```
# ACCUMULATED TABLE OF BOND VALENCE PARAMETERS

Data_BOND_VALENCE_PARAMETERS_2006-05-02

# BVPARM.CIF
_audit_conform_dict_name        cif_core.dic
_audit_conform_dict_version     2.2


#*****************************************************************
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# idbrown@mcmaster.ca
#
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#
# The values reported here are taken from the literature and
# other sources and the author does not warrant their correctness
# nor accept any responsibility for errors.  Users are advised to
# consult the primary sources.
#
#*****************************************************************
#
# The parameters given in the main table are the values of Ro and
# B used in the equation:
#
#     bond valence = exp((Ro-R)/B)
#
# where R is the bond length.  All values are in Angstrom units.
# Where significantly different values have been reported in the
# literature, they are listed in decreasing order of reliability.
#
#     Bond valence parameters for atoms whose oxidation state is
# given as 9 do not have an oxidation state
# specified in the original citation.  They may apply to a
# particular, but unspecified, oxidation state or they may be
# intended to apply to all oxidation states.
#
# The ammonium ion is listed under the symbol NH.
#
#     The list below is formatted and is designed to be read
# either as a crystallographic information file (CIF) or as a
# fixed format file once the text has been stripped off.
##########################################################################3

_audit_creation_date         2001-02-21
_audit_update_record
;2001-03-13 Ref m deleted.
 2001-06-01
 2001-06-21 new ref c and d added.
 2002-03-22 new ref q added
 2003-02-17 refs m, z and aa added
 2003-02-19 corrected CIF errors
 2004-08-12 correction of errors
 2006-05-02 refs ag to ai added
;
_audit_author_name           'I. David Brown'
_audit_author_address
;                            Brockhouse Institute for Materials Research
                             McMaster University
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                             Hamilton, Ontario, Canada L8S 4M1
;
_audit_contact_author_name   'I. David Brown'
_audit_contact_author_email  idbrown@mcmaster.ca

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     _valence_ref_id
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  a 'Brown and Altermatt, (1985), Acta Cryst. B41, 244-247 (empirical)'
  b 'Brese and O'Keeffe, (1991), Acta Cryst. B47, 192-197 (extrapolated)'
  c 'Adams, 2001, Acta Cryst. B57, 278-287 (includes second neighbours)'
  d 'Hu et al. (1995) Inorg. Chim. Acta, 232, 161-165. '
  e 'I.D.Brown Private communication'
  f 'Brown et al. (1984) Inorg. Chem. 23, 4506-4508'
  g 'Palenik (1997) Inorg. Chem. 36 4888-4890'
  h 'Kanowitz and Palenik (1998) Inorg. Chem. 37 2086-2088'
  i 'Wood and Palenik (1998) Inorg. Chem. 37 4149-4151'
  j 'Liu and Thorp (1993) Inorg. Chem. 32 4102-4105'
  k 'Palenik (1997) Inorg. Chem. 36 3394-3397'
  l 'Shields, Raithby, Allen and Motherwell (1999) Acta Cryst.B56, 455-465'
  m 'Chen, Zhou and Hu (2002) Chinese Sci. Bul. 47, 978-980.'
  n 'Kihlbourg (1963) Ark. Kemi 21 471; Schroeder 1975 Acta Cryst. B31, 2294'
  o 'Allmann (1975) Monatshefte Chem. 106, 779'
  p 'Zachariesen (1978) J.Less Common Metals 62, 1'
  q 'Krivovichev and Brown (2001) Z. Krist. 216, 245'
  r 'Burns, Ewing and Hawthorne (1997) Can. Miner. 35,1551-1570'
  s 'Garcia-Rodriguez, et al. (2000) Acta Cryst. B56, 565-569'
  t 'Mahapatra et al. (1996) J. Amer.Chem. Soc. 118, 11555'
  u 'Wood and Palenik (1999) Inorg. Chem. 38, 1031-1034'
  v 'Wood and Palenik (1999) Inorg. Chem. 38, 3926-3930'
  w 'Wood, Abboud, Palenik and Palenik (2000) Inorg. Chem. 39, 2065-2068'
  x 'Tytko, Mehnike and Kurad (1999) Structure and Bonding 93, 1-66'
  y 'Gundemann, et al.(1999) J. Phys. Chem. A 103, 4752-4754'
  z 'Zocchi (2000) Solid State Sci. 2 383-387'
 aa 'Jensen, Palenik and Tiekiak (2001) Polyhedron 20, 2137'
 ab 'Roulhac and Palenik (2002) Inorg. Chem. 42, 118-121'
 ac 'Holsa et al.(2002) J.Solid State Chem 165, 48-55'
 ae 'Trzesowska, Kruszynski & Bartezak (2004) Acta Cryst. B60, 174-178'
 af 'Locock & Burns (2004) Z.Krist. 219, 267-271'
 ag 'Hu & Zhou (2004) Z. Krist. 219 614-620'
 ah 'Trzesowska, Kruszynski & Bartczak (2005) Acta Cryst. B61 429-434'
 ai 'Palenik (2003) Inorg. Chem. 42, 2725-2728'


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Ac 3   O  -2    2.24     0.37     b   ?
Ac 3   O  -2    2.29     0.35     p   ?
Ac 3   F  -1    2.13     0.37     b   ?
Ac 3   F  -1    2.10     0.40     p   ?
Ac 3   Cl -1    2.63     0.37     b   ?
Ac 3   Cl -1    2.60     0.40     p   ?
Ac 3   Br -1    2.75     0.40     p   ?
Ag 1   O  -2    1.842    0.37     a   ?
Ag 1   O  -2    1.805    0.37     b   ?
Ag 1   S  -2    2.119    0.37     a   ?
Ag 1   F  -1    1.80     0.37     b   ?
Ag 1   Cl -1    2.09     0.37     b   ?
Ag 2   F  -1    1.79     0.37     e   unchecked
Ag 3   F  -1    1.83     0.37     e   unchecked
```

Ag 9	Br −1	2.22	0.37	b	?
Ag 9	I −1	2.38	0.37	b	?
Ag 9	Se −2	2.26	0.37	b	?
Ag 9	Te −2	2.51	0.37	b	?
Ag 9	N −3	1.85	0.37	b	?
Ag 9	P −3	2.22	0.37	b	?
Ag 9	As −3	2.30	0.37	b	?
Ag 9	H −1	1.50	0.37	b	?
Al 3	O −2	1.620	0.37	e	?
Al 3	O −2	1.644	0.38	o	?
Al 3	S −2	2.21	0.37	e	unchecked
Al 3	S −2	2.13	0.37	b	?
Al 3	Se −2	2.27	0.37	b	?
Al 3	Te −2	2.48	0.37	b	?
Al 3	F −1	1.545	0.37	a	?
Al 3	Cl −1	2.032	0.37	a	?
Al 3	Br −1	2.20	0.37	b	?
Al 3	I −1	2.41	0.37	b	?
Al 3	N −3	1.79	0.37	b	?
Al 3	P −3	2.24	0.37	b	?
Al 3	As −3	2.30	0.37	b	?
Al 3	H −1	1.45	0.37	b	?
Am 3	O −2	2.11	0.37	b	?
Am 3	O −2	2.13	0.35	p	?
Am 3	F −1	2.00	0.37	b	?
Am 3	F −1	1.98	0.40	p	?
Am 3	Cl −1	2.48	0.37	b	?
Am 3	Cl −1	2.45	0.40	p	?
Am 3	Br −1	2.59	0.40	p	?
Am 4	O −2	2.08	0.37	p	?
Am 4	O −2	2.12	0.37	e	unchecked
Am 4	F −1	1.96	0.40	p	?
Am 5	O −2	2.07	0.35	p	?
Am 5	F −1	1.95	0.40	p	?
Am 6	O −2	2.05	0.35	p	?
Am 6	F −1	1.95	0.40	p	?
Am 5	O −2	2.12	0.37	e	unchecked
As 2	S −2	2.24	0.37	e	unchecked
As 2	Se −2	2.38	0.37	e	unchecked
As 3	O −2	1.789	0.37	a	?
As 3	S −2	2.272	0.37	a	?
As 3	Se −2	2.40	0.37	e	unchecked
As 3	Te −2	2.65	0.37	e	unchecked
As 3	F −1	1.70	0.37	b	?
As 3	Cl −1	2.16	0.37	b	?
