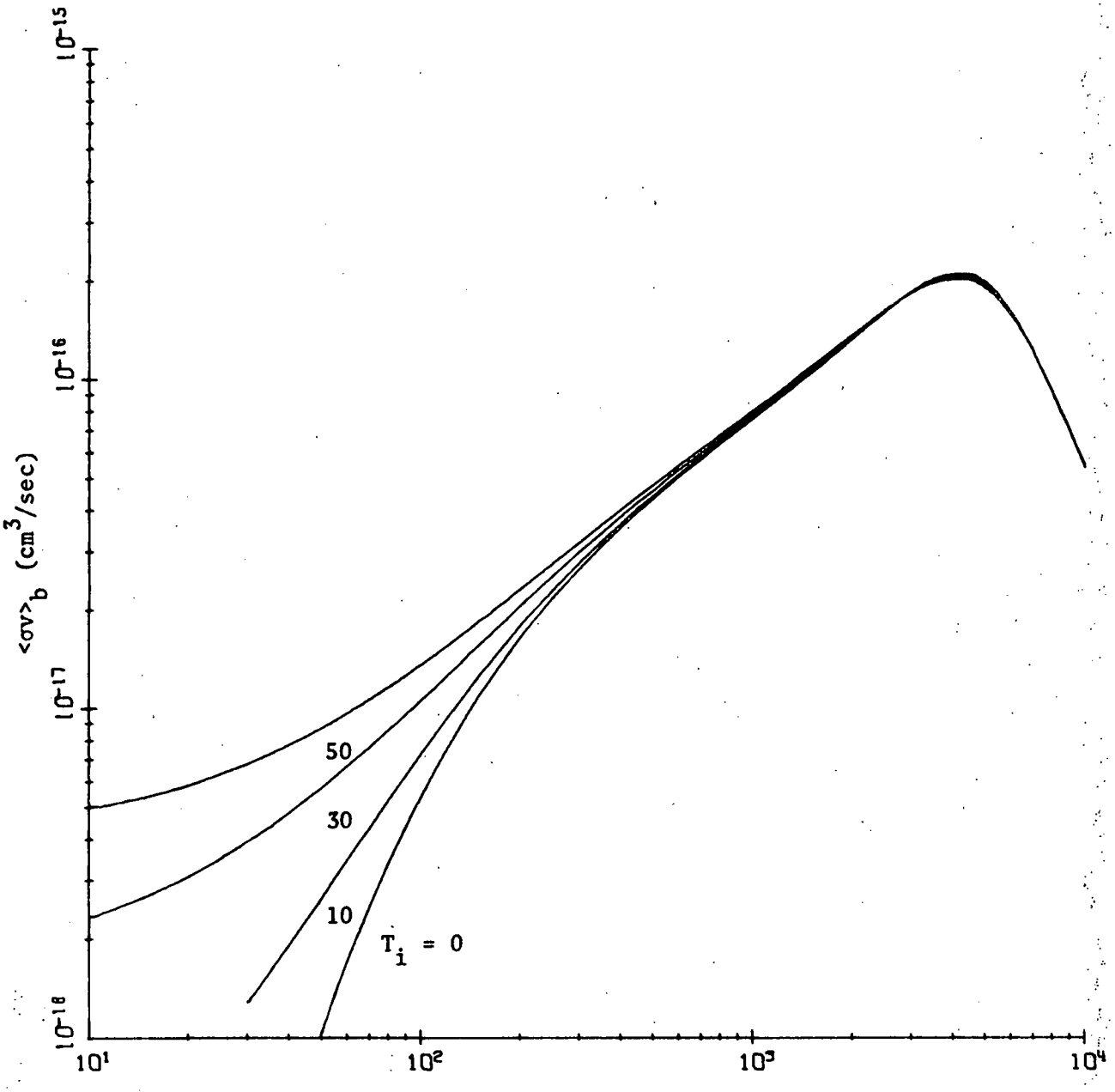
Deuterium Temperature = 30 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.23002D-17	15.000	0.26926D-17
20.000	0.30973D-17	25.000	0.35132D-17
30.000	0.39394D-17	35.000	0.43750D-17
40.000	0.48192D-17	45.000	0.52712D-17
50.000	0.57302D-17	55.000	0.61955D-17
60.000	0.66666D-17	65.000	0.71427D-17
70.000	0.76233D-17	75.000	0.81080D-17
80.000	0.85960D-17	85.000	0.90871D-17
90.000	0.95808D-17	95.000	0.10077D-16
100.00	0.10574D-16	110.00	0.11574D-16
120.00	0.12576D-16	130.00	0.13580D-16
140.00	0.14583D-16	150.00	0.15583D-16
160.00	0.16580D-16	170.00	0.17572D-16
180.00	0.18558D-16	190.00	0.19538D-16
200.00	0.20511D-16	250.00	0.25252D-16
300.00	0.29773D-16	350.00	0.34074D-16
400.00	0.38170D-16	450.00	0.42083D-16
500.00	0.45835D-16	550.00	0.49447D-16
600.00	0.52937D-16	650.00	0.56323D-16
700.00	0.59620D-16	750.00	0.62840D-16
800.00	0.65994D-16	850.00	0.69091D-16
900.00	0.72141D-16	950.00	0.75150D-16
1000.0	0.78125D-16	1100.0	0.83990D-16
1200.0	0.89771D-16	1300.0	0.95492D-16
1400.0	0.10117D-15	1500.0	0.10681D-15
1600.0	0.11243D-15	1700.0	0.11802D-15
1800.0	0.12358D-15	1900.0	0.12910D-15
2000.0	0.13457D-15	3000.0	0.18256D-15
4000.0	0.20305D-15	5000.0	0.18812D-15
6000.0	0.15365D-15	7000.0	0.11813D-15
8000.0	0.89498D-16	9000.0	0.68415D-16
10000.	0.53249D-16		

$\langle\sigma v\rangle_b$ For $D(d,n)^3He$ assuming beam-Maxwellian distributions

Deuterium Temperature = 50 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.49420D-17	15.000	0.54032D-17
20.000	0.58681D-17	25.000	0.63362D-17
30.000	0.68073D-17	35.000	0.72810D-17
40.000	0.77569D-17	45.000	0.82348D-17
50.000	0.87145D-17	55.000	0.91956D-17
60.000	0.96780D-17	65.000	0.10161D-16
70.000	0.10645D-16	75.000	0.11130D-16
80.000	0.11615D-16	85.000	0.12101D-16
90.000	0.12586D-16	95.000	0.13071D-16
100.00	0.13556D-16	110.00	0.14525D-16
120.00	0.15491D-16	130.00	0.16454D-16
140.00	0.17413D-16	150.00	0.18367D-16
160.00	0.19316D-16	170.00	0.20258D-16
180.00	0.21195D-16	190.00	0.22125D-16
200.00	0.23049D-16	250.00	0.27559D-16
300.00	0.31883D-16	350.00	0.36027D-16
400.00	0.40000D-16	450.00	0.43820D-16
500.00	0.47502D-16	550.00	0.51063D-16
600.00	0.54518D-16	650.00	0.57879D-16
700.00	0.61160D-16	750.00	0.64371D-16
800.00	0.67522D-16	850.00	0.70621D-16
900.00	0.73675D-16	950.00	0.76690D-16
1000.0	0.79671D-16	1100.0	0.85553D-16
1200.0	0.91350D-16	1300.0	0.97081D-16
1400.0	0.10276D-15	1500.0	0.10840D-15
1600.0	0.11400D-15	1700.0	0.11955D-15
1800.0	0.12506D-15	1900.0	0.13052D-15
2000.0	0.13590D-15	3000.0	0.18191D-15
4000.0	0.20017D-15	5000.0	0.18541D-15
6000.0	0.15252D-15	7000.0	0.11815D-15
8000.0	0.89963D-16	9000.0	0.68933D-16
10000.	0.53694D-16		



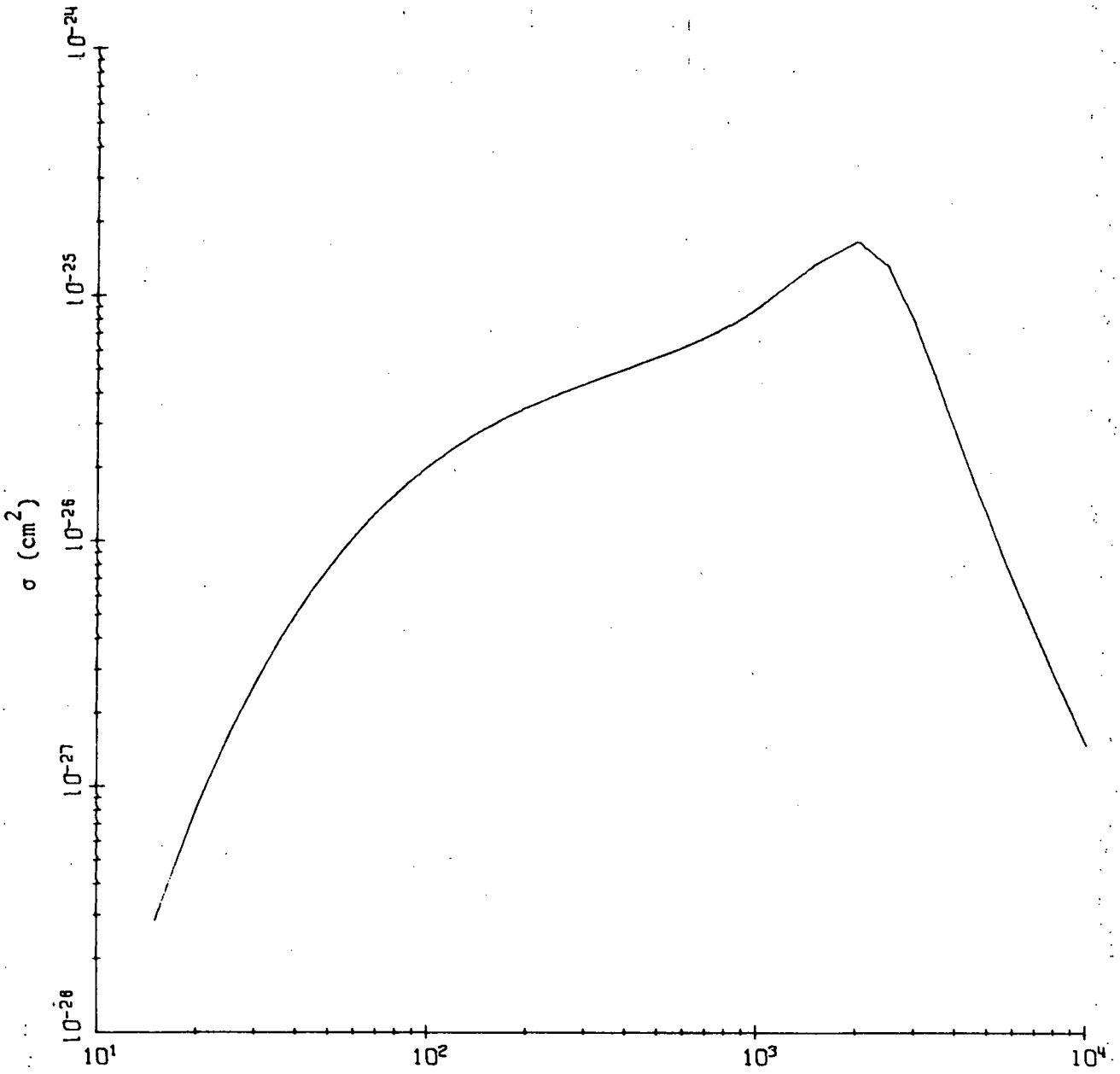
Values of $\langle\sigma v\rangle_b$ (neutron branch) for injection of deuterium into a deuterium background at various temperatures (keV)

Section 5

Tritium-Tritium Reactions

Cross Section For $T(t,2n)^4He$

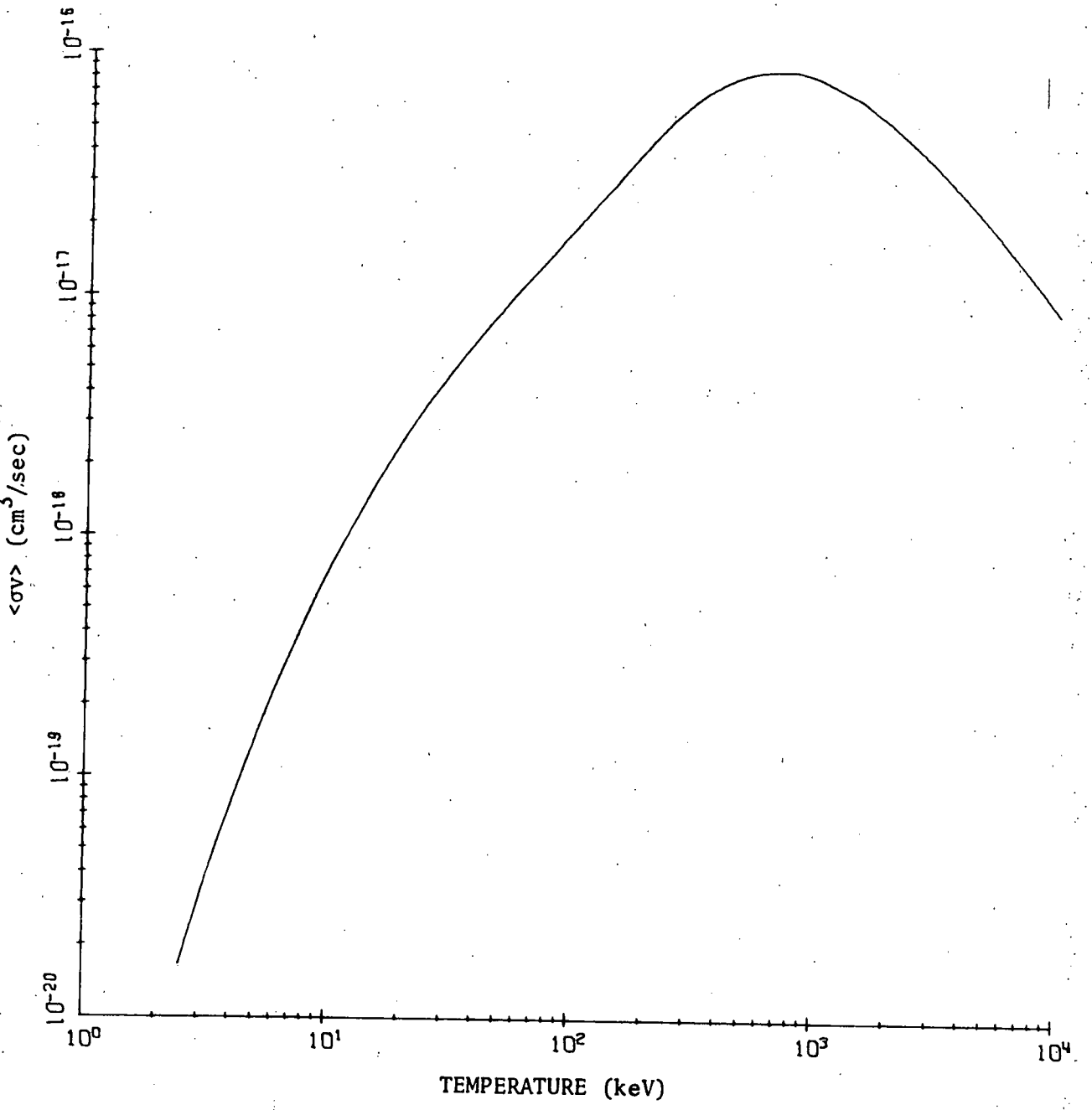
ENERGY (keV)	σ (cm^2)	ENERGY (keV)	σ (cm^2)
1.0000	0.17751D-38	1.5000	0.13576D-35
2.0000	0.67892D-34	2.5000	0.95436D-33
3.0000	0.65986D-32	3.5000	0.29290D-31
4.0000	0.96490D-31	4.5000	0.25720D-30
5.0000	0.58615D-30	5.5000	0.11852D-29
6.0000	0.21818D-29	6.5000	0.37262D-29
7.0000	0.59859D-29	7.5000	0.91415D-29
8.0000	0.13381D-28	8.5000	0.18894D-28
9.0000	0.25870D-28	9.5000	0.34492D-28
10.000	0.44934D-28	15.000	0.27908D-27
20.000	0.79309D-27	25.000	0.15771D-26
30.000	0.25772D-26	35.000	0.37326D-26
40.000	0.49902D-26	45.000	0.63080D-26
50.000	0.76545D-26	55.000	0.90065D-26
60.000	0.10348D-25	65.000	0.11666D-25
70.000	0.12955D-25	75.000	0.14209D-25
80.000	0.15425D-25	85.000	0.16602D-25
90.000	0.17738D-25	95.000	0.18834D-25
100.00	0.19892D-25	150.00	0.28597D-25
200.00	0.34866D-25	250.00	0.39698D-25
300.00	0.43675D-25	350.00	0.47133D-25
400.00	0.50278D-25	450.00	0.53241D-25
500.00	0.56112D-25	550.00	0.58952D-25
600.00	0.61808D-25	650.00	0.64714D-25
700.00	0.67697D-25	750.00	0.70781D-25
800.00	0.73983D-25	850.00	0.77319D-25
900.00	0.80801D-25	950.00	0.84441D-25
1000.0	0.88244D-25	1500.0	0.13418D-24
2000.0	0.16436D-24	2500.0	0.12805D-24
3000.0	0.75760D-25	3500.0	0.43922D-25
4000.0	0.27045D-25	4500.0	0.17780D-25
5000.0	0.12353D-25	5500.0	0.89710D-26
6000.0	0.67510D-26	6500.0	0.52290D-26
7000.0	0.41475D-26	7500.0	0.33554D-26
8000.0	0.27604D-26	8500.0	0.23037D-26
9000.0	0.19465D-26	9500.0	0.16626D-26
10000.	0.14336D-26	15000.	0.46226D-27
20000.	0.21360D-27	25000.	0.11877D-27
30000.	0.73952D-28	35000.	0.49703D-28
40000.	0.35298D-28	45000.	0.26133D-28
50000.	0.19989D-28	55000.	0.15695D-28
60000.	0.12591D-28	65000.	0.10285D-28
70000.	0.85298D-29	75000.	0.71679D-29
80000.	0.60925D-29	85000.	0.52304D-29
90000.	0.45302D-29	95000.	0.39547D-29



