ADF07: direct resolved electron impact ionisation data collections

Provides electron impact ionisation rate coefficients for ions optionally with resolution into metastable initial and final states. Formatting conventions and variable storage are given below.

Utilising subroutines :

ADAS208 ADAS502

Formatted files to ADF07 specification :

Database Status Date = March 17, 2003 Data type =szd files Data root =/.../adas/adas/adf07/

Element	*Members*	*Library*	*Comments*	*Resolution*	*Quality*
Hydrogen	h,h0	szd93#h	CLM normalised, S&H split	resolved	high
Helium	he,he0,he1	szd93#he	CLM normalised, S&H split	resolved	high
Lithium	li0,li1,li2	szd02#li	Loch, Colgan	resolved	high
Lithium	li	szd93#li	CLM normalised	unresolved	high
Beryllium	be,be0,be1, be2,be3	szd93#be	CLM normalised, S&H split	resolved	medium
Boron	b	szd93#b	CLM normalised	unresolved	high
Carbon	c,c0,c1,c2,c3,c4,c5	szd93#c	CLM normalised, S&H split	resolved	medium
Nitrogen	n	szd93#n	CLM normalised	unresolved	high
Nitrogen	n,n0,n1,n2,n3,n4,n5,n6	szd96#n	CLM normalised, S&H split	resolved	medium
Oxygen	o,o0,o1,o2,o3,o4,o5,o6,o7	szd93#o	CLM normalised, S&H split	resolved	medium
Fluorine	f	szd93#f	CLM normalised	unresolved	high
Neon	ne	szd93#ne	CLM normalised	unresolved	high
Argon	ar1	szd97#ar	Griffin, normalised	resolved	high
Chromium	cr,cr0, cr1	szd93#cr	Griffin, normalised	resolved	high
Iron	fe	szd93#fe	A&R	unresolved	medium
Molybdenum	mo,mo0,mo1	szd93#mo	Griffin, normalised	resolved	high

Notes: 1. The element member contains a preferred compilation for all the ions of the element. The ion members contain just the individual ion resolved data.

2. CLM normalised refers to the Culham Laboratory Reports CLM-R216- & CLM-R270 for the total stage to stage coefficients.

3. S&H refers to splitting into metastable resolved ionisation coefficients using the method of Summers & Hooper. Results are normalised to the stage to stage total.

4. Griffin refers to metastable resolved data extracted from the detailed adf23 data sets prepared by Griffin, Pindzola or Badnell.

   This data is also normalised as specified in the dataset comments. Griffin data will eventually replace all the S&H split data.

5. A&R refers to Arnaud & Raymond (1992) Astrophys. J. 398, 394.

Data lines :	*Format:*
NSEL, TEXT	i5,4x,'/',1a38,'/'
for ISEL= 1 to NSEL	
SYMB, IZ, SYMB IZ1, NTE, BWNO, METI, METF, ISEL	c2,'+',i2,'/',c2,'+',i2'/',i5,'/',7x,f18,9x,'i2,9x,i2,7x,i3
(TEV(IT), IT=1,24)	6e10.3
(SZD(IT), IT=1,24)	6e10.3
repeat	

variable identification :

name	*meaning*
NSEL	number of reactions available
TEXT	information
SYMB	element chemical symbol
IZ	initial ion charge
IZ1	final ion charge
NTE	number of temperatures
BWNO	effective ionisation potential (cm-1)
METI	initial state metastable index
METF	final state metastable index
ISEL	transition index

TEV() electron temperatures (eV)

SZD() zero density ionisation rate coefficient (cm**3 sec-1)