As 3	Br −1	2.35	0.37	e	unchecked
As 3	I −1	2.58	0.37	e	unchecked
As 3	C −4	1.93	0.37	b	?
As 5	O −2	1.767	0.37	a	?
As 5	S −2	2.28	0.37	e	unchecked
As 5	F −1	1.620	0.37	a	?
As 5	Cl −2	2.14	0.37	b	?
Au 1	Cl −1	2.02	0.37	e	unchecked
Au 1	I −1	2.35	0.37	e	unchecked
Au 3	O −2	1.89	0.37	e	?
Au 3	O −2	1.833	0.37	b	?
Au 3	S −2	2.39	0.35	e	unchecked
Au 3	F −1	1.89	0.37	e	unchecked
Au 3	F −1	1.81	0.37	b	?
Au 3	Cl −1	2.17	0.37	b	?
Au 3	Br −1	2.32	0.37	e	unchecked
Au 3	I −1	2.54	0.37	e	unchecked
Au 3	N −3	1.94	0.35	e	unchecked
Au 5	F −1	1.80	0.37	e	unchecked
Au 9	S −2	2.03	0.37	b	?
Au 9	Se −2	2.18	0.37	b	?
Au 9	Te −2	2.41	0.37	b	?
Au 9	Br −1	2.12	0.37	b	?
Au 9	I −1	2.34	0.37	b	?

Au 9	N −3	1.72	0.37	b	?
Au 9	P −3	2.14	0.37	b	?
Au 9	As −3	2.22	0.37	b	?
Au 9	H −1	1.37	0.37	b	?
B 3	O −2	1.371	0.37	a	?
B 3	S −2	1.77	0.37	e	unchecked
B 3	S −2	1.82	0.37	b	?
B 3	Se −2	1.95	0.37	b	?
B 3	Te −2	2.20	0.37	b	?
B 3	F −1	1.281	0.37	a	?
B 3	F −1	1.31	0.37	b	?
B 3	Cl −1	1.74	0.37	b	?
B 3	Br −1	1.88	0.37	b	?
B 3	I −1	2.10	0.37	b	?
B 3	N −3	1.47	0.37	b	?
B 3	P −3	1.88	0.37	b	?
B 3	As −3	1.97	0.37	b	?
B 3	H −1	1.14	0.37	b	?
B 3	B 3	1.402	0.37	e	unchecked
Ba 2	O −2	2.285	0.37	a	?
Ba 2	S −2	2.769	0.37	a	?
Ba 2	Se −2	2.88	0.37	b	?
Ba 2	Te −2	3.08	0.37	b	?
Ba 2	F −1	2.188	0.37	a	?
Ba 2	Cl −1	2.69	0.37	b	?
Ba 2	Br −1	2.88	0.37	b	?
Ba 2	I −1	3.13	0.37	b	?
Ba 2	N −3	2.47	0.37	b	?
Ba 2	P −3	2.88	0.37	b	?
Ba 2	As −3	2.96	0.37	b	?
Ba 2	H −1	2.22	0.37	b	?
Be 2	O −2	1.381	0.37	a	?
Be 2	S −2	1.83	0.37	b	?
Be 2	Se −2	1.97	0.37	b	?
Be 2	Te −2	2.21	0.37	b	?
Be 2	F −1	1.281	0.37	a	?
Be 2	Cl −1	1.76	0.37	b	?
Be 2	Br −1	1.90	0.37	b	?
Be 2	I −1	2.10	0.37	b	?
Be 2	N −3	1.50	0.37	b	?
Be 2	P −3	1.95	0.37	b	?
Be 2	As −3	2.00	0.37	b	?
Be 2	H −1	1.11	0.37	b	?
Bi 3	O −2	2.094	0.37	a	?
Bi 3	S −2	2.570	0.37	a	?
Bi 2	Se −2	2.70	0.35	e	unchecked
Bi 3	F −1	1.99	0.37	b	?
Bi 3	Cl −1	2.48	0.37	b	?
Bi 3	Cl −1	2.40	0.37	e	unchecked
Bi 3	Br −1	2.59	0.37	e	unchecked
Bi 3	I −1	2.82	0.37	e	unchecked
Bi 3	N −3	2.02	0.35	e	unchecked
Bi 5	O −2	2.06	0.37	b	?
Bi 5	F −1	1.97	0.37	b	?
Bi 5	Cl −1	2.44	0.37	b	?
Bi 9	Br −1	2.62	0.37	b	?
Bi 9	I −1	2.84	0.37	b	?
Bi 9	S −2	2.55	0.37	b	?
Bi 9	Se −2	2.72	0.37	b	?
Bi 9	Te −2	2.87	0.37	b	?
Bi 9	N −3	2.24	0.37	b	?
Bi 9	P −3	2.63	0.37	b	?
Bi 9	As −3	2.72	0.37	b	?
Bi 9	H −1	1.97	0.37	b	?
Bk 3	O −2	2.08	0.37	b	?
Bk 3	O −2	2.10	0.35	p	?
Bk 3	F −1	1.96	0.37	b	?
Bk 3	F −1	1.95	0.40	p	?
Bk 3	Cl −1	2.35	0.37	e	unchecked

```
Bk 3   Cl −1    2.46     0.37     b   ?
Bk 3   Cl −1    2.42     0.40     p   ?
Bk 3   Br −1    2.56     0.40     p   ?
Bk 4   O  −2    2.07     0.35     p   ?
Bk 4   F  −1    1.93     0.40     p   ?
Br 3   O  −2    1.90     0.37     e   unchecked
Br 3   F  −1    1.75     0.37     e   unchecked
Br 5   O  −2    1.84     0.37     e   unchecked
Br 5   F  −1    1.76     0.37     e   unchecked
Br 7   O  −2    1.81     0.37     b   ?
Br 7   F  −1    1.72     0.37     b   ?
Br 7   Cl −1    2.19     0.37     b   ?
C  2   O  −2    1.366    0.37     e   unchecked
C  2   Cl −1    1.410    0.37     e   unchecked
C  4   O  −2    1.390    0.37     a   ?
C  4   O  −2    1.40     0.26     o   ?
C  4   C   4    1.54     0.37     e   ?
C  4   S  −2    1.80     0.37     e   unchecked
C  4   F  −1    1.32     0.37     b   ?
C  4   F  −1    1.41     0.37     e   unchecked
C  4   Cl −1    1.76     0.37     b   ?
C  4   Br −1    1.91     0.37     e   unchecked
C  4   N  −3    1.442    0.37     a   ?
C  9   Se −2    1.97     0.37     b   ?
C  9   I  −1    2.12     0.37     b   ?
C  9   Br −1    1.90     0.37     b   ?
C  9   S  −2    1.82     0.37     b   ?
C  9   Te −2    2.21     0.37     b   ?
C  9   N  −3    1.47     0.37     b   ?
C  9   P  −3    1.89     0.37     b   ?
C  9   As −3    1.99     0.37     b   ?
C  9   H  −1    1.10     0.37     b   ?
Ca 2   O  −2    1.967    0.37     a   ?
Ca 2   O  −2    1.896    0.41     o   ?
Ca 2   S  −2    2.45     0.37     b   ?
Ca 2   Se −2    2.56     0.37     b   ?
Ca 2   Te −2    2.76     0.37     b   ?
Ca 2   F  −1    1.842    0.37     a   ?
Ca 2   Cl −1    2.37     0.37     b   ?
Ca 2   Br −1    2.507    0.37     e   unchecked
Ca 2   Br −1    2.49     0.37     b   ?
Ca 2   I  −1    2.72     0.37     b   ?
Ca 2   N  −3    2.14     0.37     b   ?
Ca 2   P  −3    2.55     0.37     b   ?
Ca 2   As −3    2.62     0.37     b   ?
Ca 2   H  −1    1.83     0.37     b   ?
Cd 2   O  −2    1.904    0.37     a   ?
Cd 2   S  −2    2.304    0.37     a   ?
Cd 2   Se −2    2.40     0.37     b   ?
Cd 2   Te −2    2.59     0.37     b   ?
Cd 2   F  −1    1.811    0.37     b   ?
Cd 2   Cl −1    2.212    0.37     a   ?
Cd 2   Cl −1    2.23     0.37     b   ?
Cd 2   Br −1    2.35     0.37     b   ?
Cd 2   I  −1    2.57     0.37     b   ?
Cd 2   I  −1    2.60     0.37     e   unchecked
Cd 2   N  −3    1.96     0.37     b   ?
Cd 2   P  −3    2.34     0.37     b   ?
