

ADF02: ion impact cross-sections with named participant

Provides specific ion impact cross-section data involving one particular participant given in the file naming convention. Ionisation charge transfer and excitation data can be included. Formatting conventions and variable storage are given below.

Utilising subroutines :

ADAS302 ADAS310

Formatted files to ADF02 specification :

Database Status Date = October 24, 1999 Data type =ion/atom cross-section files Data root =/.../adas/adas/adf02/

<i>Primary reactant</i>	<i>Members</i>	<i>Prefix</i>	<i>Library</i>	<i>Comments</i>	<i>Quality</i>
h	h		ionatom	Individually assessed	high
he	he		ionatom	Individually assessed	high
h	sia#h_j97h		sia#h	JET 1997 revision/due for deletion	high
h	sia#h_j99h		sia#h	JET 1997 renamed & extended[1]	high
h	sia#h_rfm#h		sia#h	JET 1993- reformatted[1]	high
h	sia#h_tos#h		sia#h	Toshima & Tawara[1]	high
he	sia#he_j91he		sia#he	JET 1991 with updates[1]	high

Notes: 1. An alteration has been made to the adf02 specification. The indicated datasets have been formatted to the new specification.

The interrogation routine ADAS302 still operates on the old format but there is limited information presented on the processing widget.

Data lines :

NSEL

for ISEL= 1 to NSEL

NENER, ATMS1 , ATMS2 , SLOPE , ETHRES, CTYP, ISEL
(ENER(IE), IE=1,24)

Format:

i5

a11,i4,'/P=',d9.3,'/S=',d9.3,'/A=',d9.3,'/T=',1a3,'/ISEL=',i5
6d10.3

(XSEC(IE), IE=1,24)

6d10.3

repeat

variable identification :

<i>name</i>	<i>meaning</i>
NSEL	number of reactions available
NENER	number of energies given for cross-section
ATMS1	atomic mass of particular participant
ATMS2	atomic mass of colliding particle
SLOPE	power law slope in energy for extrapolation
ETHRES	threshold energy (eV)
CTYP	type of reaction
	CX => charge exchange
	ION => ionisation
	EXC => excitation
ISEL	index of reaction
ENER()	collision energies (eV/amu)
XSEC()	collision cross-sections (cm**2)

Table B2c.

57
H + 0/H + 1 21/P=1.000D+00/S=1.000D+00/A=4.701D+00/E=0.000D+00/T=CX /ISEL= 1
5.000D+02 7.000D+02 1.000D+03 1.500D+03 2.000D+03 3.000D+03
5.000D+03 7.000D+03 1.000D+04 1.500D+04 2.000D+04 3.000D+04
4.000D+04 5.000D+04 6.000D+04 7.000D+04 8.000D+04 1.000D+05
1.500D+05 2.000D+05 3.000D+05
1.960D-15 1.840D-15 1.700D-15 1.550D-15 1.440D-15 1.270D-15
1.060D-15 9.120D-16 7.550D-16 5.760D-16 4.500D-16 2.760D-16
1.650D-16 9.810D-17 5.870D-17 3.600D-17 2.280D-17 9.980D-18
1.920D-18 5.430D-19 8.070D-20
H + 0/HE+ 2 24/P=1.000D+00/S=4.000D+00/A=4.957D+00/E=0.000D+00/T=CX /ISEL= 2
5.000D+02 7.000D+02 1.000D+03 1.500D+03 2.000D+03 3.000D+03
4.000D+03 5.000D+03 7.000D+03 1.000D+04 1.500D+04 2.000D+04
3.000D+04 4.000D+04 5.000D+04 7.000D+04 1.000D+05 1.500D+05
2.000D+05 3.000D+05 4.000D+05 5.000D+05 7.000D+05 1.000D+06

4.940D-17 1.060D-16 2.170D-16 4.230D-16 5.980D-16 8.470D-16
 1.000D-15 1.110D-15 1.220D-15 1.280D-15 1.240D-15 1.120D-15
 8.220D-16 5.490D-16 3.540D-16 1.520D-16 5.160D-17 1.310D-17
 4.590D-18 9.450D-19 2.830D-19 1.050D-19 2.180D-20 3.720D-21

H + 0/H + 1 18/P=1.000D+00/S=1.000D+00/A=4.500D+00/E=0.000D+00/T=CX /ISEL= 57

1.000D+03 1.500D+03 2.000D+03 3.000D+03 5.000D+03 7.000D+03
 1.000D+04 1.500D+04 2.000D+04 3.000D+04 5.000D+04 7.000D+04
 1.000D+05 1.500D+05 2.000D+05 3.000D+05 5.000D+05 7.000D+05
 4.700D-16 4.750D-16 4.750D-16 4.750D-16 4.680D-16 4.500D-16
 4.250D-16 3.780D-16 3.350D-16 2.150D-16 7.200D-17 3.000D-17
 1.000D-17 2.250D-18 7.200D-19 1.150D-19 8.000D-21 1.050D-21

ISEL	TRANS&TYPE	MP	MS	ALF	REFERENCE
1	H+ H CX	1	1	4.701	JANEV & SMITH
2	HE+2 H CX	1	4	4.957	JANEV & SMITH

57 H+ H CX 1 - 1.000 HPS (1989) COMP

NOTES

1 H(1S) IMPACT H+ ----> H TOTAL CHARGE TRANSFER.
 2 H(1S) IMPACT HE+2 ----> HE+ TOTAL CHARGE TRANSFER.

57 H+ TARGET H(N) ----> H+ TOTAL CHARGE EXCHANGE.

REFERENCES

- [1] TOSHIMA,N & TAWARA,H.
NIFS-DATA-26,
JULY 1995.
- [2] FRITSCH,W. & LIN,C.D.
PHYSICS REPORTS.
VOL. 202, NOS. 1 & 2,
APRIL 1991.
- [3] JANEV,R.K. & SMITH,J.J.
J.NUC.FUSION. (SUPL.),
VOL.4 , 1993.

SCALING FORMULAE

ISEL NOS.	SCALING RECIPE
46	EA(I)=EA(I)*Z0
47	OA(I)=OA(I)*Z0
48	EA(I)=EA(I)*Z0
	OA(I)=OA(I)*Z0
	EA(I)=EA(I)*Z0