Cross Section for $T(t,2n)^4He$

$\langle\sigma v\rangle$ For $T(t,2n)^4He$ assuming Maxwellian distributions

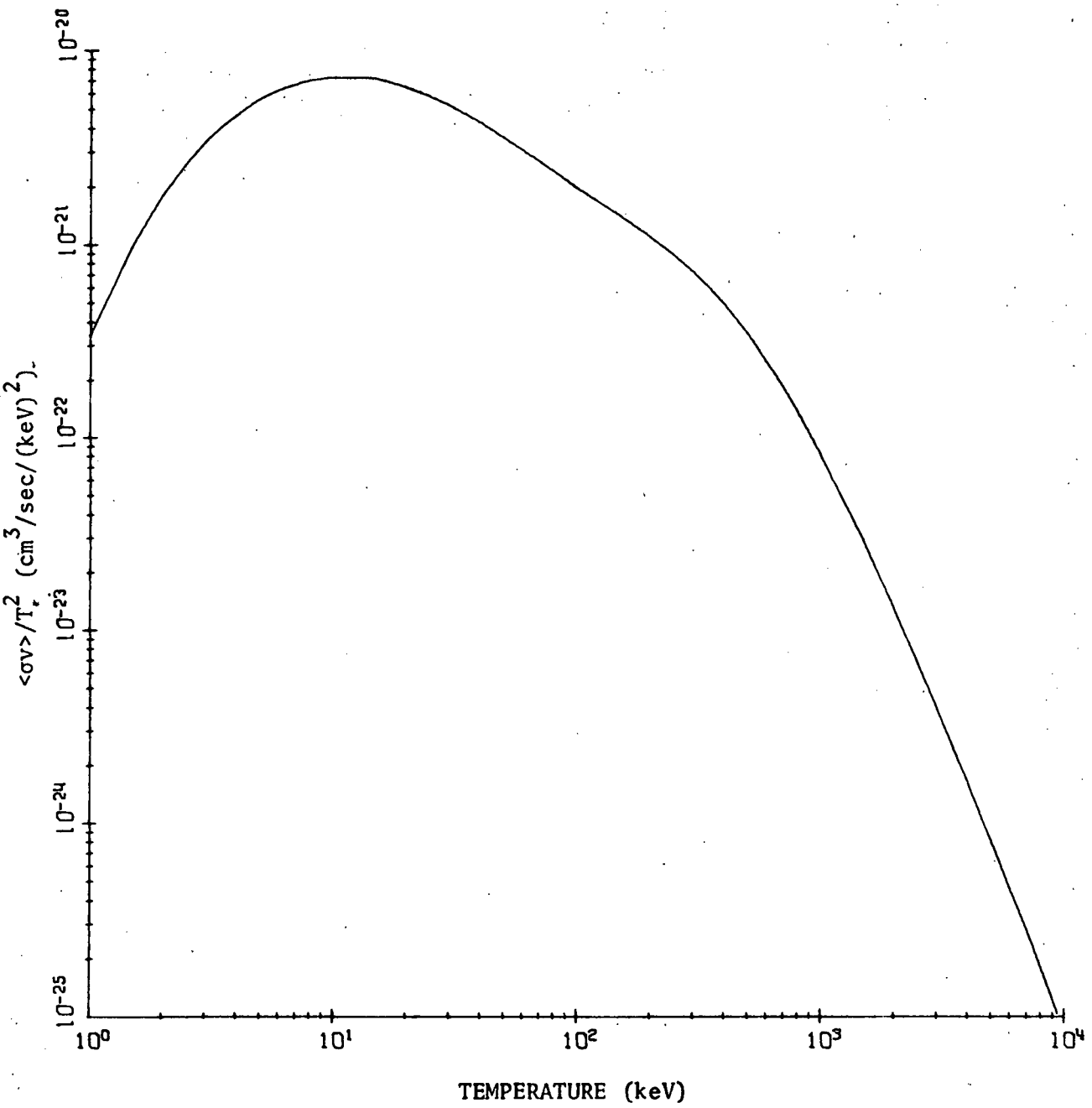
TEMP (keV)	$\langle\sigma v\rangle$ (cm^3/sec)	TEMP (keV)	$\langle\sigma v\rangle$ (cm^3/sec)
1.0000	0.32834D-21	1.5000	0.21835D-20
2.0000	0.70908D-20	2.5000	0.16229D-19
3.0000	0.30327D-19	3.5000	0.49752D-19
4.0000	0.74610D-19	4.5000	0.10484D-18
5.0000	0.14026D-18	5.5000	0.18065D-18
6.0000	0.22573D-18	6.5000	0.27522D-18
7.0000	0.32883D-18	7.5000	0.38629D-18
8.0000	0.44732D-18	8.5000	0.51166D-18
9.0000	0.57906D-18	9.5000	0.64931D-18
10.000	0.72219D-18	15.000	0.15584D-17
20.000	0.25106D-17	25.000	0.35141D-17
30.000	0.45386D-17	35.000	0.55697D-17
40.000	0.66007D-17	45.000	0.76292D-17
50.000	0.86548D-17	55.000	0.96784D-17
60.000	0.10702D-16	65.000	0.11726D-16
70.000	0.12754D-16	75.000	0.13787D-16
80.000	0.14826D-16	85.000	0.15874D-16
90.000	0.16932D-16	95.000	0.18001D-16
100.00	0.19082D-16	150.00	0.30519D-16
200.00	0.42438D-16	250.00	0.53578D-16
300.00	0.63106D-16	350.00	0.70748D-16
400.00	0.76571D-16	450.00	0.80798D-16
500.00	0.83694D-16	550.00	0.85510D-16
600.00	0.86471D-16	650.00	0.86761D-16
700.00	0.86532D-16	750.00	0.85904D-16
800.00	0.84975D-16	850.00	0.83820D-16
900.00	0.82499D-16	950.00	0.81059D-16
1000.0	0.79538D-16	1500.0	0.63893D-16
2000.0	0.51343D-16	2500.0	0.42094D-16
3000.0	0.35227D-16	3500.0	0.30014D-16
4000.0	0.25962D-16	4500.0	0.22745D-16
5000.0	0.20143D-16	5500.0	0.18004D-16
6000.0	0.16220D-16	6500.0	0.14715D-16
7000.0	0.13431D-16	7500.0	0.12325D-16
8000.0	0.11364D-16	8500.0	0.10523D-16
9000.0	0.97821D-17	9500.0	0.91248D-17
10000.	0.85387D-17	15000.	0.49913D-17
20000.	0.33734D-17	25000.	0.24773D-17
30000.	0.19198D-17	35000.	0.15450D-17
40000.	0.12787D-17	45000.	0.10813D-17
50000.	0.93025D-18	55000.	0.81149D-18
60000.	0.71614D-18	65000.	0.63820D-18
70000.	0.57349D-18	75000.	0.51906D-18
80000.	0.47275D-18	85000.	0.43296D-18
90000.	0.39851D-18	95000.	0.36852D-18



Values of <σv> assuming Maxwellian distributions for T-T fusion reactions.

$\langle\sigma v\rangle/T^2$ For $T(t,2n)^4He$ assuming Maxwellian distributions

TEMP (keV)	$\langle\sigma v\rangle/T^2$ ($cm^3/sec/(keV)^2$)	TEMP (keV)	$\langle\sigma v\rangle/T^2$ ($cm^3/sec/(keV)^2$)
1.0000	0.32834D-21	1.5000	0.97046D-21
2.0000	0.17727D-20	2.5000	0.25966D-20
3.0000	0.33697D-20	3.5000	0.40614D-20
4.0000	0.46631D-20	4.5000	0.51771D-20
5.0000	0.56104D-20	5.5000	0.59718D-20
6.0000	0.62703D-20	6.5000	0.65141D-20
7.0000	0.67109D-20	7.5000	0.68674D-20
8.0000	0.69893D-20	8.5000	0.70817D-20
9.0000	0.71489D-20	9.5000	0.71946D-20
10.000	0.72219D-20	15.000	0.69263D-20
20.000	0.62764D-20	25.000	0.56225D-20
30.000	0.50429D-20	35.000	0.45467D-20
40.000	0.41255D-20	45.000	0.37675D-20
50.000	0.34619D-20	55.000	0.31995D-20
60.000	0.29727D-20	65.000	0.27754D-20
70.000	0.26028D-20	75.000	0.24510D-20
80.000	0.23166D-20	85.000	0.21972D-20
90.000	0.20904D-20	95.000	0.19946D-20
100.00	0.19082D-20	150.00	0.13564D-20
200.00	0.10609D-20	250.00	0.85725D-21
300.00	0.70118D-21	350.00	0.57753D-21
400.00	0.47857D-21	450.00	0.39900D-21
500.00	0.33477D-21	550.00	0.28268D-21
600.00	0.24020D-21	650.00	0.20535D-21
700.00	0.17660D-21	750.00	0.15272D-21
800.00	0.13277D-21	850.00	0.11601D-21
900.00	0.10185D-21	950.00	0.89817D-22
1000.0	0.79538D-22	1500.0	0.28397D-22
2000.0	0.12836D-22	2500.0	0.67350D-23
3000.0	0.39142D-23	3500.0	0.24501D-23
4000.0	0.16226D-23	4500.0	0.11232D-23
5000.0	0.80571D-24	5500.0	0.59517D-24
6000.0	0.45057D-24	6500.0	0.34829D-24
7000.0	0.27411D-24	7500.0	0.21911D-24
8000.0	0.17757D-24	8500.0	0.14565D-2
9000.0	0.12077D-24	9500.0	0.10111D-24
10000.	0.85387D-25	15000.	0.22183D-25
20000.	0.84335D-26	25000.	0.39637D-26
30000.	0.21331D-26	35000.	0.12613D-26
40000.	0.79919D-27	45000.	0.53399D-27
50000.	0.37210D-27	55000.	0.26826D-27
60000.	0.19893D-27	65000.	0.15105D-27
70000.	0.11704D-27	75000.	0.92278D-28
80000.	0.73867D-28	85000.	0.59925D-28
90000.	0.49199D-28	95000.	0.40833D-28



Values of $<\sigma v>/T^2$ assuming Maxwellian distributions for T-T reactions

$\langle\sigma v\rangle_b$ For $T(t,2n)^4He$ assuming beam-Maxwellian distributions

Tritium Temperature = 0

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.35934D-20	15.000	0.27334D-19
20.000	0.85696D-19	25.000	0.19942D-18
30.000	0.35697D-18	35.000	0.55843D-18
40.000	0.79814D-18	45.000	0.10701D-17
50.000	0.13688D-17	55.000	0.16892D-17
60.000	0.20270D-17	65.000	0.23786D-17
70.000	0.27411D-17	75.000	0.31120D-17
80.000	0.34891D-17	85.000	0.38707D-17
90.000	0.42556D-17	95.000	0.46424D-17
100.00	0.50304D-17	110.00	0.58067D-17
120.00	0.65800D-17	130.00	0.73473D-17
140.00	0.81067D-17	150.00	0.88573D-17
160.00	0.95986D-17	170.00	0.10330D-16
180.00	0.11052D-16	190.00	0.11765D-16
200.00	0.12469D-16	250.00	0.15874D-16
300.00	0.19130D-16	350.00	0.22299D-16
400.00	0.25430D-16	450.00	0.28562D-16
500.00	0.31730D-16	550.00	0.34963D-16
600.00	0.38287D-16	650.00	0.41724D-16
700.00	0.45255D-16	750.00	0.49021D-16
800.00	0.52919D-16	850.00	0.57007D-16
900.00	0.61302D-16	950.00	0.65818D-16
1000.0	0.70570D-16	1100.0	0.80822D-16
1200.0	0.92112D-16	1300.0	0.10442D-15
1400.0	0.11762D-15	1500.0	0.13142D-15
1600.0	0.14533D-15	1700.0	0.15864D-15
1800.0	0.17046D-15	1900.0	0.17984D-15
2000.0	0.18589D-15	3000.0	0.10494D-15
4000.0	0.43256D-16	5000.0	0.22089D-16
6000.0	0.13224D-16	7000.0	0.87753D-17
8000.0	0.62439D-17	9000.0	0.46700D-17
10000.	0.36255D-17		

$\langle\sigma v\rangle_b$ For $T(t,2n)^4He$ assuming beam-Maxwellian distributions

Tritium Temperature = 10 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.45610D-18	15.000	0.65701D-18
20.000	0.88291D-18	25.000	0.11311D-17
30.000	0.13989D-17	35.000	0.16840D-17
40.000	0.19841D-17	45.000	0.22971D-17
50.000	0.26213D-17	55.000	0.29548D-17
60.000	0.32963D-17	65.000	0.36444D-17
70.000	0.39980D-17	75.000	0.43559D-17
80.000	0.47173D-17	85.000	0.50814D-17
90.000	0.54475D-17	95.000	0.58151D-17
100.00	0.61835D-17	110.00	0.69213D-17
120.00	0.76580D-17	130.00	0.83917D-17
140.00	0.91210D-17	150.00	0.98448D-17
160.00	0.10562D-16	170.00	0.11274D-16
180.00	0.11979D-16	190.00	0.12677D-16
200.00	0.13369D-16	250.00	0.16744D-16
300.00	0.20010D-16	350.00	0.23214D-16
400.00	0.26399D-16	450.00	0.29601D-16
500.00	0.32852D-16	550.00	0.36181D-16
600.00	0.39611D-16	650.00	0.43165D-16
700.00	0.46864D-16	750.00	0.50727D-16
800.00	0.54771D-16	850.00	0.59012D-16
900.00	0.63464D-16	950.00	0.68138D-16
1000.0	0.73045D-16	1100.0	0.83574D-16
1200.0	0.95041D-16	1300.0	0.10733D-15
1400.0	0.12021D-15	1500.0	0.13328D-15
1600.0	0.14597D-15	1700.0	0.15762D-15
1800.0	0.16748D-15	1900.0	0.17488D-15
2000.0	0.17932D-15	3000.0	0.10583D-15
4000.0	0.44217D-16	5000.0	0.22454D-16
6000.0	0.13384D-16	7000.0	0.88563D-17
8000.0	0.62899D-17	9000.0	0.46985D-17
10000.	0.36444D-17		

$\langle\sigma v\rangle_b$ For $T(t,2n)^4He$ assuming beam-Maxwellian distributions