Cd 2   As −3    2.43     0.37     b   ?
Cd 2   H  −1    1.66     0.37     b   ?
Ce 3   O  −2    2.151    0.37     b   ?
Ce 3   O  −2    2.121    0.37     ab  'in trans-metal complexes'
Ce 3   O  −2    2.116    0.37     ae  'in trans-metal complexes'
Ce 3   S  −2    2.65     0.37     e   unchecked
Ce 3   F  −1    2.036    0.37     b   ?
Ce 3   F  −1    2.00     0.40     p   ?
Ce 3   Cl −1    2.52     0.37     b   ?
Ce 3   Cl −1    2.49     0.40     p   ?
Ce 3   Br −1    2.65     0.35     e   ?
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Ce 3   Br −1    2.65     0.40     p   ?
Ce 3   I  −1    2.87     0.40     p   ?
Ce 4   O  −2    2.028    0.37     b   ?
Ce 4   O  −2    2.068    0.37     ab  'in organic compounds'
Ce 4   S  −2    2.65     0.35     e   unchecked
Ce 4   F  −1    1.995    0.37     b   ?
Ce 4   F  −1    1.97     0.40     p   ?
Ce 9   Cl −1    2.41     0.37     b   ?
Ce 9   Br −1    2.69     0.37     b   ?
Ce 9   I  −1    2.92     0.37     b   ?
Ce 9   S  −2    2.62     0.37     b   ?
Ce 9   Se −2    2.74     0.37     b   ?
Ce 9   Te −2    2.92     0.37     b   ?
Ce 9   N  −3    2.254    0.37     ah  ?
Ce 9   N  −3    2.34     0.37     b   ?
Ce 9   P  −3    2.70     0.37     b   ?
Ce 9   As −3    2.78     0.37     b   ?
Ce 9   H  −1    2.04     0.37     b   ?
Cf 3   O  −2    2.07     0.37     b   ?
Cf 3   F  −1    1.95     0.37     b   ?
Cf 3   F  −1    1.94     0.40     p   ?
Cf 3   Cl −1    2.45     0.37     b   ?
Cf 3   Cl −1    2.41     0.40     p   ?
Cf 3   Br −1    2.55     0.40     p   ?
Cf 4   O  −2    2.06     0.35     p   ?
Cf 4   F  −1    1.92     0.40     p   ?
Cl 3   O  −2    1.71     0.37     e   unchecked
Cl 3   F  −1    1.69     0.37     e   unchecked
Cl 5   O  −2    1.67     0.37     e   unchecked
Cl 7   O  −2    1.632    0.37     a   ?
Cl 7   F  −1    1.55     0.37     b   ?
Cl 7   Cl −1    2.00     0.37     b   ?
Cf 3   Cl −1    2.45     0.37     b   ?
Cm 3   O  −2    2.23     0.37     b   ?
Cm 3   O  −2    2.12     0.35     p   ?
Cm 3   F  −1    2.12     0.37     b   ?
Cm 3   F  −1    1.96     0.40     p   ?
Cm 3   Cl −1    2.62     0.37     b   ?
Cm 3   Cl −1    2.44     0.40     p   ?
Cm 4   O  −2    2.08     0.35     p   ?
Cm 4   F  −1    1.94     0.40     p   ?
Co 1   H  −1    1.000    0.35     e   unchecked
Co 2   O  −2    1.692    0.37     a   ?
Co 2   O  −2    1.685    0.37     i   'from transition metal complexes'
Co 2   S  −2    1.94     0.37     e   unchecked
Co 2   F  −1    1.64     0.37     b   ?
Co 2   Cl −1    2.033    0.37     a   ?
Co 2   Cl −1    2.01     0.37     b   ?
Co 2   N  −3    1.65     0.37     e   unchecked
Co 3   O  −2    1.637    0.37     i   'from transition metal complexes'
Co 3   O  −2    1.70     0.37     b   ?
Co 3   S  −2    2.02     0.37     e   unchecked
Co 3   F  −1    1.62     0.37     b   ?
Co 3   Cl −1    2.05     0.37     b   ?
Co 3   N  −3    1.75     0.37     e   unchecked
Co 3   C   2    1.634    0.37     b   ?
Co 4   O  −2    1.72     0.37     e   unchecked
Co 4   F  −1    1.55     0.37     e   unchecked
Co 9   O  −2    1.655    0.42     o   ?
Co 9   Br −1    2.18     0.37     b   ?
Co 9   I  −1    2.37     0.35     b   ?
Co 9   S  −2    2.06     0.37     b   ?
Co 9   Se −2    2.24     0.37     b   ?
Co 9   Te −2    2.46     0.37     b   ?
Co 9   N  −3    1.84     0.37     b   ?
Co 9   P  −3    2.21     0.37     b   ?
Co 9   As −3    2.28     0.37     b   ?
Co 9   H  −1    1.44     0.37     b   ?
Cr 2   O  −2    1.73     0.37     b   ?
```

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Cr 2   F  -1    1.67     0.37     b   ?
Cr 2   F  -1    1.74     0.37     e   unchecked
Cr 2   Cl -1    2.09     0.37     b   ?
Cr 2   Br -1    2.26     0.37     e   unchecked
Cr 2   I  -1    2.48     0.37     e   unchecked
Cr 2   N  -3    1.83     0.35     e   unchecked
Cr 3   O  -2    1.724    0.37     a   ?
Cr 3   O  -2    1.708    0.37     w   'from transition metal complexes'
Cr 3   S  -2    2.162    0.37     e   unchecked
Cr 3   F  -1    1.657    0.37     a   ?
Cr 3   F  -1    1.64     0.37     b   ?
Cr 3   Cl -1    2.08     0.37     b   ?
Cr 3   Br -1    2.28     0.37     e   unchecked
Cr 3   N  -3    1.81     0.37     e   unchecked
Cr 4   O  -2    1.81     0.37     e   unchecked
Cr 4   F  -1    1.56     0.37     e   unchecked
Cr 5   O  -2    1.76     0.37     w   'from transition metal complexes'
Cr 5   O  -2    1.78     0.37     e   unchecked
Cr 6   O  -2    1.794    0.37     a   ?
Cr 6   F  -1    1.74     0.37     b   ?
Cr 6   Cl -1    2.12     0.37     b   ?
Cr 9   O  -2    1.79     0.34     o   ?
Cr 9   O  -2    1.724    0.37     w   'from transition metal complexes'
Cr 9   Br -1    2.26     0.37     b   ?
Cr 9   I  -1    2.45     0.37     b   ?
Cr 9   S  -2    2.18     0.37     b   ?
Cr 9   Se -2    2.29     0.37     b   ?
Cr 9   Te -2    2.52     0.37     b   ?
Cr 9   N  -3    1.85     0.37     b   ?
Cr 9   P  -3    2.27     0.37     b   ?
Cr 9   As -3    2.34     0.37     b   ?
Cr 9   H  -1    1.52     0.37     b   ?
Cs 1   O  -2    2.417    0.37     a   ?
Cs 1   O  -2    2.2862   0.408    c   '7 A cut-off'
Cs 1   S  -2    2.89     0.37     b   ?
Cs 1   S  -2    2.5253   0.517    c   '7 A cut-off'
Cs 1   S  -2    2.93     0.37     e   unchecked
Cs 1   Se -2    2.98     0.37     b   ?
Cs 1   Se -2    2.6424   0.553    c   '7 A cut-off'
Cs 1   Te -2    3.16     0.37     b   ?
Cs 1   Te -2    2.7647   0.603    c   '8 A cut-off'
Cs 1   F  -1    2.33     0.37     b   ?
Cs 1   F  -1    2.1980   0.410    c   '7 A cut-off'
Cs 1   F  -1    2.38     0.37     e   unchecked
Cs 1   Cl -1    2.791    0.37     a   ?
Cs 1   Cl -1    2.4715   0.495    c   '7 A cut-off'
Cs 1   Br -1    2.95     0.37     b   ?
Cs 1   Br -1    2.5035   0.543    c   '7 A cut-off'
Cs 1   I  -1    3.18     0.37     b   ?
Cs 1   I  -1    2.6926   0.609    c   '8 A cut-off'
Cs 1   I  -1    3.29     0.37     e   unchecked
Cs 1   N  -3    2.83     0.37     e   unchecked
Cs 1   N  -3    2.53     0.37     b   ?
Cs 1   P  -3    2.93     0.37     b   ?