Table B7c - example.

```
    8    /BE  IONISATION RATE COEFFICIENTS   /
BE+ 0/BE+ 1/   24/I.P. =           75192.3/ICODE =  1/FCODE =  1/ISEL=   1
 1.000D+00 2.000D+00 3.000D+00 4.000D+00 5.000D+00 7.000D+00
 1.000D+01 1.500D+01 2.000D+01 3.000D+01 4.000D+01 5.000D+01
 7.000D+01 1.000D+02 1.500D+02 2.000D+02 3.000D+02 4.000D+02
 5.000D+02 7.000D+02 1.000D+03 2.000D+03 5.000D+03 1.000D+04
 1.694D-12 2.947D-10 1.827D-09 4.741D-09 8.754D-09 1.733D-08
 3.016D-08 4.737D-08 5.983D-08 7.577D-08 8.506D-08 9.086D-08
 9.715D-08 1.008D-07 1.015D-07 1.002D-07 9.640D-08 9.266D-08
 8.932D-08 8.378D-08 7.750D-08 6.505D-08 4.975D-08 3.978D-08
BE+ 0/BE+ 1/   24/I.P. =           53212.0/ICODE =  2/FCODE =  1/ISEL=   2
 1.000D+00 2.000D+00 3.000D+00 4.000D+00 5.000D+00 7.000D+00
 1.000D+01 1.500D+01 2.000D+01 3.000D+01 4.000D+01 5.000D+01
 7.000D+01 1.000D+02 1.500D+02 2.000D+02 3.000D+02 4.000D+02
 5.000D+02 7.000D+02 1.000D+03 2.000D+03 5.000D+03 1.000D+04
 2.738D-11 1.313D-09 5.407D-09 1.148D-08 1.845D-08 3.271D-08
 5.189D-08 7.648D-08 9.407D-08 1.168D-07 1.3044-07 1.392D-07
 1.493D-07 1.556D-07 1.580D-07 1.568D-07 1.518D-07 1.437D-07
 1.412D-07 1.323D-07 1.221D-07 1.016D-07 7.663D-08 6.067D-08
BE+ 1/BE+ 2/   24/I.P. =          146881.7/ICODE =  1/FCODE =  0/ISEL=   3
 1.000D+00 2.000D+00 3.000D+00 4.000D+00 5.000D+00 7.000D+00
 1.000D+01 1.500D+01 2.000D+01 3.000D+01 4.000D+01 5.000D+01
 7.000D+01 1.000D+02 1.500D+02 2.000D+02 3.000D+02 4.000D+02
 5.000D+02 7.000D+02 1.000D+03 2.000D+03 5.000D+03 1.000D+04
 1.737D-17 1.042D-12 2.514D-11 1.263D-10 3.365D-10 1.047D-09
 2.488D-09 4.939D-09 6.986D-09 9.886D-09 1.172D-08 1.294D-08
 1.438D-08 1.536D-08 1.585D-08 1.586D-08 1.547D-08 1.499D-08
 1.453D-08 1.372D-08 1.278D-08 1.084D-08 8.370D-09 6.732D-09
BE+ 1/BE+ 2/   24/I.P. =          146400.5/ICODE =  1/FCODE =  1/ISEL=   4
 1.000D+00 2.000D+00 3.000D+00 4.000D+00 5.000D+00 7.000D+00
 1.000D+01 1.500D+01 2.000D+01 3.000D+01 4.000D+01 5.000D+01
 7.000D+01 1.000D+02 1.500D+02 2.000D+02 3.000D+02 4.000D+02
 5.000D+02 7.000D+02 1.000D+03 2.000D+03 5.000D+03 1.000D+04
 9.310D-17 1.085D-12 2.597D-11 1.300D-10 3.456D-10 1.074D-09
 2.554D-09 5.080D-09 7.199D-09 1.020D-08 1.210D-08 1.333D-08
 1.475D-08 1.565D-08 1.597D-08 1.582D-08 1.519D-08 1.452D-08
 1.392D-08 1.293D-08 1.184D-08 9.781D-09 7.424D-09 5.943D-09


                          .       .       .

BE+ 2/BE+ 3/   24/I.P. =          284729.0/ICODE =  2/FCODE =  1/ISEL=   7
 2.000D+00 3.000D+00 4.000D+00 5.000D+00 7.000D+00 1.000D+01
 1.500D+01 2.000D+01 3.000D+01 4.000D+01 5.000D+01 7.000D+01
 1.000D+02 1.500D+02 2.000D+02 3.000D+02 4.000D+02 5.000D+02
 7.000D+02 1.000D+03 2.000D+03 4.000D+03 5.000D+03 1.000D+04