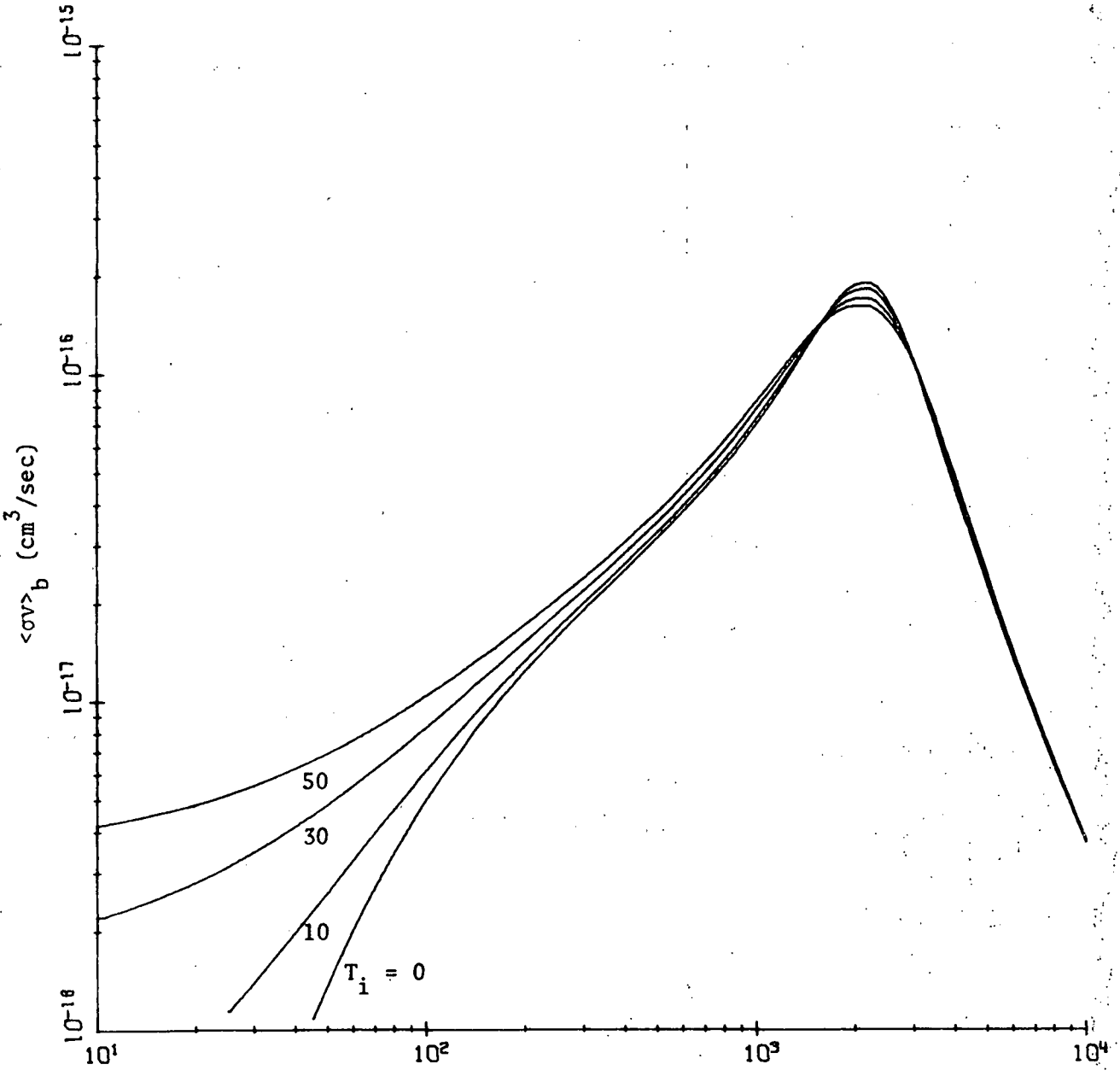
Tritium Temperature = 30 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.21786D-17	15.000	0.24977D-17
20.000	0.28219D-17	25.000	0.31506D-17
30.000	0.34832D-17	35.000	0.38194D-17
40.000	0.41585D-17	45.000	0.45002D-17
50.000	0.48440D-17	55.000	0.51897D-17
60.000	0.55369D-17	65.000	0.58853D-17
70.000	0.62347D-17	75.000	0.65848D-17
80.000	0.69355D-17	85.000	0.72864D-17
90.000	0.76376D-17	95.000	0.79888D-17
100.00	0.83398D-17	110.00	0.90412D-17
120.00	0.97409D-17	130.00	0.10438D-16
140.00	0.11133D-16	150.00	0.11825D-16
160.00	0.12514D-16	170.00	0.13199D-16
180.00	0.13882D-16	190.00	0.14561D-16
200.00	0.15237D-16	250.00	0.18578D-16
300.00	0.21874D-16	350.00	0.25157D-16
400.00	0.28459D-16	450.00	0.31810D-16
500.00	0.35237D-16	550.00	0.38766D-16
600.00	0.42417D-16	650.00	0.46211D-16
700.00	0.50165D-16	750.00	0.54294D-16
800.00	0.58610D-16	850.00	0.63121D-16
900.00	0.67834D-16	950.00	0.72749D-16
1000.0	0.77863D-16	1100.0	0.88643D-16
1200.0	0.10003D-15	1300.0	0.11177D-15
1400.0	0.12351D-15	1500.0	0.13481D-15
1600.0	0.14518D-15	1700.0	0.15414D-15
1800.0	0.16126D-15	1900.0	0.16621D-15
2000.0	0.16880D-15	3000.0	0.10621D-15
4000.0	0.46116D-16	5000.0	0.23213D-16
6000.0	0.13712D-16	7000.0	0.90205D-17
8000.0	0.63822D-17	9000.0	0.47550D-17
10000.	0.36813D-17		

$\langle\sigma v\rangle_b$ For $T(t,2n)^4He$ assuming beam-Maxwellian distributions

Tritium Temperature = 50 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.41956D-17	15.000	0.45375D-17
20.000	0.48803D-17	25.000	0.52237D-17
30.000	0.55677D-17	35.000	0.59122D-17
40.000	0.62570D-17	45.000	0.66020D-17
50.000	0.69471D-17	55.000	0.72924D-17
60.000	0.76376D-17	65.000	0.79827D-17
70.000	0.83278D-17	75.000	0.86726D-17
80.000	0.90173D-17	85.000	0.93617D-17
90.000	0.97058D-17	95.000	0.10050D-16
100.00	0.10393D-16	110.00	0.11079D-16
120.00	0.11763D-16	130.00	0.12445D-16
140.00	0.13126D-16	150.00	0.13806D-16
160.00	0.14483D-16	170.00	0.15159D-16
180.00	0.15834D-16	190.00	0.16508D-16
200.00	0.17180D-16	250.00	0.20532D-16
300.00	0.23886D-16	350.00	0.27267D-16
400.00	0.30701D-16	450.00	0.34213D-16
500.00	0.37826D-16	550.00	0.41559D-16
600.00	0.45429D-16	650.00	0.49450D-16
700.00	0.53633D-16	750.00	0.57985D-16
800.00	0.62510D-16	850.00	0.67206D-16
900.00	0.72068D-16	950.00	0.77085D-16
1000.0	0.82241D-16	1100.0	0.92882D-16
1200.0	0.10376D-15	1300.0	0.11459D-15
1400.0	0.12500D-15	1500.0	0.13464D-15
1600.0	0.14315D-15	1700.0	0.15019D-15
1800.0	0.15553D-15	1900.0	0.15901D-15
2000.0	0.16056D-15	3000.0	0.10551D-15
4000.0	0.47906D-16	5000.0	0.24021D-16
6000.0	0.14062D-16	7000.0	0.91938D-17
8000.0	0.64786D-17	9000.0	0.48136D-17
10000.	0.37194D-17		



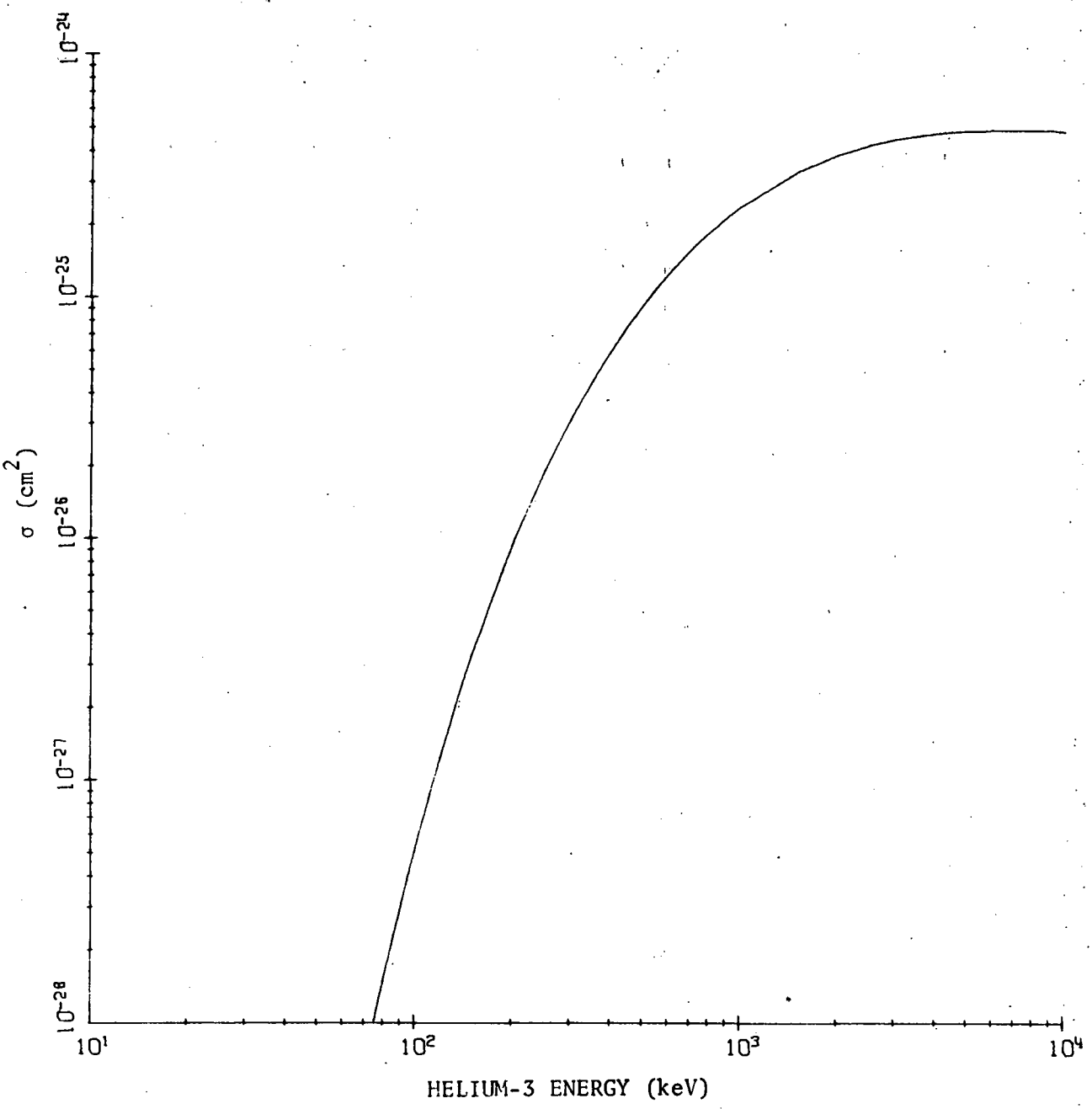
Values of $\langle\sigma v\rangle_b$ for injection of tritium into a tritium background at various temperature (keV)

Section 6

Tritium-Helium-3 Reactions

Cross Section For $T(^3He,X)Y$

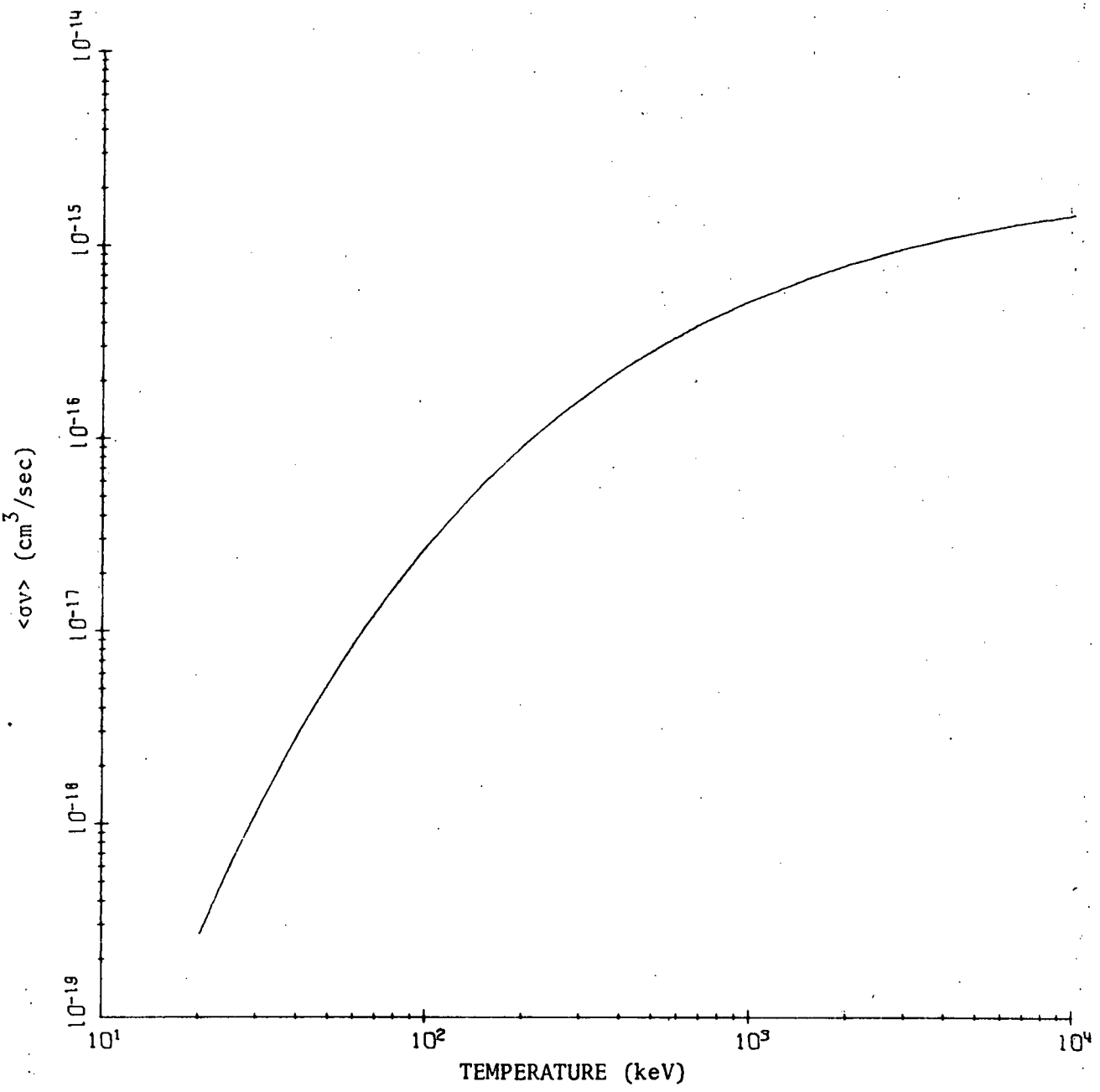
ENERGY (keV)	σ (cm^2)	ENERGY (keV)	σ (cm^2)
1.0000	0.38571D-73	1.5000	0.16640D-63
2.0000	0.88051D-58	2.5000	0.69031D-54
3.0000	0.50823D-51	3.5000	0.84898D-49
4.0000	0.52077D-47	4.5000	0.15644D-45
5.0000	0.27667D-44	5.5000	0.32605D-43
6.0000	0.27929D-42	6.5000	0.18517D-41
7.0000	0.99592D-41	7.5000	0.45027D-40
8.0000	0.17594D-39	8.5000	0.60733D-39
9.0000	0.18849D-38	9.5000	0.53349D-38
10.000	0.13934D-37	15.000	0.11762D-34
20.000	0.62375D-33	25.000	0.91250D-32
30.000	0.64971D-31	35.000	0.29503D-30
40.000	0.98981D-30	45.000	0.26783D-29
50.000	0.61817D-29	55.000	0.12635D-28
60.000	0.23481D-28	65.000	0.40433D-28
70.000	0.65430D-28	75.000	0.10058D-27
80.000	0.14808D-27	85.000	0.21021D-27
90.000	0.28921D-27	95.000	0.38730D-27
100.00	0.50660D-27	150.00	0.32336D-26
200.00	0.93251D-26	250.00	0.18706D-25
300.00	0.30732D-25	350.00	0.44655D-25
400.00	0.59810D-25	450.00	0.75665D-25
500.00	0.91818D-25	550.00	0.10798D-24
600.00	0.12393D-24	650.00	0.13953D-24
700.00	0.15468D-24	750.00	0.16932D-24
800.00	0.18341D-24	850.00	0.19693D-24
900.00	0.20988D-24	950.00	0.22227D-24
1000.0	0.23409D-24	1500.0	0.32589D-24
2000.0	0.38302D-24	2500.0	0.41939D-24
3000.0	0.44299D-24	3500.0	0.45842D-24
4000.0	0.46843D-24	4500.0	0.47472D-24
5000.0	0.47841D-24	5500.0	0.48024D-24
6000.0	0.48072D-24	6500.0	0.48021D-24
7000.0	0.47897D-24	7500.0	0.47719D-24
8000.0	0.47500D-24	8500.0	0.47251D-24
9000.0	0.46979D-24	9500.0	0.46692D-24
10000.	0.46394D-24	15000.	0.43293D-24
20000.	0.40523D-24	25000.	0.38187D-24
30000.	0.36213D-24	35000.	0.34525D-24
40000.	0.33063D-24	45000.	0.31781D-24
50000.	0.30645D-24	55000.	0.29630D-24
60000.	0.28714D-24	65000.	0.27883D-24
70000.	0.27125D-24	75000.	0.26429D-24
80000.	0.25786D-24	85000.	0.25191D-24
90000.	0.24637D-24	95000.	0.24121D-24