Cs 1   As -3    3.04     0.37     b   ?
Cs 1   H  -1    2.44     0.37     b   ?
Cu 1   O  -2    1.610    0.37     e   unchecked
Cu 1   O  -2    1.504    0.37     l   'from transition metal complexes'
Cu 1   S  -2    1.898    0.37     a   ?
Cu 1   S  -2    1.811    0.37     l   'from transition metal complexes'
Cu 1   Se -2    1.900    0.37     l   'from transition metal complexes'
Cu 1   F  -1    1.6      0.37     b   ?
Cu 1   Cl -1    1.858    0.37     l   'from transition metal complexes'
Cu 1   Cl -1    1.89     0.37     e   unchecked
Cu 1   Br -1    2.03     0.37     e   unchecked
Cu 1   I  -1    2.108    0.37     a   ?
Cu 1   I  -1    2.155    0.37     l   'from transition metal complexes'
Cu 1   N  -3    1.520    0.37     l   '3-coordinate N'
Cu 1   N  -3    1.480    0.37     l   '2-coordinate N'
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Cu 1   N  -3    1.630    0.37     l   '4-coordinate N'
Cu 1   P  -3    1.774    0.37     l   'from transition metal complexes'
Cu 1   As -3    1.856    0.37     l   'from transition metal complexes'
Cu 1   C  -4    1.446    0.37     l   'from transition metal complexes'
Cu 2   O  -2    1.679    0.37     a   ?
Cu 2   O  -2    1.649    0.37     j   'from transition metal complexes'
Cu 2   O  -2    1.655    0.37     l   'from transition metal complexes'
Cu 2   S  -2    2.054    0.37     a   ?
Cu 2   S  -2    2.060    0.37     j   'from transition metal complexes'
Cu 2   S  -2    2.024    0.37     l   'from transition metal complexes'
Cu 2   S  -2    1.86     0.37     b   ?
Cu 2   Se -2    2.02     0.37     b   ?
Cu 2   Se -2    2.124    0.37     l   ?
Cu 2   Te -2    2.27     0.37     b   ?
Cu 2   F  -1    1.594    0.37     a   ?
Cu 2   Cl -1    2.00     0.37     b   ?
Cu 2   Br -1    1.99     0.37     b   ?
Cu 2   Br -1    2.134    0.37     l   'from transition metal complexes'
Cu 2   I  -1    2.16     0.37     b   ?
Cu 2   I  -1    2.36     0.37     l   'from transition metal complexes'
Cu 2   N  -3    1.751    0.37     j   'from transition metal complexes'
Cu 2   N  -3    1.713    0.37     l   'from transition metal complexes'
Cu 2   N  -3    1.61     0.37     b   ?
Cu 2   N  -3    1.709    0.37     l   '2-coordinate N'
Cu 2   N  -3    1.704    0.37     l   '3-coordinate N'
Cu 2   N  -3    1.763    0.37     l   '4-coordinate N'
Cu 2   P  -3    1.97     0.37     b   ?
Cu 2   P  -3    2.05     0.37     l   'from transition metal complexes'
Cu 2   As -3    2.08     0.37     b   ?
Cu 2   C  -4    1.72     0.37     l   'from transition metal complexes'
Cu 2   H  -1    1.21     0.37     b   ?
Cu 3   O  -2    1.735    0.37     t   ?
Cu 3   O  -2    1.739    0.37     e   unchecked
Cu 3   F  -1    1.58     0.37     e   unchecked
Cu 3   Cl -1    2.078    0.37     l   'from transition metal complexes'
Cu 3   N  -3    1.768    0.37     l   'from transition metal complexes'
Cu 3   N  -3    1.753    0.37     t   ?
Cu 3   C  -4    1.84     0.37     l   'from transition metal complexes'
Dy 2   O  -2    1.90     0.37     e   unchecked
Dy 3   O  -2    2.001    0.37     a   ?
Dy 3   O  -2    2.005    0.37     ae  'from transition metal complexes'
Dy 3   F  -1    1.922    0.37     b   ?
Dy 3   F  -1    1.89     0.40     p   ?
Dy 3   Cl -1    2.41     0.37     b   ?
Dy 3   Cl -1    2.38     0.40     p   ?
Dy 3   Br -1    2.53     0.40     p   ?
Dy 3   I  -1    2.76     0.40     p   ?
Dy 9   Br -1    2.56     0.37     b   ?
Dy 9   I  -1    2.77     0.37     b   ?
Dy 9   S  -2    2.47     0.37     b   ?
Dy 9   Se -2    2.61     0.37     b   ?
Dy 9   Te -2    2.80     0.37     b   ?
Dy 9   N  -3    2.124    0.37     ah  ?
Dy 9   N  -3    2.18     0.37     b   ?
Dy 9   P  -3    2.57     0.37     b   ?
Dy 9   As -3    2.64     0.37     b   ?
Dy 9   H  -1    1.89     0.37     b   ?
Er 2   O  -2    1.88     0.37     e   unchecked
Er 2   S  -2    2.52     0.37     e   unchecked
Er 3   O  -2    1.988    0.37     a   ?
Er 3   O  -2    2.010    0.37     b   ?
Er 3   O  -2    1.979    0.37     ae  'from transition metal complexes'
Er 3   S  -2    2.52     0.37     e   unchecked
Er 3   Se -2    2.58     0.37     e   unchecked
Er 3   F  -1    1.904    0.37     a   ?
Er 3   F  -1    1.87     0.40     p   ?
Er 3   Cl -1    2.39     0.37     b   ?
Er 3   Cl -1    2.36     0.40     p   ?
Er 3   Br -1    2.51     0.40     p   ?
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Er 3   I  −1    2.75     0.40     p   ?
Er 9   Br −1    2.54     0.37     b   ?
Er 9   I  −1    2.75     0.37     b   ?
Er 9   S  −2    2.46     0.37     b   ?
Er 9   Se −2    2.59     0.37     b   ?
Er 9   Te −2    2.78     0.37     b   ?
Er 9   N  −3    2.086    0.37     ah  ?
Er 9   N  −3    2.16     0.37     b   ?
Er 9   P  −3    2.55     0.37     b   ?
Er 9   As −3    2.63     0.37     b   ?
Er 9   H  −1    1.86     0.37     b   ?
Es 3   O  −2    2.08     0.35     p   ?
Eu 2   O  −2    2.147    0.37     b   ?
Eu 2   S  −2    2.584    0.37     a   ?
Eu 2   F  −1    2.04     0.37     b   ?
Eu 2   Cl −1    2.53     0.37     b   ?
Eu 2   Br −1    2.67     0.37     e   unchecked
Eu 2   I  −1    2.90     0.37     e   unchecked
Eu 2   N  −3    2.34     0.37     e   unchecked
Eu 3   O  −2    2.074    0.37     a   ?
Eu 3   O  −2    2.038    0.37     ae  'from transition metal complexes'
Eu 3   S  −2    2.58     0.35     e   unchecked
Eu 3   F  −1    1.961    0.37     b   ?
Eu 3   F  −1    1.93     0.40     p   ?
Eu 3   Cl −1    2.48     0.37     e   unchecked
Eu 3   Cl −1    2.42     0.40     p   ?
Eu 3   Br −1    2.57     0.40     p   ?
Eu 3   I  −1    2.79     0.40     p   ?
Eu 9   Br −1    2.61     0.37     b   ?
Eu 9   I  −1    2.83     0.37     b   ?
Eu 9   S  −2    2.53     0.37     b   ?
Eu 9   Se −2    2.66     0.37     b   ?
Eu 9   Te −2    2.85     0.37     b   ?
Eu 9   N  −3    2.161    0.37     ah  ?
Eu 9   N  −3    2.24     0.37     b   ?
Eu 9   P  −3    2.62     0.37     b   ?
Eu 9   As −3    2.70     0.37     b   ?
Eu 9   H  −1    1.95     0.37     b   ?
Fe 2   O  −2    1.734    0.37     a   ?
Fe 2   O  −2    1.713    0.37     h   ?
Fe 2   O  −2    1.700    0.37     j   ?
Fe 2   S  −2    2.12     0.37     e   unchecked
Fe 2   S  −2    2.125    0.37     j   'from transition metal complexes'
Fe 2   F  −1    1.65     0.37     b   ?
Fe 2   Cl −1    2.06     0.37     b   ?
Fe 2   Cl −1    2.15     0.37     e   unchecked
Fe 2   Br −1    2.21     0.35     e   unchecked
Fe 2   I  −1    2.47     0.35     e   ?