 4.527D-17 1.876D-14 3.943D-13 2.496D-12 2.109D-11 1.077D-10
 3.950D-10 7.721D-10 1.552D-09 2.240D-09 2.817D-09 3.696D-09
 4.556D-09 5.344D-09 5.750D-09 6.094D-09 6.189D-09 6.188D-09
 6.082D-09 5.863D-09 5.233D-09 4.482D-09 4.235D-09 3.494D-09
BE+ 3/BE+ 4/   24/I.P. =         1756004.0/ICODE =  1/FCODE =  1/ISEL=   8
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 2.000D+00 3.000D+00 4.000D+00 5.000D+00 7.000D+00 1.000D+01
 1.500D+01 2.000D+01 3.000D+01 4.000D+01 5.000D+01 7.000D+01
 1.000D+02 1.500D+02 2.000D+02 3.000D+02 4.000D+02 5.000D+02
 7.000D+02 1.000D+03 2.000D+03 4.000D+03 5.000D+03 1.000D+04
 3.624D-58 2.659D-42 2.371D-34 1.430D-29 4.313D-24 5.813D-20
 9.994D-17 4.285D-15 1.917D-13 1.319D-12 4.255D-12 1.657D-11
 4.692D-11 1.075D-10 1.641D-10 2.520D-10 3.123D-10 3.545D-10
 4.076D-10 4.477D-10 4.796D-10 4.642D-10 4.524D-10 4.032D-10
C-------------------------------------------------------------------------------
C  ELECTRON IMPACT IONISATION RATE COEFFICIENT LIST:
C
C   ISEL  INITIAL MET.    FINAL  MET.           SOURCE
C           ION   CODE     ION   CODE
C   ----  ------- ----   ------- ----     --------------------------
C     1   BE+ 0    1     BE+ 1    1       *BELL ET AL. (1982) CLM-R216
C     2   BE+ 0    2     BE+ 1    1       *DICKSON AND SUMMERS 1991
C     3   BE+ 1    1     BE+ 2    0       *BELL ET AL. (1982) CLM-R216
C     4   BE+ 1    1     BE+ 2    1       *YOUNGER, (1981) JQSRT 26, NO. 4
C     5   BE+ 1    1     BE+ 2    2       *YOUNGER, (1981) JQSRT 26, NO. 4
C     6   BE+ 2    1     BE+ 3    1       *BELL ET AL. (1982) CLM-R216
C     7   BE+ 2    1     BE+ 3    2       *ATTAOURTI (1991) SCALING BCHID
C     8   BE+ 3    1     BE+ 4    1       *BELL ET AL. (1982) CLM-R216
C
C
C         PREFERRED DATA INDICATED BY *
C
C  NOTES.
C ------
C
C   ISEL  INITIAL MET.    DESIG.             FINAL  MET.    DESIG.
C           ION   CODE                        ION   CODE
C   ----  ------- ---- ---------------      ------- ---- ---------------
C     1   BE+ 0    1     1S2 2S2(1S)        BE+ 1    1     1S2 2S(2S)
C     2   BE+ 0    2     2S  2P (3P)        BE+ 1    1     1S2 2S(2S)
C     3   BE+ 1    1     1S2 2S (2S)        BE+ 2    0     *
C     4   BE+ 1    1     1S2 2S (2S)        BE+ 2    1     1S2 (1S)
C     5   BE+ 1    1     1S2 2S (2S)        BE+ 2    2     1S 2S(3S)
C     6   BE+ 2    1     1S2 (1S)           BE+ 3    1     1S (2S)
C     7   BE+ 2    2     1S 2S (3S)         BE+ 3    1     1S (2S)
C     8   BE+ 3    1     1S  (2S)           BE+ 4    1     *  (1S)
C
C
C
C            WILLIAM J. DICKSON     JET    11TH MAY 1992
C-------------------------------------------------------------------------------
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