Cross Section for T(^{3}He,X)Y

$\langle\sigma v\rangle$ For $T(^3He,X)Y$ assuming Maxwellian distributions

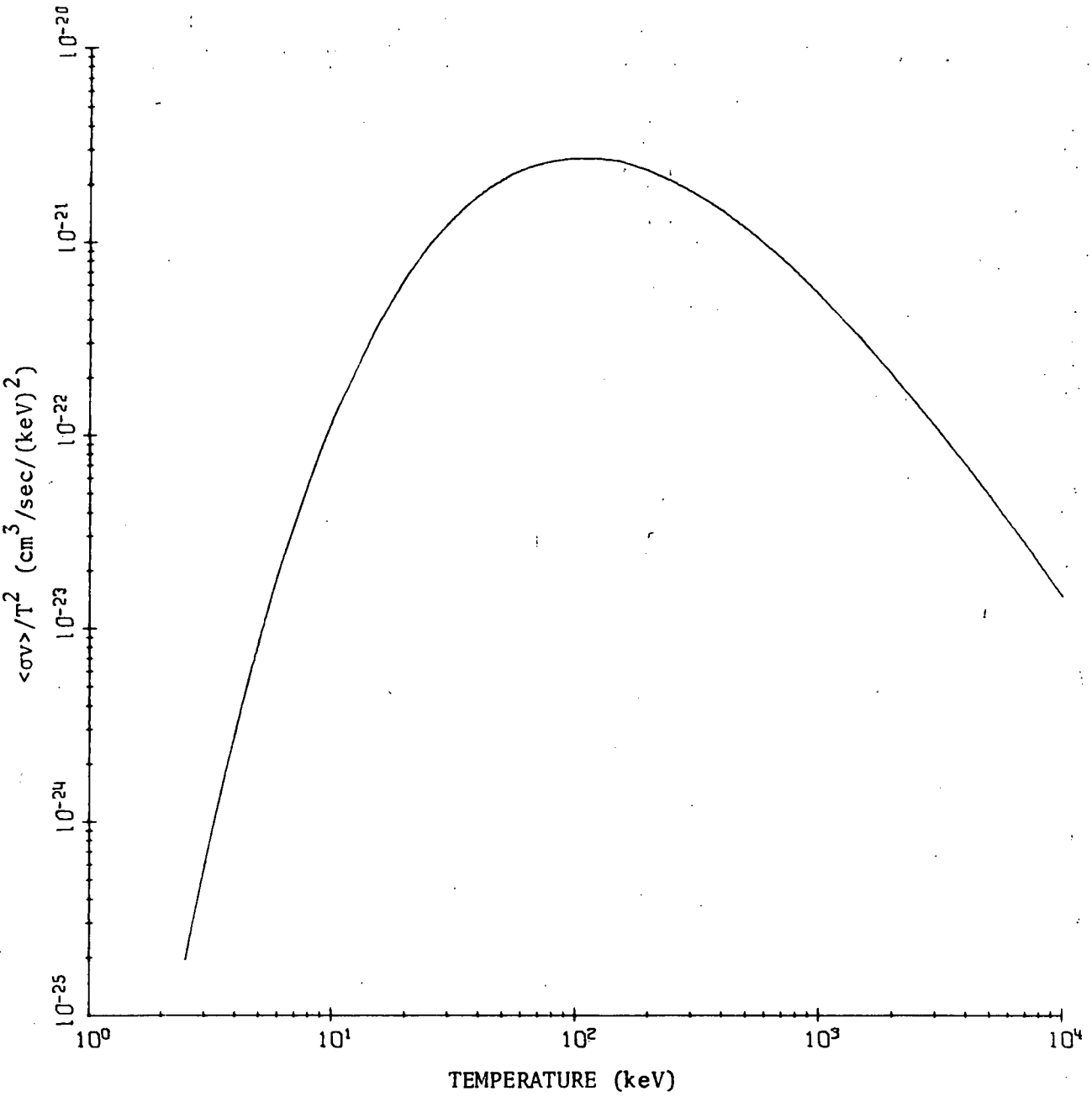
TEMP (keV)	$\langle\sigma v\rangle$ (cm^3/sec)	TEMP (keV)	$\langle\sigma v\rangle$ (cm^3/sec)
1.0000	0.12499D-27	1.5000	0.10428D-25
2.0000	0.16720D-24	2.5000	0.11920D-23
3.0000	0.53002D-23	3.5000	0.17373D-22
4.0000	0.46108D-22	4.5000	0.10495D-21
5.0000	0.21268D-21	5.5000	0.39374D-21
6.0000	0.67818D-21	6.5000	0.11015D-20
7.0000	0.17042D-20	7.5000	0.25313D-20
8.0000	0.36320D-20	8.5000	0.50587D-20
9.0000	0.68669D-20	9.5000	0.91140D-20
10.000	0.11860D-19	15.000	0.80193D-19
20.000	0.26291D-18	25.000	0.60536D-18
30.000	0.11358D-17	35.000	0.18685D-17
40.000	0.28072D-17	45.000	0.39494D-17
50.000	0.52879D-17	55.000	0.68133D-17
60.000	0.85144D-17	65.000	0.10380D-16
70.000	0.12398D-16	75.000	0.14557D-16
80.000	0.16847D-16	85.000	0.19256D-16
90.000	0.21776D-16	95.000	0.24395D-16
100.00	0.27107D-16	150.00	0.57780D-16
200.00	0.91715D-16	250.00	0.12634D-15
300.00	0.16048D-15	350.00	0.19358D-15
400.00	0.22542D-15	450.00	0.25591D-15
500.00	0.28506D-15	550.00	0.31290D-15
600.00	0.33950D-15	650.00	0.36493D-15
700.00	0.38926D-15	750.00	0.41255D-15
800.00	0.43488D-15	850.00	0.45631D-15
900.00	0.47689D-15	950.00	0.49669D-15
1000.0	0.51574D-15	1500.0	0.67404D-15
2000.0	0.79187D-15	2500.0	0.88450D-15
3000.0	0.96010D-15	3500.0	0.10235D-14
4000.0	0.10778D-14	4500.0	0.11251D-14
5000.0	0.11667D-14	5500.0	0.12039D-14
6000.0	0.12373D-14	6500.0	0.12675D-14
7000.0	0.12952D-14	7500.0	0.13205D-14
8000.0	0.13439D-14	8500.0	0.13655D-14
9000.0	0.13857D-14	9500.0	0.14045D-14
10000.	0.14221D-14	15000.	0.15534D-14
20000.	0.16376D-14	25000.	0.16978D-14
30000.	0.17437D-14	35000.	0.17803D-14
40000.	0.18104D-14	45000.	0.18357D-14
50000.	0.18574D-14	55000.	0.18763D-14
60000.	0.18930D-14	65000.	0.19078D-14
70000.	0.19211D-14	75000.	0.19331D-14
80000.	0.19441D-14	85000.	0.19541D-14
90000.	0.19633D-14	95000.	0.19718D-14



Values of <σv> assuming Maxwellian distributions for T-^{3}He fusion reactions

$\langle\sigma v\rangle/T^2$ For $T(^3He,X)Y$ assuming Maxwellian distributions

TEMP (keV)	$\langle\sigma v\rangle/T^2$ ($cm^3/sec/(keV)^2$)	TEMP (keV)	$\langle\sigma v\rangle/T^2$ ($cm^3/sec/(keV)^2$)
1.0000	0.12499D-27	1.5000	0.46348D-26
2.0000	0.41800D-25	2.5000	0.19073D-24
3.0000	0.58891D-24	3.5000	0.14182D-23
4.0000	0.28818D-23	4.5000	0.51826D-23
5.0000	0.85073D-23	5.5000	0.13016D-22
6.0000	0.18838D-22	6.5000	0.26071D-22
7.0000	0.34779D-22	7.5000	0.45001D-22
8.0000	0.56750D-22	8.5000	0.70017D-22
9.0000	0.84776D-22	9.5000	0.10099D-21
10.000	0.11860D-21	15.000	0.35641D-21
20.000	0.65727D-21	25.000	0.96857D-21
30.000	0.12620D-20	35.000	0.15253D-20
40.000	0.17545D-20	45.000	0.19503D-20
50.000	0.21152D-20	55.000	0.22523D-20
60.000	0.23651D-20	65.000	0.24568D-20
70.000	0.25302D-20	75.000	0.25880D-20
80.000	0.26324D-20	85.000	0.26652D-20
90.000	0.26884D-20	95.000	0.27031D-20
100.00	0.27107D-20	150.00	0.25680D-20
200.00	0.22929D-20	250.00	0.20215D-20
300.00	0.17831D-20	350.00	0.15803D-20
400.00	0.14089D-20	450.00	0.12638D-20
500.00	0.11402D-20	550.00	0.10344D-20
600.00	0.94306D-21	650.00	0.86374D-21
700.00	0.79440D-21	750.00	0.73343D-21
800.00	0.67951D-21	850.00	0.63157D-21
900.00	0.58876D-21	950.00	0.55035D-21
1000.0	0.51574D-21	1500.0	0.29957D-21
2000.0	0.19797D-21	2500.0	0.14152D-21
3000.0	0.10668D-21	3500.0	0.83552D-22
4000.0	0.67363D-22	4500.0	0.55558D-22
5000.0	0.46669D-22	5500.0	0.39797D-22
6000.0	0.34368D-22	6500.0	0.30001D-22
7000.0	0.26432D-22	7500.0	0.23476D-22
8000.0	0.20998D-22	8500.0	0.18900D-22
9000.0	0.17107D-22	9500.0	0.15562D-22
10000.	0.14221D-22	15000.	0.69039D-23
20000.	0.40940D-23	25000.	0.27165D-23
30000.	0.19375D-23	35000.	0.14533D-23
40000.	0.11315D-23	45000.	0.90654D-24
50000.	0.74298D-24	55000.	0.62028D-24
60000.	0.52583D-24	65000.	0.45155D-24
70000.	0.39206D-24	75000.	0.34367D-24
80000.	0.30376D-24	85000.	0.27046D-24
90000.	0.24238D-24	95000.	0.21849D-24



Values of $\langle\sigma v\rangle/T^2$ assuming Maxwellian distributions for T-^{3}He reactions.

$\langle\sigma v\rangle_b$ For $T(^3He,X)Y$ assuming beam-Maxwellian distributions

Tritium Temperature = 0

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.11143D-29	15.000	0.11520D-26
20.000	0.70543D-25	25.000	0.11538D-23
30.000	0.89994D-23	35.000	0.44140D-22
40.000	0.15831D-21	45.000	0.45436D-21
50.000	0.11054D-20	55.000	0.23697D-20
60.000	0.45996D-20	65.000	0.82438D-20
70.000	0.13844D-19	75.000	0.22027D-19
80.000	0.33495D-19	85.000	0.49011D-19
90.000	0.69386D-19	95.000	0.95465D-19
100.00	0.12811D-18	110.00	0.21663D-18
120.00	0.34186D-18	130.00	0.51044D-18
140.00	0.72849D-18	150.00	0.10015D-17
160.00	0.13344D-17	170.00	0.17311D-17
180.00	0.21951D-17	190.00	0.27291D-17
200.00	0.33351D-17	250.00	0.74796D-17
300.00	0.13461D-16	350.00	0.21127D-16
400.00	0.30251D-16	450.00	0.40591D-16
500.00	0.51921D-16	550.00	0.64038D-16
600.00	0.76767D-16	650.00	0.89960D-16
700.00	0.10349D-15	750.00	0.11726D-15
800.00	0.13119D-15	850.00	0.14520D-15
900.00	0.15923D-15	950.00	0.17325D-15
1000.0	0.18721D-15	1100.0	0.21483D-15
1200.0	0.24194D-15	1300.0	0.26841D-15
1400.0	0.29417D-15	1500.0	0.31919D-15
1600.0	0.34347D-15	1700.0	0.36699D-15
1800.0	0.38977D-15	1900.0	0.41182D-15
2000.0	0.43318D-15	3000.0	0.61360D-15
4000.0	0.74921D-15	5000.0	0.85550D-15
6000.0	0.94168D-15	7000.0	0.10134D-14
8000.0	0.10744D-14	9000.0	0.11271D-14
10000.	0.11732D-14		

$\langle\sigma v\rangle_b$ For $T(^3He,X)Y$ assuming beam-Maxwellian distributions

Tritium Temperature = 10 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.25027D-20	15.000	0.51652D-20
20.000	0.93568D-20	25.000	0.15530D-19
30.000	0.24181D-19	35.000	0.35847D-19
40.000	0.51098D-19	45.000	0.70532D-19
50.000	0.94770D-19	55.000	0.12445D-18
60.000	0.16020D-18	65.000	0.20270D-18
70.000	0.25257D-18	75.000	0.31048D-18
80.000	0.37706D-18	85.000	0.45292D-18
90.000	0.53869D-18	95.000	0.63495D-18
100.00	0.74227D-18	110.00	0.99227D-18
120.00	0.12928D-17	130.00	0.16474D-17
140.00	0.20594D-17	150.00	0.25314D-17
160.00	0.30659D-17	170.00	0.36645D-17
180.00	0.43289D-17	190.00	0.50600D-17
200.00	0.58586D-17	250.00	0.10867D-16
300.00	0.17511D-16	350.00	0.25641D-16
400.00	0.35060D-16	450.00	0.45565D-16
500.00	0.56959D-16	550.00	0.69066D-16
600.00	0.81733D-16	650.00	0.94828D-16
700.00	0.10824D-15	750.00	0.12187D-15
800.00	0.13565D-15	850.00	0.14950D-15
900.00	0.16339D-15	950.00	0.17725D-15
1000.0	0.19106D-15	1100.0	0.21840D-15
1200.0	0.24524D-15	1300.0	0.27146D-15
1400.0	0.29701D-15	1500.0	0.32183D-15
1600.0	0.34593D-15	1700.0	0.36928D-15
1800.0	0.39192D-15	1900.0	0.41384D-15
2000.0	0.43508D-15	3000.0	0.61474D-15
4000.0	0.75002D-15	5000.0	0.85613D-15
6000.0	0.94221D-15	7000.0	0.10139D-14
8000.0	0.10748D-14	9000.0	0.11275D-14
10000.	0.11736D-14		

$\langle\sigma v\rangle_b$ For $T(^3He,X)Y$ assuming beam-Maxwellian distributions

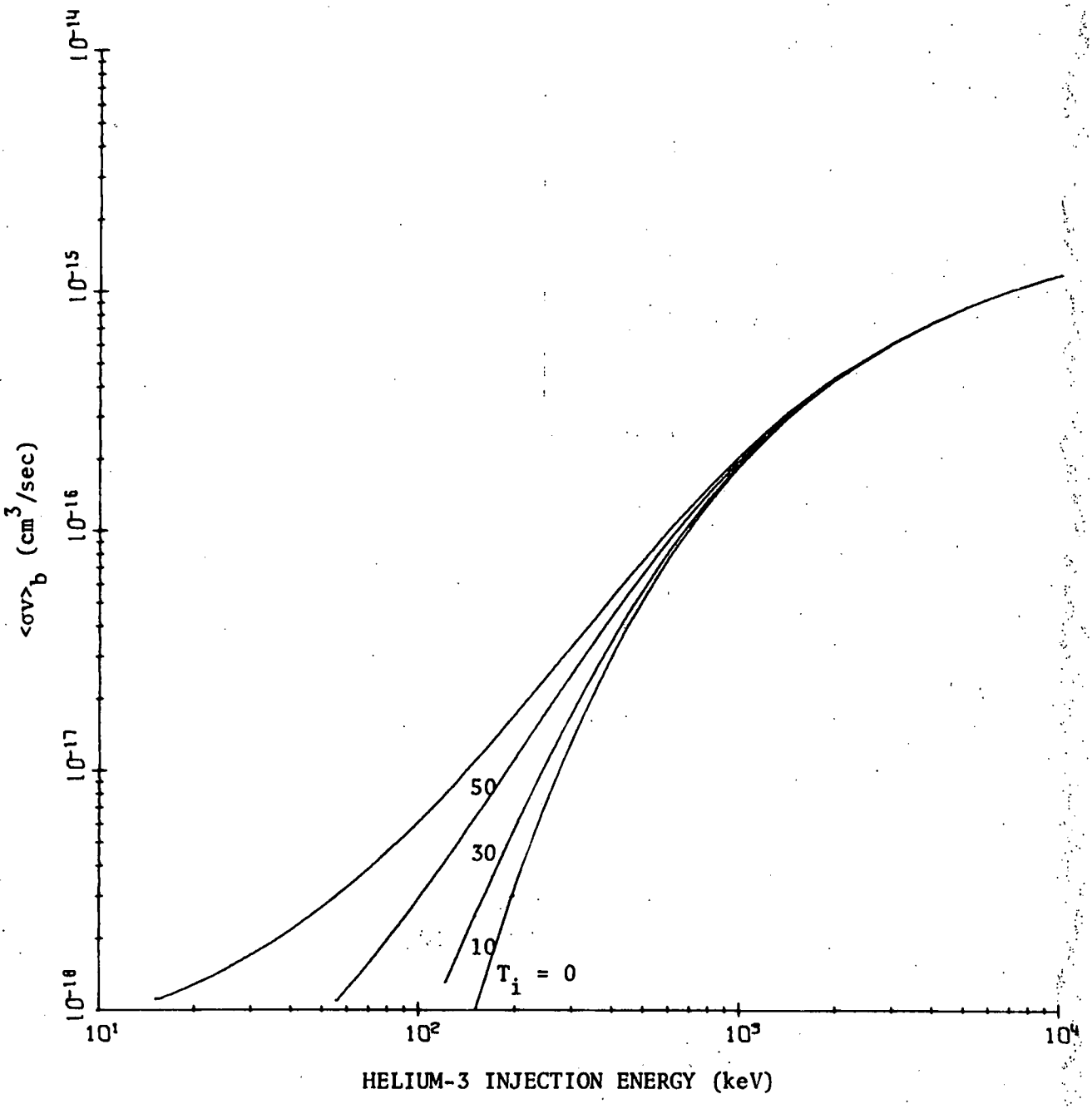
Tritium Temperature = 30 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.17402D-18	15.000	0.23374D-18
20.000	0.30266D-18	25.000	0.38121D-18
30.000	0.46983D-18	35.000	0.56895D-18
40.000	0.67895D-18	45.000	0.80021D-18
50.000	0.93309D-18	55.000	0.10779D-17
60.000	0.12350D-17	65.000	0.14047D-17
70.000	0.15872D-17	75.000	0.17829D-17
80.000	0.19918D-17	85.000	0.22144D-17
90.000	0.24507D-17	95.000	0.27009D-17
100.00	0.29653D-17	110.00	0.35370D-17
120.00	0.41668D-17	130.00	0.48554D-17
140.00	0.56035D-17	150.00	0.64113D-17
160.00	0.72790D-17	170.00	0.82065D-17
180.00	0.91936D-17	190.00	0.10240D-16
200.00	0.11345D-16	250.00	0.17726D-16
300.00	0.25444D-16	350.00	0.34352D-16
400.00	0.44285D-16	450.00	0.55096D-16
500.00	0.66623D-16	550.00	0.78733D-16
600.00	0.91306D-16	650.00	0.10424D-15
700.00	0.11743D-15	750.00	0.13082D-15
800.00	0.14432D-15	850.00	0.15789D-15
900.00	0.17149D-15	950.00	0.18506D-15
1000.0	0.19858D-15	1100.0	0.22537D-15
1200.0	0.25169D-15	1300.0	0.27744D-15
1400.0	0.30254D-15	1500.0	0.32697D-15
1600.0	0.35069D-15	1700.0	0.37372D-15
1800.0	0.39605D-15	1900.0	0.41770D-15
2000.0	0.43868D-15	3000.0	0.61676D-15
4000.0	0.75129D-15	5000.0	0.85700D-15
6000.0	0.94285D-15	7000.0	0.10144D-14
8000.0	0.10752D-14	9000.0	0.11278D-14
10000.	0.11739D-14		