Fe 2   N  −3    1.769    0.37     j   'from transition metal complexes'
Fe 3   O  −2    1.759    0.37     a   ?
Fe 3   O  −2    1.751    0.37     h   'from transition metal complexes'
Fe 3   O  −2    1.765    0.37     j   'from transition metal complexes'
Fe 3   S  −2    2.149    0.37     a   ?
Fe 3   S  −2    2.134    0.37     j   ?
Fe 3   F  −1    1.679    0.37     a   ?
Fe 3   Cl −1    2.09     0.37     b   ?
Fe 3   Cl −1    2.15     0.37     e   unchecked
Fe 3   N  −3    1.815    0.37     j   'from transition metal complexes'
Fe 3   C   2    1.689    0.37     a   ?
Fe 4   S  −2    2.23     0.35     e   unchecked
Fe 6   O  −2    1.76     0.35     e   unchecked
Fe 9   O  −2    1.795    0.30     ag  'for all oxidation states'
Fe 9   O  −2    1.74     0.38     o   ?
Fe 9   Br −1    2.26     0.37     b   ?
Fe 9   I  −1    2.47     0.37     b   ?
Fe 9   S  −2    2.16     0.37     b   ?
Fe 9   Se −2    2.28     0.37     b   ?
Fe 9   Te −2    2.53     0.37     b   ?
Fe 9   N  −3    1.86     0.37     b   ?
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Fe 9   P  −3    2.27     0.37     b   ?
Fe 9   As −3    2.35     0.37     b   ?
Fe 9   H  −1    1.53     0.37     b   ?
Ga 1   Se −1    2.55     0.37     e   unchecked
Ga 3   O  −2    1.730    0.37     a   ?
Ga 3   S  −2    2.163    0.37     a   ?
Ga 3   F  −1    1.62     0.37     b   ?
Ga 3   F  −1    1.69     0.37     e   unchecked
Ga 3   Cl −1    2.07     0.37     b   ?
Ga 3   Br −1    2.20     0.35     e   ?
Ga 3   I  −1    2.46     0.37     e   unchecked
Ga 9   Br −1    2.24     0.37     b   ?
Ga 9   I  −1    2.45     0.37     b   ?
Ga 9   S  −2    2.17     0.37     b   ?
Ga 9   Se −2    2.30     0.37     b   ?
Ga 9   Te −2    2.54     0.37     b   ?
Ga 9   N  −3    1.84     0.37     b   ?
Ga 9   P  −3    2.26     0.37     b   ?
Ga 9   As −3    2.34     0.37     b   ?
Ga 9   H  −1    1.51     0.37     b   ?
Gd 2   O  −2    2.01     0.37     e   unchecked
Gd 2   F  −1    2.40     0.37     e   unchecked
Gd 3   O  −2    2.065    0.37     b   ?
Gd 3   O  −2    2.031    0.37     ae  'from transition metal complexes'
Gd 3   S  −2    2.53     0.37     e   unchecked
Gd 3   F  −1    1.95     0.37     b   ?
Gd 3   F  −1    1.92     0.40     p   ?
Gd 3   Cl −1    2.445    0.37     b   ?
Gd 3   Cl −1    2.41     0.40     p   ?
Gd 3   Cl −1    2.47     0.37     e   unchecked
Gd 3   Br −1    2.56     0.40     p   ?
Gd 3   I  −1    2.78     0.40     p   ?
Gd 9   Br −1    2.60     0.37     b   ?
Gd 9   I  −1    2.82     0.37     b   ?
Gd 9   S  −2    2.53     0.37     b   ?
Gd 9   Se −2    2.65     0.37     b   ?
Gd 9   Te −2    2.84     0.37     b   ?
Gd 9   N  −3    2.146    0.37     ah  ?
Gd 9   N  −3    2.22     0.37     b   ?
Gd 9   N  −3    2.10     0.37     e   ?
Gd 9   P  −3    2.61     0.37     b   ?
Gd 9   As −3    2.68     0.37     b   ?
Gd 9   H  −1    1.93     0.37     b   ?
Ge 4   O  −2    1.748    0.37     a   ?
Ge 4   S  −2    2.217    0.37     a   ?
Ge 4   Se −2    2.35     0.37     e   unchecked
Ge 4   F  −1    1.66     0.37     b   ?
Ge 4   Cl −1    2.14     0.37     b   ?
Ge 9   Br −1    2.30     0.37     b   ?
Ge 9   I  −1    2.50     0.37     b   ?
Ge 9   S  −2    2.23     0.37     b   ?
Ge 9   Se −2    2.35     0.37     b   ?
Ge 9   Te −2    2.56     0.37     b   ?
Ge 9   N  −3    1.88     0.37     b   ?
Ge 9   P  −3    2.32     0.37     b   ?
Ge 9   As −3    2.43     0.37     b   ?
Ge 9   H  −1    1.55     0.37     b   ?
H  1   O  −2    0.569    0.94     e   '1.05<O−H<1.70 A, best general value'
H  1   O  −2    0.907    0.28     e   'O−H < 1.05 A'
H  1   O  −2    0.990    0.59     e   '1.70 A < O−H'
Hf 3   F  −1    2.62     0.37     e   unchecked
Hf 4   O  −2    1.923    0.37     b   ?
Hf 4   F  −1    1.85     0.37     b   ?
Hf 4   F  −1    1.82     0.40     p   ?
Hf 4   Cl −1    2.24     0.37     e   unchecked
Hf 4   Cl −1    2.30     0.37     b   ?
Hf 9   Br −1    2.47     0.37     b   ?
Hf 9   S  −2    2.39     0.37     b   ?
Hf 9   Se −2    2.52     0.37     b   ?
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Hf 9	Te −2	2.72	0.37	b	?
Hf 9	I −1	2.68	0.37	b	?
Hf 9	N −3	2.09	0.37	b	?
Hf 9	P −3	2.48	0.37	b	?
Hf 9	As −3	2.56	0.37	b	?
Hf 9	H −1	1.78	0.37	b	?
Hg 1	O −2	1.90	0.37	b	?
Hg 1	F −1	1.81	0.37	b	?
Hg 1	Cl −1	2.28	0.37	b	?
Hg 2	O −2	1.972	0.37	a	?
Hg 2	O −2	1.93	0.37	b	?
Hg 2	S −2	2.308	0.37	a	?
Hg 2	F −1	2.17	0.37	e	unchecked
Hg 2	F −1	1.90	0.37	b	?
Hg 2	Cl −1	2.28	0.37	e	?
Hg 2	Cl −1	2.25	0.37	b	?
Hg 2	Br −1	2.38	0.37	e	unchecked
Hg 2	I −1	2.62	0.37	e	unchecked
Hg 9	Br −1	2.40	0.37	b	?
Hg 9	I −1	2.59	0.37	b	?
Hg 9	S −2	2.32	0.37	b	?
Hg 9	Se −2	2.47	0.37	b	?
Hg 9	Te −2	2.61	0.37	b	?
Hg 9	N −3	2.02	0.37	b	?
Hg 9	P −3	2.42	0.37	b	?
Hg 9	As −3	2.50	0.37	b	?
Hg 9	H −1	1.71	0.37	b	?
Hg 2	Hg 2	2.51	0.35	f	?
Ho 3	O −2	2.025	0.37	a	?
Ho 3	O −2	1.992	0.37	ae	'from transition metal complexes'
Ho 3	S −2	2.49	0.37	e	unchecked
Ho 3	F −1	1.908	0.37	b	?
Ho 3	F −1	1.88	0.40	p	?
Ho 3	Cl −1	2.401	0.37	b	?
Ho 3	Cl −1	2.37	0.40	p	?
Ho 3	Br −1	2.52	0.40	p	?
Ho 3	I −1	2.76	0.40	p	?
Ho 9	Br −1	2.55	0.37	b	?
Ho 9	I −1	2.77	0.37	b	?
Ho 9	S −2	2.48	0.37	b	?
Ho 9	Se −2	2.61	0.37	b	?
Ho 9	Te −2	2.80	0.37	b	?
Ho 9	N −3	2.118	0.37	ah	?
Ho 9	N −3	2.18	0.37	b	?
Ho 9	P −3	2.56	0.37	b	?
Ho 9	As −3	2.64	0.37	b	?
Ho 9	H −1	1.88	0.37	b	?
