



 AHELP for CIAO 3.4

xspecabundan

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Synopsis

Performs the XSPEC command abund.

Syntax

```
sherpa> XSPEC ABUNDAN {<arg> | FILE <filename>}
where <arg> is one of the options listed in the table below.
```

Description

This commands sets the elemental abundance table used in XSPEC plasma-code models. (It does not set abundances for xswabs.)

Allowed Arguments

Name	Description
angr	default value; Anders E. & Grevesse N. (1989, Geochimica et Cosmochimica Acta 53, 197)
feld	Feldman U. (1992, Physica Scripta 46, 202)
aneb	Anders E. & Ebihara (1982, Geochimica et Cosmochimica Acta 46, 2363)
grsa	Grevesse, N. & Sauval, A.J. (1998, Space Science Reviews 85, 161)
wilm	Wilms, Allen & McCray (2000, ApJ 542, 914)
lodd	The solar photospheric abundances in Lodders, K (2003, ApJ 591, 1220)
file <filename>	<filename> is an ASCII file containing 30 lines with one number on each line.

When using the command, the argument can be shortened as long as it remains unique; see Example 3 below.

All abundances are number relative to H.

Tables for xspecabundan Arguments

Element	angr	feld	aneb	grsa	wilm	lodd
H	1.00e+0	1.00e+0	1.00e+0	1.00e+0	1.00e+0	1.00e+0

He	9.77e-2	9.77e-2	8.01e-2	8.51e-2	9.77e-2	7.92e-2
Li	1.45e-11	1.26e-11	2.19e-9	1.26e-11	0.00	1.90e-9
B	1.41e-11	2.51e-11	2.87e-11	2.51e-11	0.00	2.57e-11
Be	3.98e-10	3.55e-10	8.82e-10	3.55e-10	0.00	6.03e-10
C	3.63e-4	3.98e-4	4.45e-4	3.31e-4	2.40e-4	2.45e-4
N	1.12e-4	1.00e-4	9.12e-5	8.32e-5	7.59e-5	6.76e-5
O	8.51e-4	8.51e-4	7.39e-4	6.76e-4	4.90e-4	4.90e-4
F	3.63e-8	3.63e-8	3.10e-8	3.63e-8	0.00	2.88e-8
Ne	1.23e-4	1.29e-4	1.38e-4	1.20e-4	8.71e-5	7.41e-5
Na	2.14e-6	2.14e-6	2.10e-6	2.14e-6	1.45e-6	1.99e-6
Mg	3.80e-5	3.80e-5	3.95e-5	3.80e-5	2.51e-5	3.55e-5
Al	2.95e-6	2.95e-6	3.12e-6	2.95e-6	2.14e-6	2.88e-6
Si	3.55e-5	3.55e-5	3.68e-5	3.55e-5	1.86e-5	3.47e-5
P	2.82e-7	2.82e-7	3.82e-7	2.82e-7	2.63e-7	2.88e-7
S	1.62e-5	1.62e-5	1.89e-5	2.14e-5	1.23e-5	1.55e-5
Cl	1.88e-7	1.88e-7	1.93e-7	3.16e-7	1.32e-7	1.82e-7
Ar	3.63e-6	4.47e-6	3.82e-6	2.51e-6	2.57e-6	3.55e-6
K	1.32e-7	1.32e-7	1.39e-7	1.32e-7	0.00	1.29e-7
Ca	2.29e-6	2.29e-6	2.25e-6	2.29e-6	1.58e-6	2.19e-6
Sc	1.26e-9	1.48e-9	1.24e-9	1.48e-9	0.00	1.17e-9
Ti	9.77e-8	1.05e-7	8.82e-8	1.05e-7	6.46e-8	8.32e-8
V	1.00e-8	1.00e-8	1.08e-8	1.00e-8	0.00	1.00e-8
Cr	4.68e-7	4.84e-7	4.93e-7	4.68e-7	3.24e-7	4.47e-7
Mn	2.45e-7	2.45e-7	3.50e-7	2.45e-7	2.19e-7	3.16e-7
Fe	4.68e-5	3.24e-5	3.31e-5	3.16e-5	2.69e-5	2.95e-5
Co	8.60e-8	8.60e-8	8.27e-8	8.32e-8	8.32e-8	8.13e-8
Ni	1.78e-6	1.78e-6	1.81e-6	1.78e-6	1.12e-6	1.66e-6
Cu	1.62e-8	1.62e-8	1.89e-8	1.62e-8	0.00	1.82e-8
Zn	3.98e-8	3.98e-8	4.63e-8	3.98e-8	0.00	4.27e-8

This information is taken from the [XSpec User's Guide](#). Version 11.3.1.x of the XSpec models is supplied with CIAO 3.2.

Example 1

Run the XSPEC command abund, setting abundances to Feldman:

```
sherpa> XSPEC ABUNDAN FELD
Abundances set to Feldman
```

Example 2

Reset the abundances to the default value:

```
sherpa> XSPEC ABUNDAN ANGR
Abundances set to Anders & Grevesse
```

Example 3

The argument can be shortened as long as it remains unique.

```
sherpa> XSPEC ABUNDAN W
Abundances set to Wilms et al.
sherpa> XSPEC ABUNDAN F
Abundances set to Feldman
sherpa> XSPEC ABUNDAN G
Abundances set to Grevesse & Sauval
```

In the case of the two arguments that begin with "AN", "ANGR" takes precedence over "ANE" if only the first or second letter is given:

```
sherpa> XSPEC ABUNDAN A
Abundances set to Anders & Grevesse
sherpa> XSPEC ABUNDAN AN
Abundances set to Anders & Grevesse
sherpa> XSPEC ABUNDAN ANE
Abundances set to Anders & Ebihara
```

Example 4

Read custom abundances from a file:

```
sherpa> XSPEC ABUNDAN FILE abund.txt
Abundances set to those read from file
```

Bugs

For a list of known bugs and issues with the XSPEC models, please visit the [XSPEC bugs page](#).

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URL:
<http://cxc.harvard.edu/ciao3.4/xspecabundan.html>
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