$\langle\sigma v\rangle_b$ For $T(^3He,X)Y$ assuming beam-Maxwellian distributions

Tritium Temperature = 50 keV

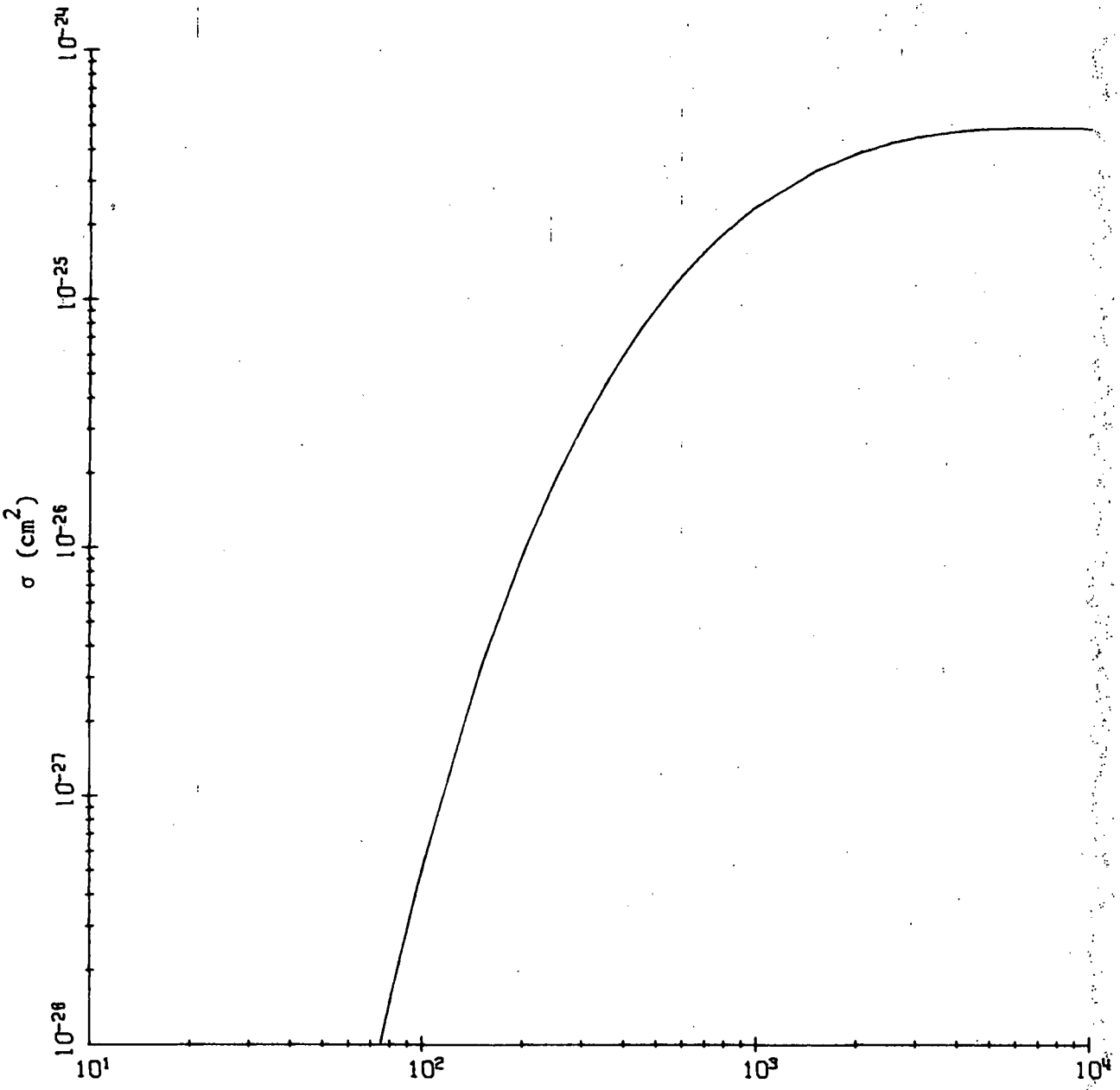
ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.91971D-18	15.000	0.10962D-17
20.000	0.12858D-17	25.000	0.14887D-17
30.000	0.17050D-17	35.000	0.19348D-17
40.000	0.21782D-17	45.000	0.24353D-17
50.000	0.27062D-17	55.000	0.29910D-17
60.000	0.32896D-17	65.000	0.36023D-17
70.000	0.39289D-17	75.000	0.42695D-17
80.000	0.46242D-17	85.000	0.49929D-17
90.000	0.53757D-17	95.000	0.57725D-17
100.00	0.61833D-17	110.00	0.70469D-17
120.00	0.79663D-17	130.00	0.89409D-17
140.00	0.99704D-17	150.00	0.11054D-16
160.00	0.12192D-16	170.00	0.13382D-16
180.00	0.14624D-16	190.00	0.15918D-16
200.00	0.17262D-16	250.00	0.24705D-16
300.00	0.33256D-16	350.00	0.42780D-16
400.00	0.53139D-16	450.00	0.64204D-16
500.00	0.75855D-16	550.00	0.87982D-16
600.00	0.10049D-15	650.00	0.11329D-15
700.00	0.12631D-15	750.00	0.13948D-15
800.00	0.15275D-15	850.00	0.16607D-15
900.00	0.17941D-15	950.00	0.19272D-15
1000.0	0.20558D-15	1100.0	0.23226D-15
1200.0	0.25809D-15	1300.0	0.28337D-15
1400.0	0.30805D-15	1500.0	0.33209D-15
1600.0	0.35546D-15	1700.0	0.37816D-15
1800.0	0.40019D-15	1900.0	0.42157D-15
2000.0	0.44231D-15	3000.0	0.61879D-15
4000.0	0.75258D-15	5000.0	0.85789D-15
6000.0	0.94349D-15	7000.0	0.10149D-14
8000.0	0.10756D-14	9000.0	0.11281D-14
10000.	0.11741D-14		



Values of $\langle\sigma v\rangle_b$ for injection of helium-3 into a tritium background at various temperatures (keV).

Cross Section For $^{3}He(t,X)Y$

ENERGY (keV)	σ (cm^2)	ENERGY (keV)	σ (cm^2)
1.0000	0.38554D-73	1.5000	0.16634D-63
2.0000	0.88025D-58	2.5000	0.69013D-54
3.0000	0.50811D-51	3.5000	0.84879D-49
4.0000	0.52066D-47	4.5000	0.15641D-45
5.0000	0.27661D-44	5.5000	0.32599D-43
6.0000	0.27924D-42	6.5000	0.18514D-41
7.0000	0.99576D-41	7.5000	0.45020D-40
8.0000	0.17592D-39	8.5000	0.60725D-39
9.0000	0.18846D-38	9.5000	0.53342D-38
10.000	0.13932D-37	15.000	0.11761D-34
20.000	0.62369D-33	25.000	0.91243D-32
30.000	0.64967D-31	35.000	0.29501D-30
40.000	0.98975D-30	45.000	0.26782D-29
50.000	0.61813D-29	55.000	0.12635D-28
60.000	0.23480D-28	65.000	0.40431D-28
70.000	0.65427D-28	75.000	0.10057D-27
80.000	0.14808D-27	85.000	0.21020D-27
90.000	0.28920D-27	95.000	0.38729D-27
100.00	0.50658D-27	150.00	0.32335D-26
200.00	0.93249D-26	250.00	0.18705D-25
300.00	0.30731D-25	350.00	0.44654D-25
400.00	0.59809D-25	450.00	0.75664D-25
500.00	0.91817D-25	550.00	0.10797D-24
600.00	0.12393D-24	650.00	0.13953D-24
700.00	0.15468D-24	750.00	0.16932D-24
800.00	0.18341D-24	850.00	0.19693D-24
900.00	0.20988D-24	950.00	0.22227D-24
1000.0	0.23409D-24	1500.0	0.32589D-24
2000.0	0.38302D-24	2500.0	0.41938D-24
3000.0	0.44299D-24	3500.0	0.45842D-24
4000.0	0.46843D-24	4500.0	0.47472D-24
5000.0	0.47841D-24	5500.0	0.48024D-24
6000.0	0.48072D-24	6500.0	0.48021D-24
7000.0	0.47897D-24	7500.0	0.47719D-24
8000.0	0.47500D-24	8500.0	0.47251D-24
9000.0	0.46979D-24	9500.0	0.46692D-24
10000.	0.46394D-24	15000.	0.43293D-24
20000.	0.40523D-24	25000.	0.38187D-24
30000.	0.36213D-24	35000.	0.34525D-24
40000.	0.33063D-24	45000.	0.31781D-24
50000.	0.30645D-24	55000.	0.29630D-24
60000.	0.28714D-24	65000.	0.27884D-24
70000.	0.27125D-24	75000.	0.26429D-24
80000.	0.25786D-24	85000.	0.25191D-24
90000.	0.24638D-24	95000.	0.24121D-24



Cross Section For ^{3}He(t,X)Y

$\langle\sigma v\rangle_b$ For $^3He(t,X)Y$ assuming beam-Maxwellian distributions

Helium-3 Temperature = 0

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)		$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.11142D-29	15.000	0.11519D-26
20.000	0.70537D-25	25.000	0.11537D-23
30.000	0.89988D-23	35.000	0.44137D-22
40.000	0.15830D-21	45.000	0.45434D-21
50.000	0.11053D-20	55.000	0.23696D-20
60.000	0.45994D-20	65.000	0.82433D-20
70.000	0.13943D-19	75.000	0.22026D-19
80.000	0.33494D-19	85.000	0.49009D-19
90.000	0.69383D-19	95.000	0.95461D-19
100.00	0.12811D-18	110.00	0.21662D-18
120.00	0.34185D-18	130.00	0.51042D-18
140.00	0.72847D-18	150.00	0.10015D-17
160.00	0.13343D-17	170.00	0.17311D-17
180.00	0.21950D-17	190.00	0.27290D-17
200.00	0.33350D-17	250.00	0.74794D-17
300.00	0.13461D-16	350.00	0.21126D-16
400.00	0.30250D-16	450.00	0.40591D-16
500.00	0.51921D-16	550.00	0.64037D-16
600.00	0.76766D-16	650.00	0.89959D-16
700.00	0.10349D-15	750.00	0.11726D-15
800.00	0.13119D-15	850.00	0.14520D-15
900.00	0.15923D-15	950.00	0.17325D-15
1000.0	0.18720D-15	1100.0	0.21483D-15
1200.0	0.24194D-15	1300.0	0.26840D-15
1400.0	0.29417D-15	1500.0	0.31919D-15
1600.0	0.34346D-15	1700.0	0.36699D-15
1800.0	0.38977D-15	1900.0	0.41182D-15
2000.0	0.43318D-15	3000.0	0.61360D-15
4000.0	0.74921D-15	5000.0	0.85550D-15
6000.0	0.94168D-15	7000.0	0.10134D-14
8000.0	0.10744D-14	9000.0	0.11271D-14
10000.	0.11732D-14		

$\langle\sigma v\rangle_b$ For $^3He(t,X)Y$ assuming beam-Maxwellian distributions

Helium-3 Temperature = 10 keV

ENERGY (keV)	$\langle\sigma v\rangle$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.25027D-20	15.000	0.51652D-20
20.000	0.93569D-20	25.000	0.15530D-19
30.000	0.24181D-19	35.000	0.35847D-19
40.000	0.51098D-19	45.000	0.70532D-19
50.000	0.94769D-19	55.000	0.12444D-18
60.000	0.16020D-18	65.000	0.20269D-18
70.000	0.25257D-18	75.000	0.31048D-18
80.000	0.37705D-18	85.000	0.45292D-18
90.000	0.53868D-18	95.000	0.63494D-18
100.00	0.74226D-18	110.00	0.99226D-18
120.00	0.12927D-17	130.00	0.16474D-17
140.00	0.20593D-17	150.00	0.25314D-17
160.00	0.30658D-17	170.00	0.36645D-17
180.00	0.43288D-17	190.00	0.50600D-17
200.00	0.58585D-17	250.00	0.10866D-16
300.00	0.17510D-16	350.00	0.25640D-16
400.00	0.35060D-16	450.00	0.45564D-16
500.00	0.56958D-16	550.00	0.69065D-16
600.00	0.81732D-16	650.00	0.94826D-16
700.00	0.10824D-15	750.00	0.12187D-15
800.00	0.13565D-15	850.00	0.14950D-15
900.00	0.16338D-15	950.00	0.17725D-15
1000.0	0.19106D-15	1100.0	0.21840D-15
1200.0	0.24524D-15	1300.0	0.27146D-15
1400.0	0.29701D-15	1500.0	0.32183D-15
1600.0	0.34592D-15	1700.0	0.36928D-15
1800.0	0.39191D-15	1900.0	0.41384D-15
2000.0	0.43507D-15	3000.0	0.61474D-15
4000.0	0.75001D-15	5000.0	0.85613D-15
6000.0	0.94221D-15	7000.0	0.10139D-14
8000.0	0.10748D-14	9000.0	0.11275D-14
10000.	0.11736D-14		

$\langle\sigma v\rangle_b$ For $^3He(t,X)Y$ assuming beam-Maxwellian distributions