I 0	I 0	2.195	0.35	e	unchecked
I 1	F −1	2.32	0.37	e	unchecked
I 1	Cl −1	2.47	0.37	e	unchecked
I 3	O −2	2.02	0.37	e	unchecked
I 3	F −1	1.90	0.37	b	?
I 3	Cl −1	2.39	0.37	e	unchecked
I 5	O −2	2.003	0.37	a	?
I 5	F −1	1.84	0.37	e	unchecked
I 5	F −1	1.90	0.37	b	?
I 5	Cl −1	2.38	0.37	b	?
I 7	O −2	1.93	0.37	b	?
I 7	F −1	1.83	0.37	b	?
I 7	Cl −1	2.31	0.37	b	?
In 1	Cl −1	2.56	0.37	e	unchecked
In 3	O −2	1.902	0.37	a	?
In 3	S −2	2.370	0.37	a	?
In 3	F −1	1.792	0.37	a	?
In 3	Cl −1	2.28	0.37	b	?
In 3	Br −1	2.51	0.35	e	unchecked
In 3	I −1	2.63	0.37	e	unchecked
In 3	Co −1	2.593	0.35	e	unchecked
In 3	Mn −2	2.604	0.35	e	unchecked

In 9	Br −1	2.41	0.37	b	?
In 9	I −1	2.63	0.37	b	?
In 9	S −2	2.36	0.37	b	?
In 9	Se −2	2.47	0.37	b	?
In 9	Te −2	2.69	0.37	b	?
In 9	N −3	2.03	0.37	b	?
In 9	P −3	2.43	0.37	b	?
In 9	As −3	2.51	0.37	b	?
In 9	H −1	1.72	0.37	b	?
Ir 4	O −2	1.87	0.37	e	unchecked
Ir 4	F −1	1.80	0.37	e	unchecked
Ir 5	O −2	1.916	0.37	b	?
Ir 5	O −2	2.01	0.37	e	unchecked
Ir 5	F −1	1.82	0.37	b	?
Ir 5	Cl −1	2.30	0.37	b	?
Ir 9	S −2	2.38	0.37	b	?
Ir 9	Se −2	2.51	0.37	b	?
Ir 9	Te −2	2.71	0.37	b	?
Ir 9	Br −1	2.45	0.37	b	?
Ir 9	I −1	2.66	0.37	b	?
Ir 9	N −3	2.06	0.37	b	?
Ir 9	P −3	2.46	0.37	b	?
Ir 9	As −3	2.54	0.37	b	?
Ir 9	H −1	1.76	0.37	b	?
K 1	O −2	2.132	0.37	a	?
K 1	O −2	2.113	0.37	u	?
K 1	O −2	1.9548	0.430	c	'6 A cut-off'
K 1	O −2	1.84	0.48	o	?
K 1	S −2	2.59	0.37	b	?
K 1	S −2	2.1516	0.580	c	'7 A cut-off'
K 1	S −2	2.63	0.37	e	unchecked
K 1	Se −2	2.72	0.37	b	?
K 1	Se −2	2.2811	0.612	c	'7 A cut-off'
K 1	Te −2	2.93	0.37	b	?
K 1	Te −2	2.4102	0.653	c	'7 A cut-off'
K 1	F −1	1.992	0.37	a	?
K 1	F −1	1.8307	0.429	c	'6 A cut-off'
K 1	Cl −1	2.519	0.37	a	?
K 1	Cl −1	2.0707	0.559	c	'6 A cut-off'
K 1	Br −1	2.66	0.37	b	?
K 1	Br −1	2.1529	0.603	c	'7 A cut-off'
K 1	I −1	2.88	0.37	b	?
K 1	I −1	2.2821	0.658	c	'7 A cut-off'
K 1	I −1	2.92	0.37	e	unchecked
K 1	N −3	2.26	0.37	b	?
K 1	N −3	2.30	0.37	e	unchecked
K 1	P −3	2.64	0.37	b	?
K 1	As −3	2.83	0.37	b	?
K 1	H −1	2.10	0.37	b	?
Kr 2	F −1	1.88	0.37	e	?
La 3	O −2	2.172	0.37	a	?
La 3	O −2	2.172	0.33	ac	?
La 3	O −2	2.148	0.37	ae	'from transition metal complexes'
La 3	S −2	2.643	0.37	a	?
La 3	Se −2	2.74	0.37	b	?
La 3	Te −2	2.94	0.37	b	?
La 3	F −1	2.02	0.40	p	?
La 3	F −1	2.08	0.37	e	unchecked
La 3	Cl −1	2.545	0.37	b	?
La 3	Cl −1	2.57	0.37	e	unchecked
La 3	Cl −1	2.58	0.40	p	?
La 3	Br −1	2.72	0.37	b	?
La 3	Br −1	2.66	0.40	p	?
La 3	I −1	2.93	0.37	b	?
La 3	I −1	2.88	0.40	p	?
La 3	N −3	2.261	0.37	ah	?
La 3	N −3	2.34	0.37	b	?
La 3	P −3	2.73	0.37	b	?
La 3	As −3	2.80	0.37	b	?

La	3	H	−1	2.06	0.37	b ?
Li	1	O	−2	1.466	0.37	a ?
Li	1	O	−2	1.1745	0.514	c ’6 A cut−off’
Li	1	O	−2	1.29	0.48	o ?
Li	1	S	−2	1.94	0.37	b ?
Li	1	S	−2	1.4607	0.656	c ’6 A cut−off’
Li	1	Se	−2	2.09	0.37	b ?
Li	1	Se	−2	1.6272	0.681	c ’7 A cut−off’
Li	1	Te	−2	2.30	0.37	b ?
Li	1	Te	−2	1.7340	0.717	c ’7 A cut−off’
Li	1	F	−1	1.360	0.37	a ?
Li	1	F	−1	1.0968	0.503	c ’6 A cut−off’
Li	1	Cl	−1	1.91	0.37	b ?
Li	1	Cl	−1	1.3873	0.640	c ’6 A cut−off’
Li	1	Cl	−1	1.94	0.37	e unchecked
Li	1	Br	−1	2.02	0.37	b ?
Li	1	Br	−1	1.5150	0.674	c ’7 A cut−off’
Li	1	I	−1	2.22	0.37	b ?
Li	1	I	−1	1.6754	0.722	c ’7 A cut−off’
Li	1	N	−3	1.61	0.37	b ?
Lu	3	O	−2	1.971	0.37	b ?
Lu	3	O	−2	1.947	0.37	ae ’from transition metal complex’
Lu	3	S	−2	2.43	0.37	b ?
Lu	3	Se	−2	2.56	0.37	b ?
Lu	3	Te	−2	2.75	0.37	b ?
Lu	3	F	−1	1.876	0.37	b ?
Lu	3	F	−1	1.84	0.40	p ?
Lu	3	Cl	−1	2.361	0.37	b ?
Lu	3	Cl	−1	2.33	0.40	p ?
Lu	3	Br	−1	2.50	0.37	b ?
Lu	3	Br	−1	2.48	0.40	p ?
Lu	3	I	−1	2.73	0.37	b ?
Lu	3	I	−1	2.73	0.40	p ?
Lu	3	N	−3	2.046	0.37	ah ?
Lu	3	N	−3	2.11	0.37	b ?
Lu	3	P	−3	2.51	0.37	b ?
Lu	3	As	−3	2.59	0.37	b ?
Lu	3	H	−1	1.82	0.37	b ?
Mg	2	O	−2	1.693	0.37	a ?
Mg	2	O	−2	1.636	0.42	o ?
Mg	2	S	−2	2.18	0.37	b ?
Mg	2	Se	−2	2.32	0.37	b ?
Mg	2	Te	−2	2.53	0.37	b ?
Mg	2	F	−1	1.578	0.37	a ?
Mg	2	Cl	−1	2.08	0.37	b ?
Mg	2	Br	−1	2.28	0.37	b ?
Mg	2	I	−1	2.46	0.37	b ?
Mg	2	N	−3	1.85	0.37	b ?
Mg	2	P	−3	2.29	0.37	b ?
Mg	2	As	−3	2.38	0.37	b ?
Mg	2	H	−1	1.53	0.37	b ?
Mn	2	O	−2	1.790	0.37	a ?
Mn	2	O	−2	1.765	0.37	j ?
Mn	2	S	−2	2.22	0.37	e unchecked
Mn	2	F	−1	1.698	0.37	a ?
Mn	2	Cl	−1	2.133	0.37	a ?