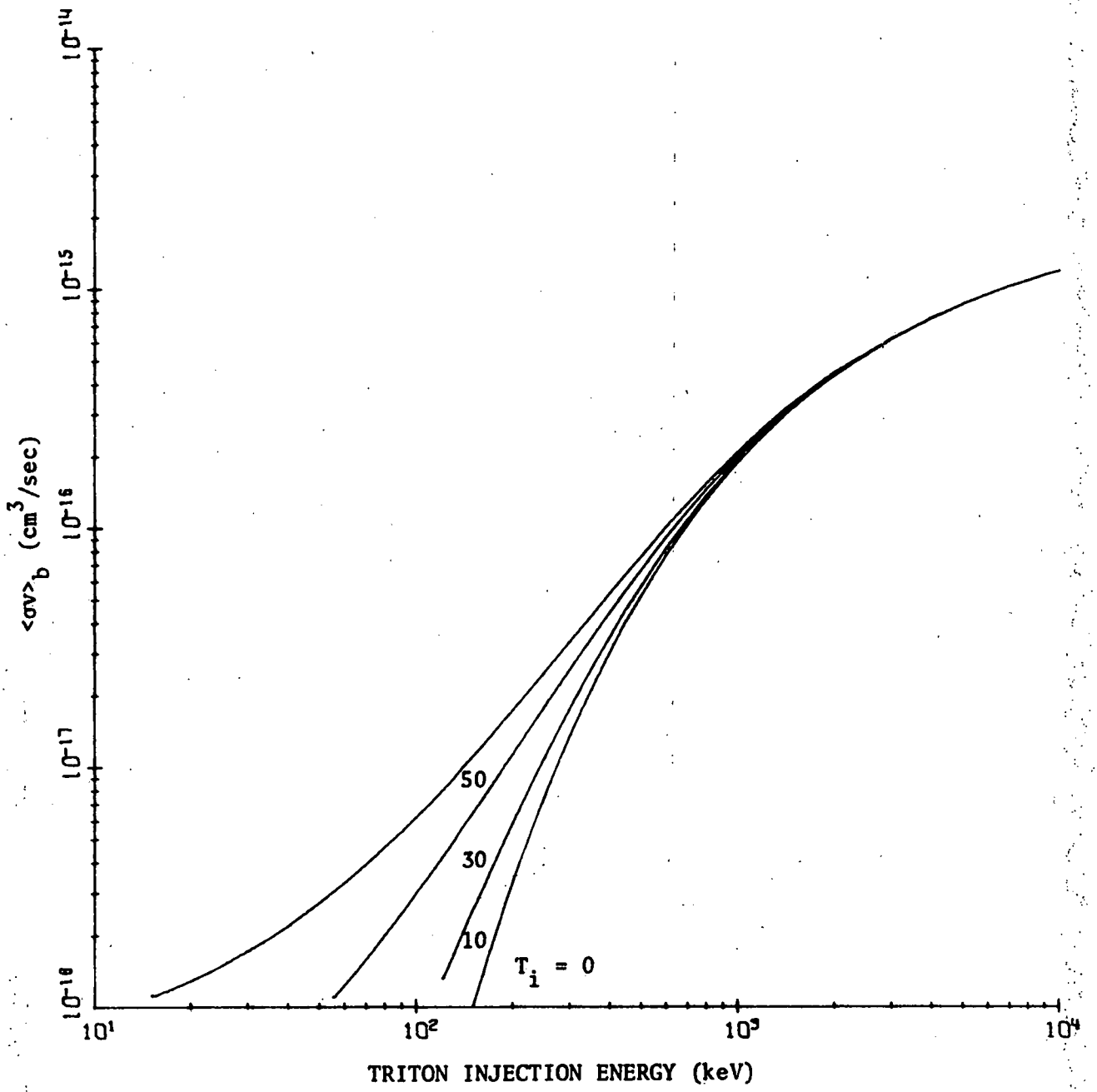
Helium-3 Temperature = 30 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.17402D-18	15.000	0.23375D-18
20.000	0.30266D-18	25.000	0.38121D-18
30.000	0.46983D-18	35.000	0.56895D-18
40.000	0.67895D-18	45.000	0.80021D-18
50.000	0.93310D-18	55.000	0.10779D-17
60.000	0.12350D-17	65.000	0.14047D-17
70.000	0.15872D-17	75.000	0.17829D-17
80.000	0.19918D-17	85.000	0.22144D-17
90.000	0.24507D-17	95.000	0.27009D-17
100.00	0.29653D-17	110.00	0.35370D-17
120.00	0.41668D-17	130.00	0.48554D-17
140.00	0.56035D-17	150.00	0.64113D-17
160.00	0.72789D-17	170.00	0.82064D-17
180.00	0.91935D-17	190.00	0.10240D-16
200.00	0.11345D-16	250.00	0.17726D-16
300.00	0.25444D-16	350.00	0.34352D-16
400.00	0.44285D-16	450.00	0.55096D-16
500.00	0.66622D-16	550.00	0.78732D-16
600.00	0.91305D-16	650.00	0.10423D-15
700.00	0.11743D-15	750.00	0.13081D-15
800.00	0.14432D-15	850.00	0.15789D-15
900.00	0.17149D-15	950.00	0.18506D-15
1000.0	0.19858D-15	1100.0	0.22537D-15
1200.0	0.25169D-15	1300.0	0.27744D-15
1400.0	0.30254D-15	1500.0	0.32696D-15
1600.0	0.35069D-15	1700.0	0.37372D-15
1800.0	0.39605D-15	1900.0	0.41770D-15
2000.0	0.43868D-15	3000.0	0.61676D-15
4000.0	0.75129D-15	5000.0	0.85700D-15
6000.0	0.94285D-15	7000.0	0.10144D-14
8000.0	0.10752D-14	9000.0	0.11278D-14
10000.	0.11739D-14		

$\langle\sigma v\rangle_b$ For $^3He(t,X)Y$ assuming beam-Maxwellian distributions

Helium-3 Temperature = 50 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.91973D-18	15.000	0.10962D-17
20.000	0.12856D-17	25.000	0.14887D-17
30.000	0.17050D-17	35.000	0.19348D-17
40.000	0.21782D-17	45.000	0.24353D-17
50.000	0.27062D-17	55.000	0.29910D-17
60.000	0.32896D-17	65.000	0.36023D-17
70.000	0.39289D-17	75.000	0.42695D-17
80.000	0.46242D-17	85.000	0.49929D-17
90.000	0.53757D-17	95.000	0.57725D-17
100.00	0.61833D-17	110.00	0.70469D-17
120.00	0.79662D-17	130.00	0.89409D-17
140.00	0.99704D-17	150.00	0.11054D-16
160.00	0.12192D-16	170.00	0.13382D-16
180.00	0.14624D-16	190.00	0.15918D-16
200.00	0.17262D-16	250.00	0.24705D-16
300.00	0.33256D-16	350.00	0.42780D-16
400.00	0.53139D-16	450.00	0.64204D-16
500.00	0.75854D-16	550.00	0.87981D-16
600.00	0.10049D-15	650.00	0.11329D-15
700.00	0.12630D-15	750.00	0.13948D-15
800.00	0.15275D-15	850.00	0.16607D-15
900.00	0.17941D-15	950.00	0.19272D-15
1000.0	0.20598D-15	1100.0	0.23226D-15
1200.0	0.25809D-15	1300.0	0.28337D-15
1400.0	0.30805D-15	1500.0	0.33209D-15
1600.0	0.35546D-15	1700.0	0.37816D-15
1800.0	0.40019D-15	1900.0	0.42157D-15
2000.0	0.44231D-15	3000.0	0.61879D-15
4000.0	0.75257D-15	5000.0	0.85788D-15
6000.0	0.94349D-15	7000.0	0.10149D-14
8000.0	0.10756D-14	9000.0	0.11281D-14
10000.	0.11741D-14		



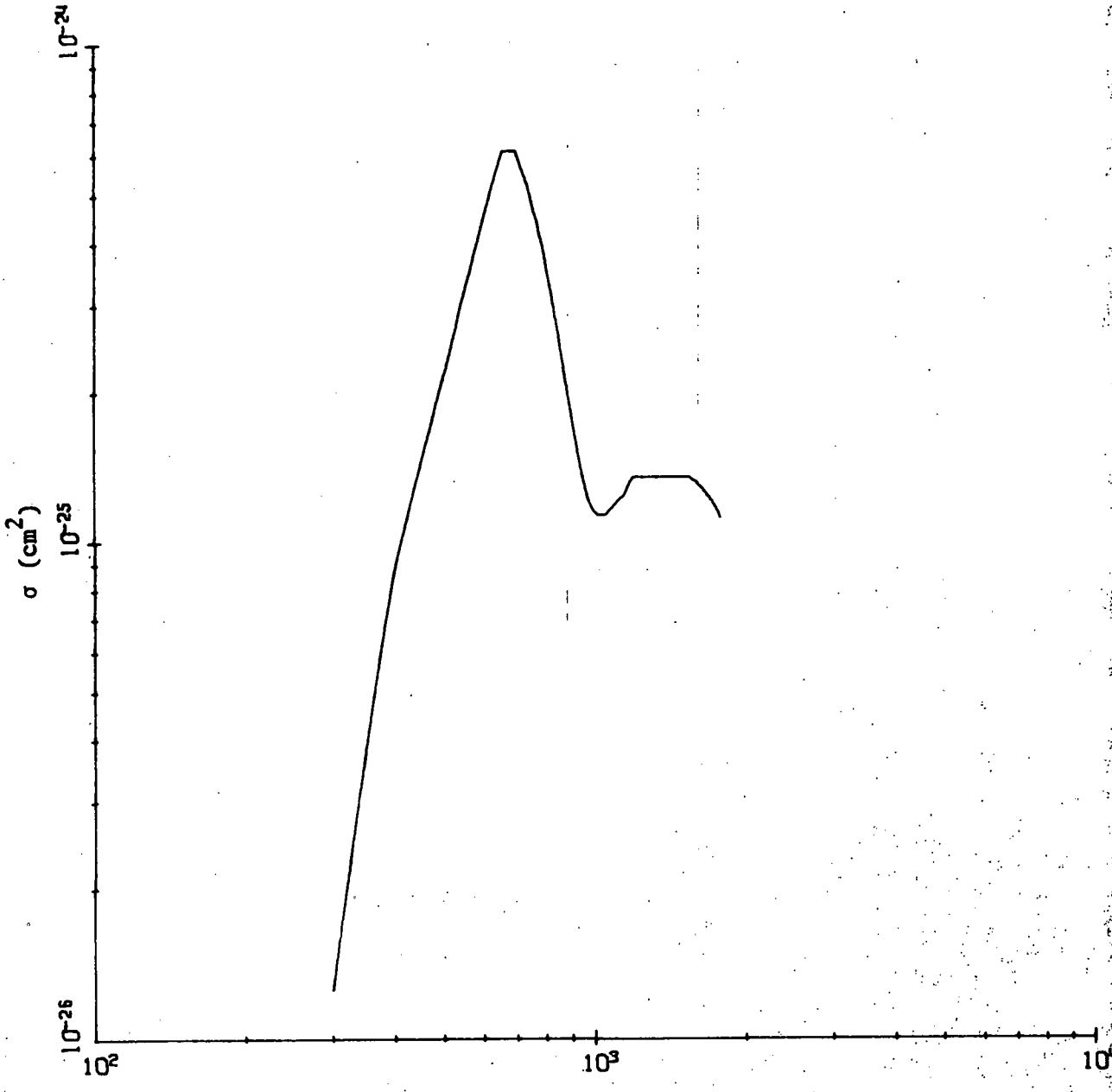
Values of $\langle\sigma v\rangle_b$ for injection of tritium into a helium-3 background at various temperatures (keV)

Section 7

Proton-Boron-11 Reactions

Cross Section For $^{11}B(p,2^4He)^4He$

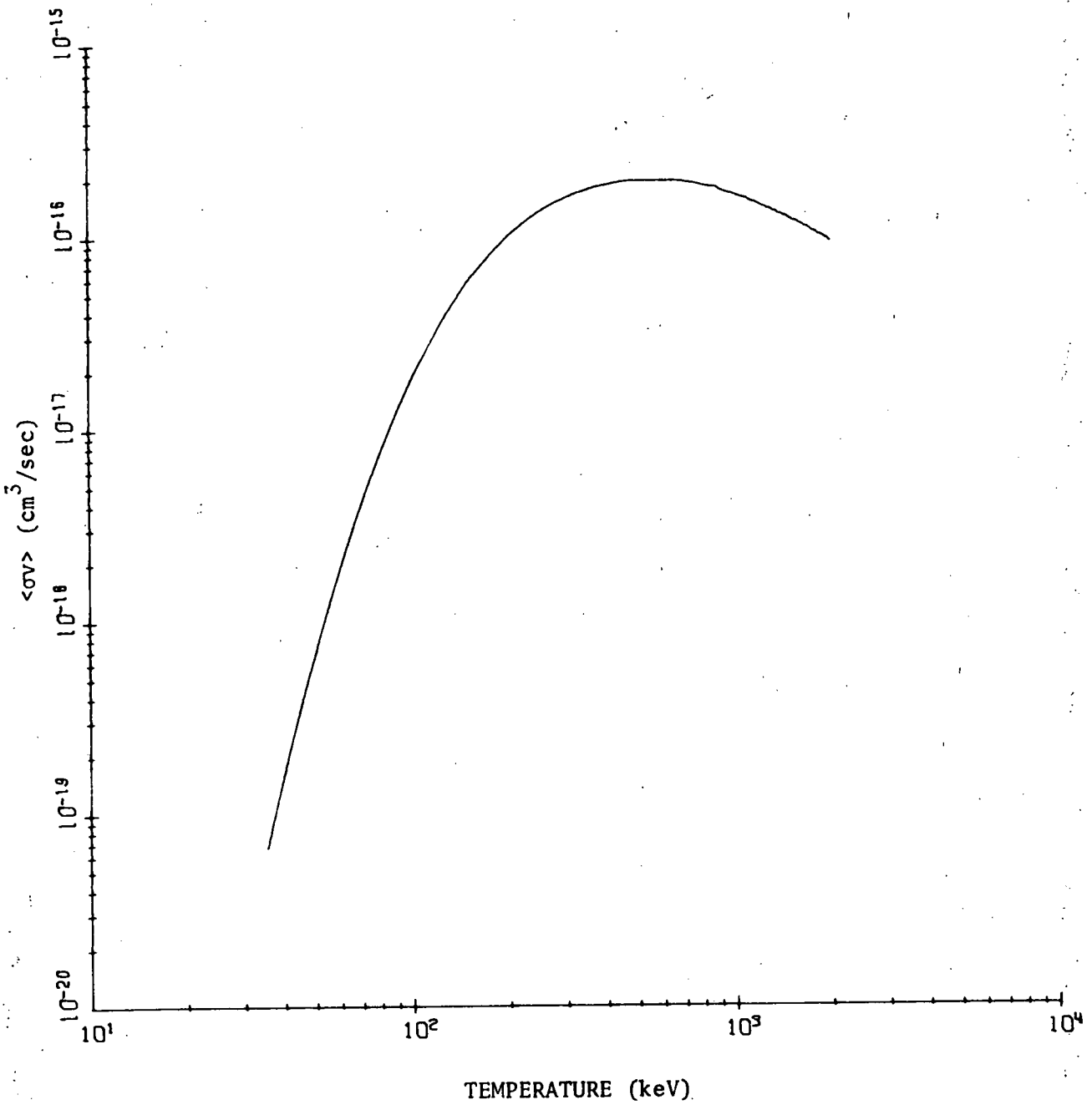
ENERGY (keV)	$\sigma(cm^2)$	ENERGY (keV)	$\sigma(cm^2)$
35.000	0.11818D-38	40.000	0.24189D-37
45.000	0.29275D-36	50.000	0.23994D-35
55.000	0.14590D-34	60.000	0.70176D-34
65.000	0.27963D-33	70.000	0.95549D-33
75.000	0.28742D-32	80.000	0.77681D-32
85.000	0.19170D-31	90.000	0.43757D-31
95.000	0.93355D-31	100.00	0.18778D-30
125.00	0.31675D-29	150.00	0.25052D-28
175.00	0.12344D-27	200.00	0.44233D-27
225.00	0.12640D-26	250.00	0.30551D-26
275.00	0.64975D-26	300.00	0.12500D-25
325.00	0.22192D-25	350.00	0.36903D-25
375.00	0.58129D-25	400.00	0.87061D-25
425.00	0.11275D-24	450.00	0.14127D-24
475.00	0.17399D-24	500.00	0.21247D-24
525.00	0.25796D-24	550.00	0.31106D-24
575.00	0.37129D-24	600.00	0.43664D-24
625.00	0.59548D-24	650.00	0.61000D-24
675.00	0.61500D-24	700.00	0.61000D-24
725.00	0.54787D-24	750.00	0.49096D-24
775.00	0.42994D-24	800.00	0.36920D-24
825.00	0.31204D-24	850.00	0.26079D-24
875.00	0.21693D-24	900.00	0.18120D-24
925.00	0.15369D-24	950.00	0.13398D-24
975.00	0.12125D-24	1000.0	0.11436D-24
1025.0	0.11200D-24	1050.0	0.11280D-24
1075.0	0.11539D-24	1100.0	0.11860D-24
1125.0	0.12149D-24	1150.0	0.12351D-24
1175.0	0.13000D-24	1200.0	0.13500D-24
1225.0	0.13500D-24	1250.0	0.13500D-24
1275.0	0.13500D-24	1300.0	0.13500D-24
1325.0	0.13500D-24	1350.0	0.13500D-24
1375.0	0.13500D-24	1400.0	0.13500D-24
1425.0	0.13500D-24	1450.0	0.13500D-24
1475.0	0.13500D-24	1500.0	0.13500D-24
1525.0	0.13500D-24	1550.0	0.13444D-24
1575.0	0.13308D-24	1600.0	0.13135D-24
1625.0	0.12940D-24	1650.0	0.12729D-24
1675.0	0.12505D-24	1700.0	0.12264D-24
1725.0	0.12003D-24	1750.0	0.11717D-24
1775.0	0.11400D-24	1800.0	0.11050D-24
1825.0	0.10669D-24	1850.0	0.10263D-24
1875.0	0.98459D-25	1900.0	0.94387D-25
1925.0	0.90729D-25	1950.0	0.87912D-25
1975.0	0.86490D-25		