Mn	2	Br	−1	2.34	0.37	e unchecked
Mn	2	I	−2	2.52	0.37	e unchecked
Mn	2	N	−3	1.849	0.37	j ’from transition metal complexes’
Mn	2	N	−3	1.65	0.35	e unchecked
Mn	3	O	−2	1.760	0.37	a ?
Mn	3	O	−2	1.732	0.37	j ’from transition metal complexes’
Mn	3	F	−1	1.66	0.37	b ?
Mn	3	Cl	−1	2.14	0.37	b ?
Mn	3	N	−3	1.837	0.37	j ’from transition metal complexes’
Mn	4	O	−2	1.753	0.37	a ?
Mn	4	O	−2	1.750	0.37	j ’from transition metal complexes’
Mn	4	F	−1	1.71	0.37	b ?
Mn	4	F	−1	1.63	0.37	e unchecked

Mn	4	Cl	−1	2.13	0.37	b ?
Mn	4	N	−3	1.822	0.37	j ’from transition metal complexes’
Mn	6	O	−2	1.79	0.37	e ?
Mn	7	O	−2	1.827	0.37	e unchecked
Mn	7	O	−2	1.79	0.37	b ?
Mn	7	F	−1	1.72	0.37	b ?
Mn	7	Cl	−1	2.17	0.37	b ?
Mn	9	O	−2	1.754	0.37	g ’from transition metal complexes’
Mn	9	Br	−1	2.26	0.37	b ?
Mn	9	I	−1	2.49	0.37	b ?
Mn	9	S	−2	2.20	0.37	b ?
Mn	9	Se	−1	2.32	0.37	b ?
Mn	9	Te	−2	2.55	0.37	b ?
Mn	9	N	−3	1.87	0.37	b ?
Mn	9	P	−3	2.24	0.37	b ?
Mn	9	As	−3	2.36	0.37	b ?
Mn	9	H	−1	1.55	0.37	b ?
Mo	3	O	−2	1.834	0.37	m ?
Mo	3	F	−1	1.76	0.35	e unchecked
Mo	3	Cl	−1	2.22	0.37	e unchecked
Mo	3	Br	−1	2.34	0.37	e unchecked
Mo	3	N	−3	1.96	0.37	e unchecked
Mo	4	O	−2	1.886	0.37	j ’from transition metal complexes’
Mo	4	O	−2	1.856	0.37	m ?
Mo	4	S	−2	2.235	0.37	j ’from transition metal complexes’
Mo	4	F	−1	1.80	0.37	e unchecked
Mo	4	Cl	−1	2.17	0.37	e unchecked
Mo	4	N	−3	2.043	0.37	j ’from transition metal complexes’
Mo	5	O	−2	1.907	0.37	j ’from transition metal complexes’
Mo	5	O	−2	1.878	0.37	m ?
Mo	5	S	−2	2.288	0.37	j ’from transition metal complexes’
Mo	5	Cl	−1	2.26	0.37	e unchecked
Mo	5	N	−3	2.009	0.37	j ’from transition metal complexes’
Mo	6	O	−2	1.907	0.37	a ?
Mo	6	O	−2	1.915	0.41	x ?
Mo	6	O	−2	1.87	0.26	n ?
Mo	6	O	−2	1.900	0.37	m ?
Mo	6	S	−2	2.331	0.37	j ’from transition metal complexes’
Mo	6	F	−1	1.81	0.37	b ?
Mo	6	Cl	−1	2.28	0.37	b ?
Mo	6	N	−3	2.009	0.37	j ’from transition metal complexes’
Mo	9	O	−2	1.879	0.30	z ’applies to all oxidation states’
Mo	9	Br	−1	2.43	0.37	b ?
Mo	9	I	−1	2.64	0.37	b ?
Mo	9	S	−2	2.35	0.37	b ?
Mo	9	Se	−2	2.49	0.37	b ?
Mo	9	Te	−2	2.69	0.37	b ?
Mo	9	N	−3	2.04	0.37	b ?
Mo	9	P	−3	2.44	0.37	b ?
Mo	9	As	−3	2.52	0.37	b ?
Mo	9	H	−1	1.73	0.37	b ?
N	3	O	−2	1.361	0.37	a ?
N	3	S	−2	1.73	0.37	e unchecked
N	3	F	−1	1.37	0.37	b ?
N	3	Cl	−1	1.75	0.37	b ?
N	−3	N	−3	1.44	0.35	e unchecked
N	5	O	−2	1.432	0.37	a ?
N	5	O	−2	1.41	0.43	o ?
N	5	F	−1	1.36	0.37	b ?
N	5	Cl	−1	1.80	0.37	b ?
Na	1	O	−2	1.803	0.37	a ?
Na	1	O	−2	1.756	0.37	v ?
Na	1	O	−2	1.5766	0.475	c ’6 A cut−off’
Na	1	O	−2	1.661	0.44	o ?
Na	1	S	−2	2.300	0.37	a ?
Na	1	S	−2	2.28	0.37	b ?
Na	1	S	−2	1.8213	0.626	c ’6 A cut−off’
Na	1	Se	−2	2.41	0.37	b ?
Na	1	Se	−2	1.8908	0.654	c ’7 A cut−off’

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Na 1   Te −2    2.64     0.37     b   ?
Na 1   Te −2    2.0400   0.690    c   ’7 A cut−off’
Na 1   F  −1    1.677    0.37     a   ?
Na 1   F  −1    1.4485   0.465    c   ’6 A cut−off’
Na 1   Cl −1    2.15     0.37     b   ?
Na 1   Cl −1    1.6833   0.608    c   ’6 A cut−off’
Na 1   Cl −1    2.22     0.37     e   unchecked
Na 1   Br −1    2.33     0.37     b   ?
Na 1   Br −1    1.7719   0.646    c   ’7 A cut−off’
Na 1   I  −1    2.56     0.37     b   ?
Na 1   I  −1    1.9555   0.695    c   ’7 A cut−off’
Na 1   N  −3    1.93     0.37     b   ?
Na 1   N  −3    2.01     0.37     e   unchecked
Na 1   P  −3    2.36     0.37     b   ?
Na 1   As −3    2.53     0.37     b   ?
Na 1   H  −1    1.68     0.37     b   ?
Nb 3   O  −2    1.91     0.35     e   unchecked
Nb 3   F  −1    1.71     0.37     e   unchecked
Nb 3   Cl −1    2.20     0.37     e   unchecked
Nb 3   Br −1    2.35     0.37     e   unchecked
Nb 4   O  −2    1.88     0.37     e   unchecked
Nb 4   F  −1    1.90     0.37     e   unchecked
Nb 4   Cl −1    2.26     0.35     e   unchecked
Nb 4   Br −1    2.62     0.37     e   unchecked
Nb 5   O  −2    1.911    0.37     a   ?
Nb 5   O  −2    1.916    0.37     x   ?
Nb 5   F  −1    1.87     0.37     b   ?
Nb 5   Cl −1    2.27     0.37     b   ?
Nb 5   I  −1    2.77     0.37     e   unchecked
Nb 5   N  −3    2.01     0.35     e   unchecked
Nb 9   Br −1    2.45     0.37     b   ?
Nb 9   I  −1    2.68     0.37     b   ?
Nb 9   S  −2    2.37     0.37     b   ?
Nb 9   Se −2    2.51     0.37     b   ?
Nb 9   Te −2    2.70     0.37     b   ?
Nb 9   N  −3    2.06     0.37     b   ?
Nb 9   P  −3    2.46     0.37     b   ?
Nb 9   As −3    2.54     0.37     b   ?
Nb 9   H  −1    1.75     0.37     b   ?
Nd 2   O  −2    1.95     0.37     e   unchecked
Nd 2   S  −2    2.60     0.35     e   unchecked
Nd 3   O  −2    2.105    0.37     a   ?
Nd 3   O  −2    2.117    0.37     b   ?
Nd 3   O  −2    2.086    0.37     ae  ’from transition metal complexes’
Nd 3   S  −2    2.59     0.37     b   ?
Nd 3   Se −2    2.71     0.37     b   ?
Nd 3   Te −2    2.89     0.37     b   ?
Nd 3   F  −1    2.008    0.37     b   ?
Nd 3   F  −1    1.98     0.40     p   ?
Nd 3   Cl −1    2.492    0.37     b   ?
Nd 3   Cl −1    2.46     0.40     p   ?
Nd 3   Br −1    2.66     0.37     b   ?
Nd 3   Br −1    2.61     0.40     p   ?