Cross section for $^{11}B(p,2^4He)^4He$

<σv> For $^{11}B(p,2^4He)^4He$ assuming Maxwellian distributions

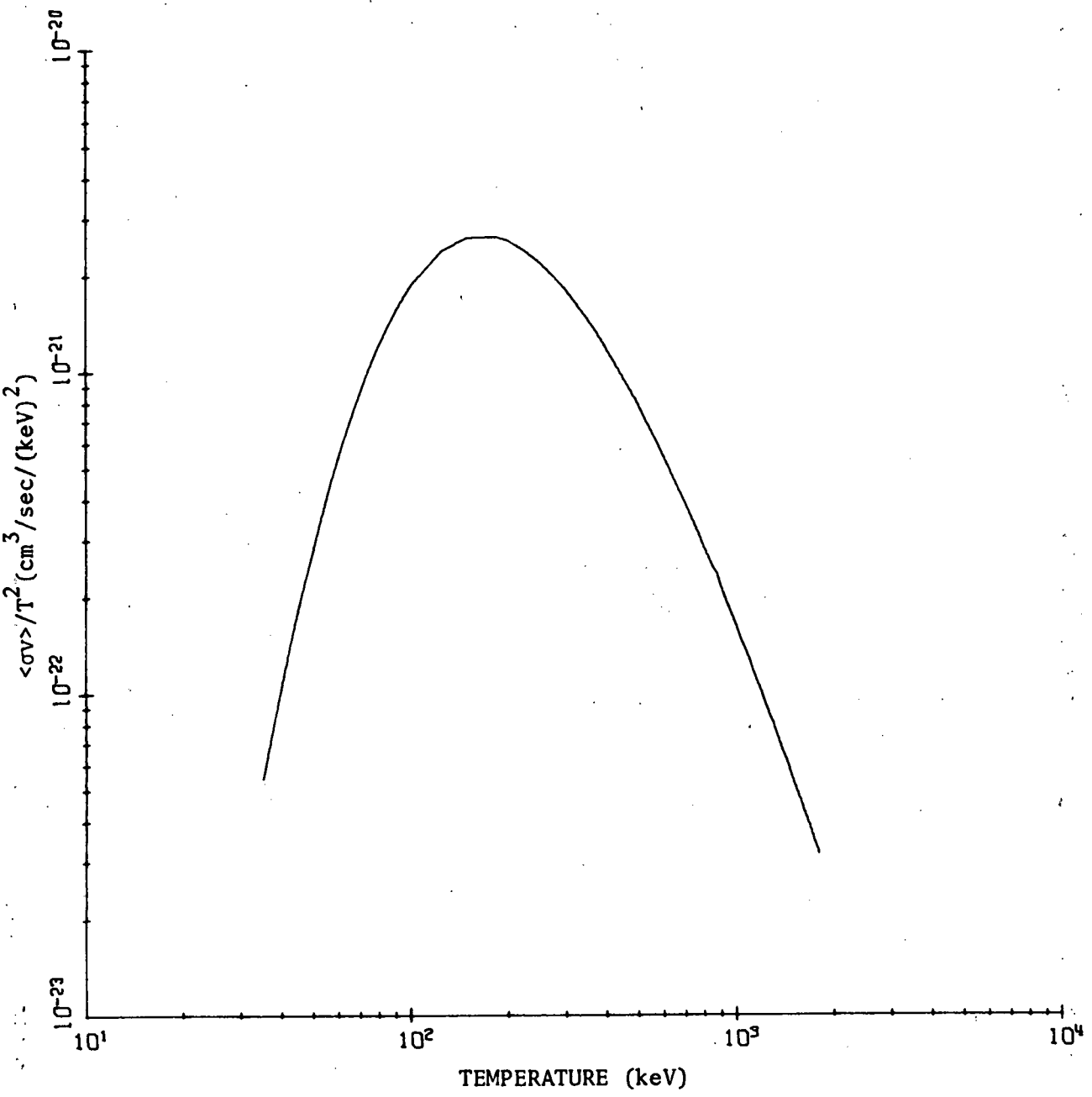
TEMP (keV)	<σv> (cm^3/sec)	TEMP (keV)	<σv> (cm^3/sec)
35.000	0.65854D-19	40.000	0.16756D-18
45.000	0.36299D-18	50.000	0.69305D-18
55.000	0.12033D-17	60.000	0.19428D-17
65.000	0.29376D-17	70.000	0.42217D-17
75.000	0.58449D-17	80.000	0.77182D-17
85.000	0.99819D-17	90.000	0.12571D-16
95.000	0.15321D-16	100.00	0.18511D-16
125.00	0.37355D-16	150.00	0.58917D-16
175.00	0.80581D-16	200.00	0.10082D-15
225.00	0.11871D-15	250.00	0.13468D-15
275.00	0.14771D-15	300.00	0.15878D-15
325.00	0.16775D-15	350.00	0.17514D-15
375.00	0.18075D-15	400.00	0.18524D-15
425.00	0.18914D-15	450.00	0.19141D-15
475.00	0.19318D-15	500.00	0.19369D-15
525.00	0.19405D-15	550.00	0.19421D-15
575.00	0.19381D-15	600.00	0.19319D-15
625.00	0.19203D-15	650.00	0.19015D-15
675.00	0.18811D-15	700.00	0.18689D-15
725.00	0.18491D-15	750.00	0.18312D-15
775.00	0.18048D-15	800.00	0.17808D-15
825.00	0.17569D-15	850.00	0.17389D-15
875.00	0.17625D-15	900.00	0.16903D-15
925.00	0.16640D-15	950.00	0.16385D-15
975.00	0.16160D-15	1000.0	0.16006D-15
1025.0	0.15763D-15	1050.0	0.15522D-15
1075.0	0.15228D-15	1100.0	0.15036D-15
1125.0	0.14864D-15	1150.0	0.14572D-15
1175.0	0.14372D-15	1200.0	0.14177D-15
1225.0	0.13886D-15	1250.0	0.13708D-15
1275.0	0.13523D-15	1300.0	0.13393D-15
1325.0	0.13112D-15	1350.0	0.12977D-15
1375.0	0.12751D-15	1400.0	0.12574D-15
1425.0	0.12401D-15	1450.0	0.12226D-15
1475.0	0.12067D-15	1500.0	0.11909D-15
1525.0	0.11701D-15	1550.0	0.11576D-15
1575.0	0.11417D-15	1600.0	0.11258D-15
1625.0	0.11092D-15	1650.0	0.10932D-15
1675.0	0.10808D-15	1700.0	0.10659D-15
1725.0	0.10493D-15	1750.0	0.10330D-15
1775.0	0.10213D-15	1800.0	0.10050D-15
1825.0	0.99476D-16	1850.0	0.98375D-16
1875.0	0.97160D-16	1900.0	0.95917D-16
1925.0	0.94523D-16	1950.0	0.93111D-16
1975.0	0.91497D-16	2000.0	0.90276D-16



Values of <σv> assuming Maxwellian distributions for p-^{11}B fusion reactions

$\langle\sigma v\rangle/T^2$ For $^{11}B(p,2^4He)^4He$ assuming Maxwellian distributions.

TEMP (keV)	$\langle\sigma v\rangle/T^2$ ($cm^3/sec/(keV)^2$)	TEMP (keV)	$\langle\sigma v\rangle/T^2$ ($cm^3/sec/(keV)^2$)
35.000	0.53759D-22	40.000	0.10472D-21
45.000	0.17925D-21	50.000	0.27722D-21
55.000	0.39779D-21	60.000	0.53966D-21
65.000	0.69528D-21	70.000	0.86156D-21
75.000	0.10391D-20	80.000	0.12060D-20
85.000	0.13816D-20	90.000	0.15520D-20
95.000	0.16976D-20	100.00	0.18511D-20
125.00	0.23907D-20	150.00	0.26185D-20
175.00	0.26312D-20	200.00	0.25205D-20
225.00	0.23448D-20	250.00	0.21548D-20
275.00	0.19532D-20	300.00	0.17642D-20
325.00	0.15882D-20	350.00	0.14297D-20
375.00	0.12854D-20	400.00	0.11578D-20
425.00	0.10472D-20	450.00	0.94524D-21
475.00	0.85621D-21	500.00	0.77476D-21
525.00	0.70404D-21	550.00	0.64201D-21
575.00	0.58619D-21	600.00	0.53665D-21
625.00	0.49161D-21	650.00	0.45006D-21
675.00	0.41286D-21	700.00	0.38140D-21
725.00	0.35179D-21	750.00	0.32555D-21
775.00	0.30049D-21	800.00	0.27825D-21
825.00	0.25813D-21	850.00	0.24068D-21
875.00	0.23021D-21	900.00	0.20867D-21
925.00	0.19448D-21	950.00	0.18156D-21
975.00	0.16999D-21	1000.0	0.16006D-21
1025.0	0.15004D-21	1050.0	0.14079D-21
1075.0	0.13177D-21	1100.0	0.12426D-21
1125.0	0.11745D-21	1150.0	0.11018D-21
1175.0	0.10410D-21	1200.0	0.98450D-22
1225.0	0.92533D-22	1250.0	0.87728D-22
1275.0	0.83186D-22	1300.0	0.79249D-22
1325.0	0.74688D-22	1350.0	0.71202D-22
1375.0	0.67442D-22	1400.0	0.64155D-22
1425.0	0.61069D-22	1450.0	0.58152D-22
1475.0	0.55465D-22	1500.0	0.52929D-22
1525.0	0.50315D-22	1550.0	0.48181D-22
1575.0	0.46024D-22	1600.0	0.43975D-22
1625.0	0.42006D-22	1650.0	0.40156D-22
1675.0	0.38523D-22	1700.0	0.36881D-22
1725.0	0.35264D-22	1750.0	0.33731D-22
1775.0	0.32415D-22	1800.0	0.31018D-22
1825.0	0.29867D-22	1850.0	0.28744D-22
1875.0	0.27637D-22	1900.0	0.26570D-22
1925.0	0.25508D-22	1950.0	0.24487D-22
1975.0	0.23457D-22	2000.0	0.22569D-22



Values of $\langle\sigma v\rangle/T^2$ assuming Maxwellian distributions for p-^{11}B reactions

$\langle\sigma v\rangle_b$ For $^{11}B(p,2^4He)^4He$ assuming beam-Maxwellian distributions.

Boron-11 Temperature = 0

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.19854D-48	20.000	0.57913D-37
30.000	0.66154D-32	40.000	0.66929D-29
50.000	0.74223D-27	60.000	0.23781D-25
70.000	0.34973D-24	80.000	0.30396D-23
90.000	0.18160D-22	100.00	0.82150D-22
150.00	0.13423D-19	200.00	0.27367D-18
250.00	0.21133D-17	300.00	0.94717D-17
350.00	0.30203D-16	400.00	0.76559D-16
450.00	0.13110D-15	500.00	0.20784D-15
550.00	0.31915D-15	600.00	0.46791D-15
625.00	0.55038D-15	650.00	0.68037D-15
675.00	0.69901D-15	700.00	0.70605D-15
725.00	0.70144D-15	750.00	0.58821D-15
775.00	0.52362D-15	800.00	0.45684D-15
825.00	0.39209D-15	850.00	0.33262D-15
875.00	0.28073D-15	900.00	0.23781D-15
925.00	0.20449D-15	950.00	0.18067D-15
975.00	0.16563D-15	1000.0	0.15821D-15
1025.0	0.15687D-15	1050.0	0.15990D-15
1075.0	0.16552D-15	1100.0	0.17208D-15
1125.0	0.17827D-15	1150.0	0.18324D-15
1175.0	0.18685D-15	1200.0	0.19701D-15
1225.0	0.20671D-15	1250.0	0.20881D-15
1275.0	0.21089D-15	1300.0	0.21294D-15
1325.0	0.21498D-15	1350.0	0.21700D-15
1375.0	0.21900D-15	1400.0	0.22098D-15
1425.0	0.22295D-15	1450.0	0.22489D-15
1475.0	0.22682D-15	1500.0	0.22874D-15
1525.0	0.23064D-15	1550.0	0.23252D-15
1575.0	0.23105D-15	1600.0	0.22986D-15
1625.0	0.22820D-15	1650.0	0.22621D-15
1675.0	0.22389D-15	1700.0	0.22122D-15
1725.0	0.21810D-15	1750.0	0.21443D-15
1775.0	0.21011D-15	1800.0	0.20510D-15

$\langle\sigma v\rangle_b$ For $^{11}B(p,2^4He)^4He$ assuming beam-Maxwellian distributions.

Boron 11 Temperature = 50 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.62092D-26	20.000	0.17653D-24
30.000	0.18645D-23	40.000	0.11751D-22
50.000	0.53370D-22	60.000	0.19261D-21
70.000	0.58562D-21	80.000	0.15582D-20
90.000	0.37256D-20	100.00	0.81597D-20
150.00	0.16572D-18	200.00	0.13212D-17
250.00	0.61385D-17	300.00	0.19770D-16
350.00	0.47953D-16	400.00	0.93921D-16
450.00	0.16020D-15	500.00	0.25106D-15
550.00	0.36441D-15	600.00	0.48003D-15
625.00	0.52703D-15	650.00	0.56038D-15
675.00	0.57704D-15	700.00	0.57604D-15
725.00	0.55906D-15	750.00	0.52886D-15
775.00	0.48962D-15	800.00	0.44546D-15
825.00	0.39943D-15	850.00	0.35510D-15
875.00	0.31432D-15	900.00	0.27865D-15
925.00	0.24888D-15	950.00	0.22511D-15
975.00	0.20715D-15	1000.0	0.19448D-15
1025.0	0.18641D-15	1050.0	0.18216D-15
1075.0	0.18087D-15	1100.0	0.18187D-15
1125.0	0.18431D-15	1150.0	0.18806D-15
1175.0	0.19184D-15	1200.0	0.19607D-15
1225.0	0.20013D-15	1250.0	0.20395D-15
1275.0	0.20748D-15	1300.0	0.21065D-15
1325.0	0.21347D-15	1350.0	0.21597D-15
1375.0	0.21818D-15	1400.0	0.22010D-15
1425.0	0.22174D-15	1450.0	0.22309D-15
1475.0	0.22412D-15	1500.0	0.22480D-15
1525.0	0.22509D-15	1550.0	0.22496D-15
1575.0	0.22435D-15	1600.0	0.22325D-15
1625.0	0.22160D-15	1650.0	0.21939D-15
1675.0	0.21647D-15	1700.0	0.21284D-15
1725.0	0.20836D-15	1750.0	0.20319D-15
1775.0	0.19675D-15	1800.0	0.18932D-15

$\langle\sigma v\rangle_b$ For $^{11}B(p,2^4He)^4He$ assuming beam-Maxwellian distributions.

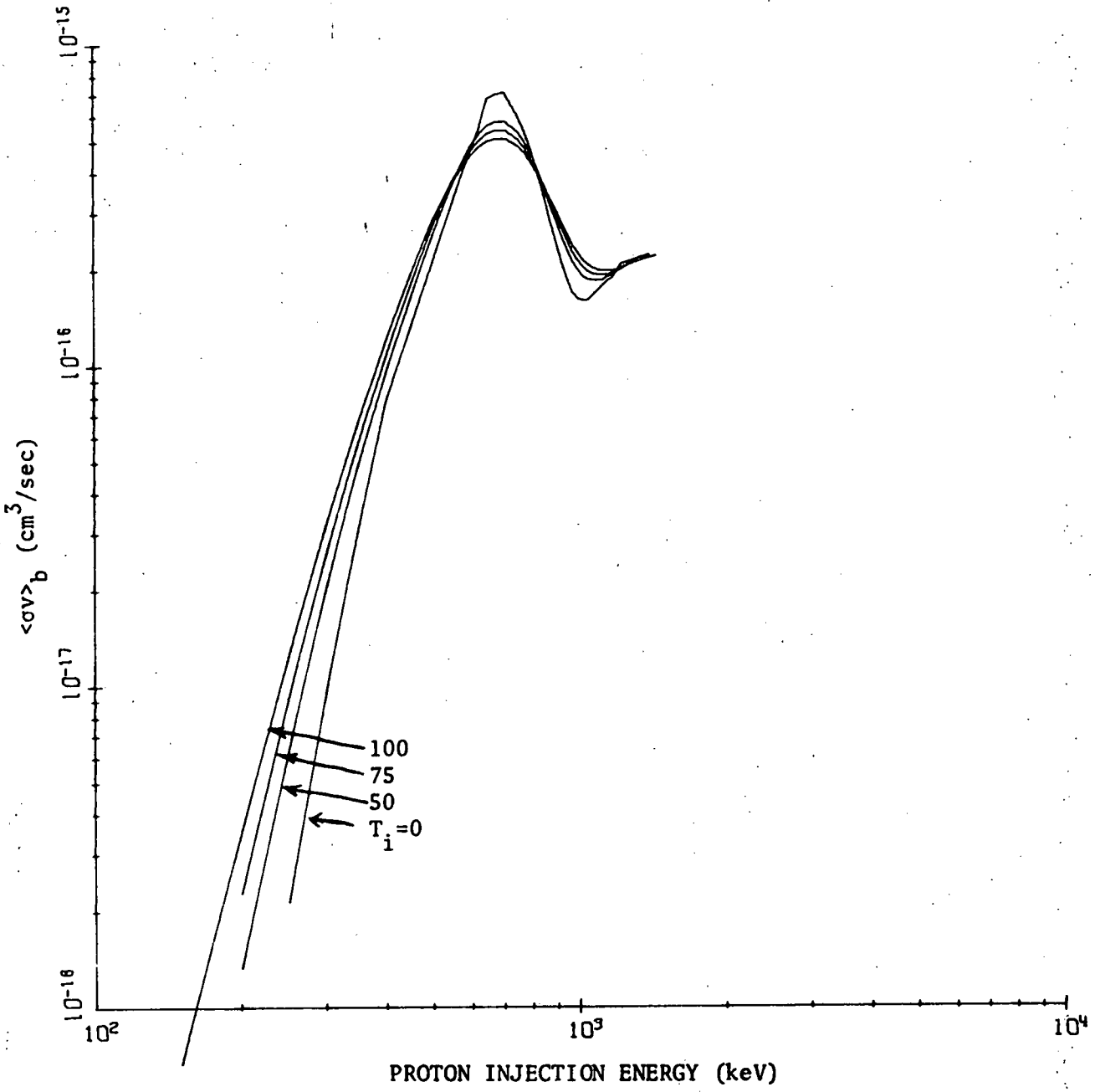
Boron 11 Temperature = 75 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.30066D-24	20.000	0.40348D-23
30.000	0.26090D-22	40.000	0.11459D-21
50.000	0.39269D-21	60.000	0.11289D-20
70.000	0.28434D-20	80.000	0.64573D-20
90.000	0.13487D-19	100.00	0.26289D-19
150.00	0.35751D-18	200.00	0.22553D-17
250.00	0.89093D-17	300.00	0.25309D-16
350.00	0.56323D-16	400.00	0.10544D-15
450.00	0.17547D-15	500.00	0.26688D-15
550.00	0.37090D-15	600.00	0.46696D-15
625.00	0.50255D-15	650.00	0.52812D-15
675.00	0.54014D-15	700.00	0.53879D-15
725.00	0.52554D-15	750.00	0.50159D-15
775.00	0.47045D-15	800.00	0.43444D-15
825.00	0.39639D-15	850.00	0.35878D-15
875.00	0.32325D-15	900.00	0.29118D-15
925.00	0.26353D-15	950.00	0.24066D-15
975.00	0.22246D-15	1000.0	0.20881D-15
1025.0	0.19911D-15	1050.0	0.19291D-15
1075.0	0.18958D-15	1100.0	0.18853D-15
1125.0	0.18917D-15	1150.0	0.19100D-15
1175.0	0.19367D-15	1200.0	0.19681D-15
1225.0	0.20006D-15	1250.0	0.20336D-15
1275.0	0.20662D-15	1300.0	0.20961D-15
1325.0	0.21231D-15	1350.0	0.21478D-15
1375.0	0.21692D-15	1400.0	0.21875D-15
1425.0	0.22026D-15	1450.0	0.22143D-15
1475.0	0.22217D-15	1500.0	0.22263D-15
1525.0	0.22263D-15	1550.0	0.22217D-15
1575.0	0.22120D-15	1600.0	0.21966D-15
1625.0	0.21757D-15	1650.0	0.21487D-15
1675.0	0.21136D-15	1700.0	0.20692D-15
1725.0	0.20161D-15	1750.0	0.19578D-15
1775.0	0.18884D-15	1800.0	0.18083D-15

$\langle\sigma v\rangle_b$ For $^{11}B(p,2^4He)^4He$ assuming beam-Maxwellian distributions.

Boron 11 Temperature = 100 keV

ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)	ENERGY (keV)	$\langle\sigma v\rangle_b$ (cm^3/sec)
10.000	0.40111D-23	20.000	0.34434D-22
30.000	0.16522D-21	40.000	0.58019D-21
50.000	0.16648D-20	60.000	0.41367D-20
70.000	0.92190D-20	80.000	0.18857D-19
90.000	0.35977D-19	100.00	0.64782D-19
150.00	0.66275D-18	200.00	0.34827D-17
250.00	0.12043D-16	300.00	0.31069D-16
350.00	0.64999D-16	400.00	0.11721D-15
450.00	0.18917D-15	500.00	0.27811D-15
550.00	0.37238D-15	600.00	0.45295D-15
625.00	0.48250D-15	650.00	0.50231D-15
675.00	0.51118D-15	700.00	0.50982D-15
725.00	0.49867D-15	750.00	0.47940D-15
775.00	0.45357D-15	800.00	0.42366D-15
825.00	0.39164D-15	850.00	0.35936D-15
875.00	0.32835D-15	900.00	0.29979D-15
925.00	0.27449D-15	950.00	0.25281D-15
975.00	0.23497D-15	1000.0	0.22090D-15
1025.0	0.21032D-15	1050.0	0.20280D-15
1075.0	0.19801D-15	1100.0	0.19537D-15
1125.0	0.19448D-15	1150.0	0.19495D-15
1175.0	0.19639D-15	1200.0	0.19843D-15
1225.0	0.20090D-15	1250.0	0.20359D-15
1275.0	0.20630D-15	1300.0	0.20898D-15
1325.0	0.21140D-15	1350.0	0.21361D-15
1375.0	0.21563D-15	1400.0	0.21727D-15
1425.0	0.21858D-15	1450.0	0.21954D-15
1475.0	0.22010D-15	1500.0	0.22022D-15
1525.0	0.21990D-15	1550.0	0.21909D-15
1575.0	0.21767D-15	1600.0	0.21576D-15
1625.0	0.21315D-15	1650.0	0.20978D-15
1675.0	0.20572D-15	1700.0	0.20131D-15
1725.0	0.19560D-15	1750.0	0.18918D-15
1775.0	0.18177D-15	1800.0	0.17363D-15



Values of $\langle\sigma v\rangle_b$ for injection of boron 11 into a proton background at various temperatures (keV).

Section 8

Composite Plots

NOMENCLATURE

① $T(d,n)^4He$

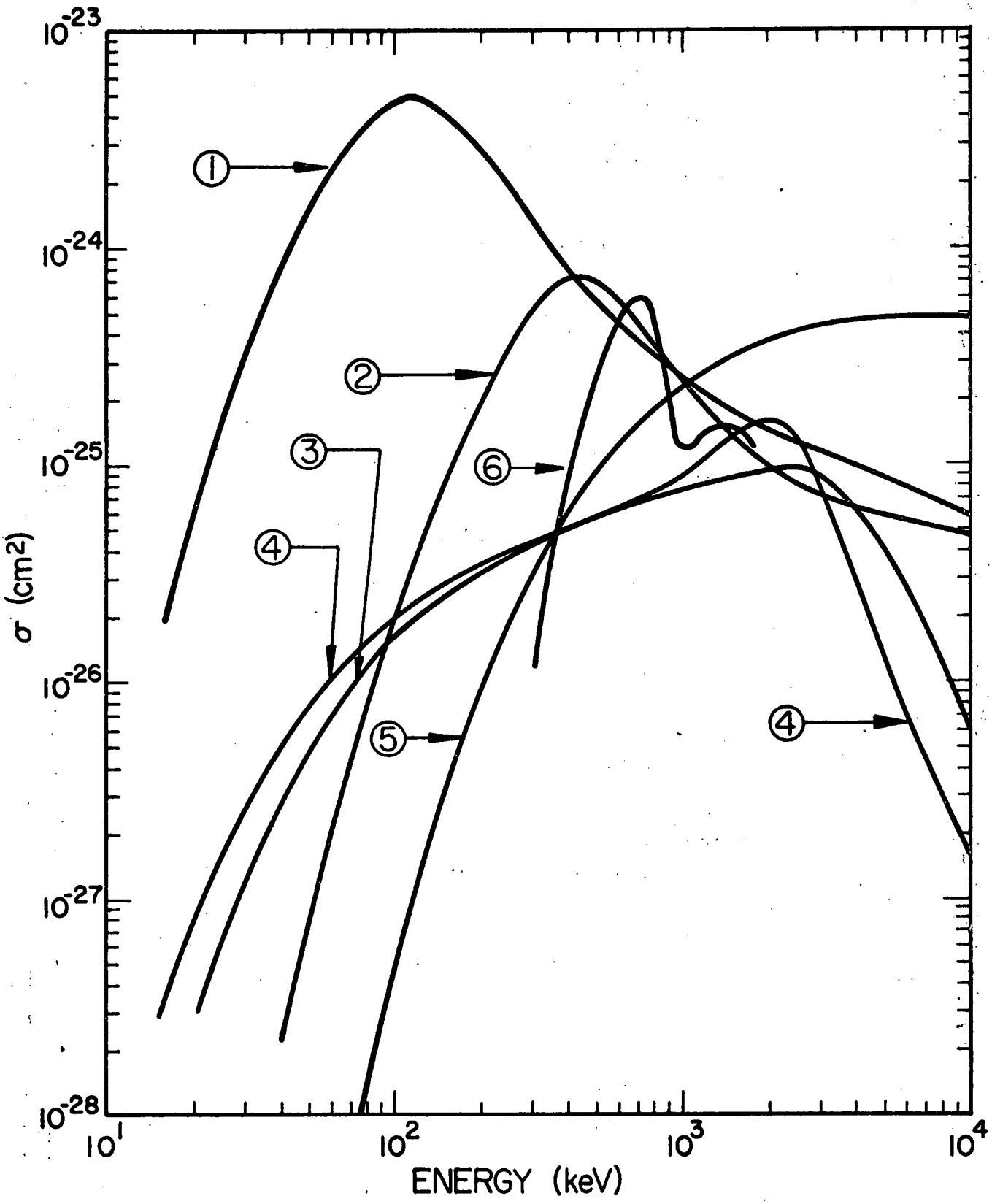
② $^3He(d,p)^4He$

③ $D(d,p)T$

④ $T(t,2n)^4He$

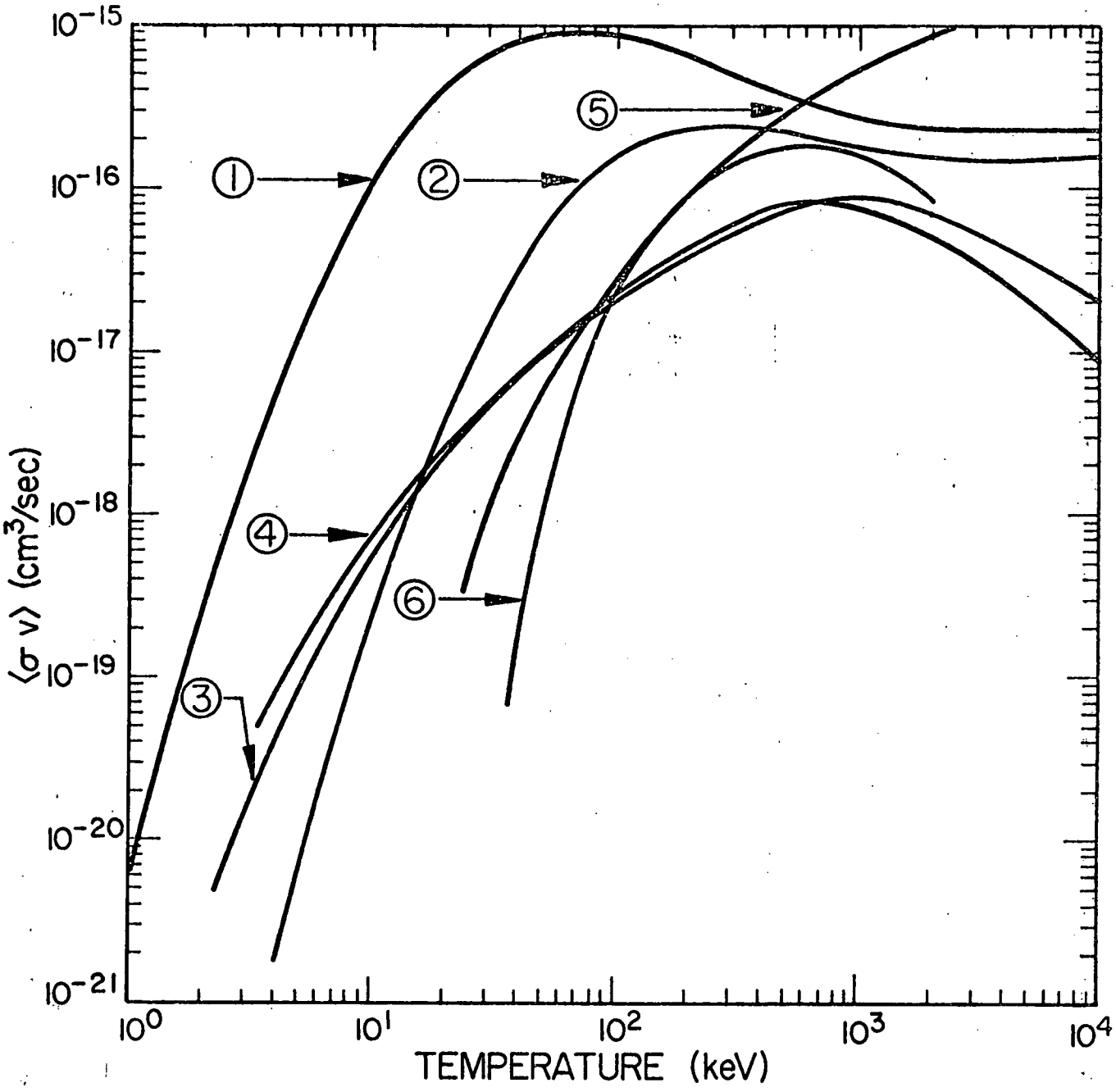
⑤ $T(^3He,X)Y$

⑥ $^{11}B(p,2\,^4He)^4He$



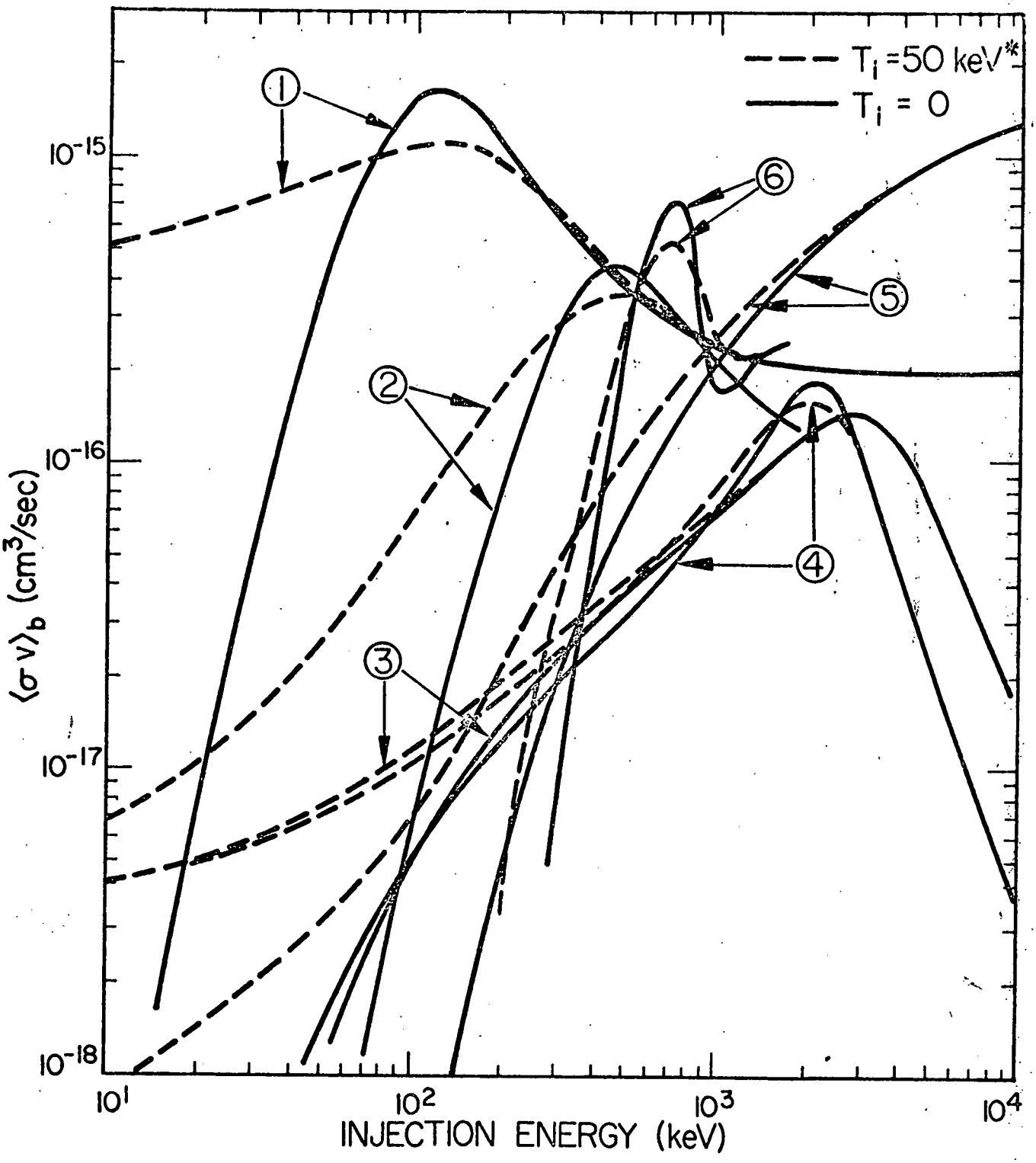
Cross sections for several prominent fusion reactions.

(Nomenclature found on p. 8.1)



Maxwellian-Maxwellian reactivities for several prominent fusion reactions.

(Nomenclature found on p. 8.1)



Beam-Maxwellian reactivities for several prominent fusion reactions.

(Nomenclature found on p. 8.1)

*Except for reaction (6) for which T_i = 100 keV.