Nd 3   I  −1    2.87     0.37     b   ?
Nd 3   I  −1    2.84     0.40     p   ?
Nd 3   N  −3    2.201    0.37     ah  ?
Nd 3   N  −3    2.30     0.37     b   ?
NH 1   O  −2    2.226    0.37     s   ?
NH 1   F  −1    2.129    0.37     s   ?
NH 1   Cl −1    2.619    0.37     s   ?
Ni 2   O  −2    1.654    0.37     a   ?
Ni 2   O  −2    1.670    0.37     j   ’from transition metal complexes’
Ni 2   S  −2    1.98     0.37     e   unchecked
Ni 2   S  −2    1.937    0.37     j   ’from transition metal complexes’
Ni 2   F  −1    1.596    0.37     a   ?
Ni 2   Cl −1    2.02     0.37     b   ?
Ni 2   Br −1    2.20     0.37     e   unchecked
Ni 2   I  −1    2.40     0.37     e   unchecked
Ni 2   N  −3    1.70     0.37     e   unchecked
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Ni 2   N  −3    1.647    0.37     j   ’from transition metal complexes’
Ni 3   O  −2    1.75     0.37     e   ?
Ni 3   S  −2    2.040    0.37     j   ’from transition metal complexes’
Ni 3   F  −1    1.58     0.37     e   unchecked
Ni 3   N  −3    1.731    0.37     j   ’from transition metal complexes’
Ni 4   O  −2    1.78     0.35     e   unchecked
Ni 4   F  −1    1.61     0.37     e   unchecked
Ni 9   Br −1    2.16     0.37     b   ?
Ni 9   I  −1    2.34     0.37     b   ?
Ni 9   S  −2    2.04     0.37     b   ?
Ni 9   Se −2    2.14     0.37     b   ?
Ni 9   Te −2    2.43     0.37     b   ?
Ni 9   N  −3    1.75     0.37     b   ?
Ni 9   P  −3    2.17     0.37     b   ?
Ni 9   As −3    2.24     0.37     b   ?
Ni 9   H  −1    1.40     0.37     b   ?
Np 3   F  −1    2.00     0.40     p   ?
Np 3   Cl −1    2.48     0.40     p   ?
Np 3   Br −1    2.62     0.40     p   ?
Np 3   I  −1    2.85     0.40     p   ?
Np 4   O  −2    2.18     0.37     e   unchecked
Np 4   O  −2    2.11     0.35     p   ?
Np 4   F  −1    2.02     0.37     e   unchecked
Np 4   F  −1    1.98     0.40     p   ?
Np 4   Cl −1    2.46     0.40     p   ?
Np 5   O  −2    2.09     0.35     p   ?
Np 5   F  −1    1.97     0.40     p   ?
Np 5   Cl −1    2.42     0.40     p   ?
Np 6   O  −2    2.07     0.35     p   ?
Np 6   F  −1    1.97     0.40     p   ?
Np 7   O  −2    2.06     0.35     p   ?
O −2   O  −2    1.500    0.35     e   unchecked
Os 4   O  −2    1.811    0.37     b   ?
Os 4   S  −2    2.21     0.37     e   unchecked
Os 4   F  −1    1.72     0.37     b   ?
Os 4   Cl −1    2.19     0.37     b   ?
Os 4   Br −1    2.37     0.37     e   unchecked
Os 5   F  −1    1.81     0.37     e   unchecked
Os 6   O  −2    2.03     0.37     a   ?
Os 6   F  −1    1.80     0.35     e   unchecked
Os 8   O  −2    1.92     0.37     e   unchecked
P  3   O  −2    1.63     0.37     e   unchecked
P  3   S  −2    2.12     0.37     e   unchecked
P  3   Se −2    2.24     0.37     e   unchecked
P  3   F  −1    1.53     0.35     e   unchecked
P  4   O  −2    1.64     0.37     e   unchecked
P  4   S  −2    2.13     0.35     e   unchecked
P  4   F  −1    1.66     0.37     e   unchecked
P  5   O  −2    1.617    0.37     a   ?
P  5   O  −2    1.604    0.37     b   ?
P  5   S  −2    2.145    0.37     a   ?
P  5   F  −1    1.54     0.37     e   unchecked
P  5   Cl −1    2.02     0.37     e   ?
P  5   Br −1    2.17     0.40     e   unchecked
P  5   N  −3    1.704    0.37     a   ?
P  9   Br −1    2.15     0.37     b   ?
P  9   I  −1    2.40     0.37     b   ?
P  9   S  −2    2.11     0.37     b   ?
P  9   Se −2    2.26     0.37     b   ?
P  9   Te −2    2.44     0.37     b   ?
P  9   N  −3    1.73     0.37     b   ?
P  9   P  −3    2.19     0.37     b   ?
P  9   As −3    2.25     0.37     b   ?
P  9   H  −1    1.41     0.37     b   ?
P  5   P   5    2.22     0.35     e   unchecked
Pa 4   O  −2    2.15     0.35     p   ?
Pa 4   F  −1    2.02     0.40     p   ?
Pa 4   Cl −1    2.49     0.40     p   ?
Pa 4   Br −1    2.66     0.40     p   ?
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Pa 5   O  −2    2.09     0.35     e   unchecked
Pa 5   O  −2    2.11     0.35     p   ?
Pa 5   F  −1    2.04     0.37     e   unchecked
Pa 5   F  −1    2.01     0.40     p   ?
Pa 5   Cl −1    2.45     0.40     p   ?
Pa 5   Br −1    2.58     0.40     p   ?
Pb 2   O  −2    1.963    0.49     q   ?
Pb 2   O  −2    2.112    0.37     a   ?
Pb 2   S  −2    2.541    0.37     a   ?
Pb 2   Se −2    2.69     0.37     e   unchecked
Pb 2   F  −1    2.03     0.37     b   ?
Pb 2   Cl −1    2.53     0.37     b   ?
Pb 2   Br −1    2.68     0.37     e   unchecked
Pb 2   I  −1    2.83     0.37     e   unchecked
Pb 2   N  −3    2.18     0.40     e   unchecked
Pb 4   O  −2    2.042    0.37     a   ?
Pb 4   F  −1    1.94     0.37     b   ?
Pb 4   Cl −1    2.43     0.37     b   ?
Pb 4   Cl −1    2.36     0.37     e   unchecked
Pb 4   Br −1    3.04     0.35     e   unchecked
Pb 9   Br −1    2.64     0.37     b   ?
Pb 9   I  −1    2.78     0.37     b   ?
Pb 9   S  −2    2.55     0.37     b   ?
Pb 9   Se −2    2.67     0.37     b   ?
Pb 9   Te −2    2.84     0.37     b   ?
Pb 9   N  −3    2.22     0.37     b   ?
Pb 9   P  −3    2.64     0.37     b   ?
Pb 9   As −3    2.72     0.37     b   ?
Pb 9   H  −1    1.97     0.37     b   ?
Pd 2   O  −2    1.792    0.37     b   ?
Pd 2   S  −2    2.09     0.37     e   unchecked
Pd 2   F  −1    1.74     0.37     b   ?
Pd 2   Cl −1    2.05     0.37     b   ?
Pd 2   Br −1    2.20     0.37     e   unchecked
Pd 2   I  −1    2.36     0.37     e   unchecked
Pd 2   N  −3    1.82     0.35     e   unchecked
Pd 2   C  −4    1.73     0.37     e   unchecked
Pd 4   S  −2    2.30     0.37     e   unchecked
Pd 4   F  −1    1.66     0.37     e   unchecked
Pd 9   Br −1    2.19     0.37     b   ?
Pd 9   I  −1    2.38     0.37     b   ?
Pd 9   S  −2    2.10     0.37     b   ?
Pd 9   Se −2    2.22     0.37     b   ?
Pd 9   Te −2    2.48     0.37     b   ?
Pd 9   N  −3    1.81     0.37     b   ?
Pd 9   P  −3    2.22     0.37     b   ?
Pd 9   As −3    2.30     0.37     b   ?
Pd 9   H  −1    1.47     0.37     b   ?
Pm 3   F  −1    1.96     0.40     p   ?
Pm 3   Cl −1    2.45     0.40     p   ?
Pm 3   Br −1    2.59     0.40     p   ?
Pm 3   Cl −1    2.82     0.40     p   ?
Po 4   O  −2    2.19     0.37     e   unchecked
Po 4   F  −1    2.38     0.37     e   unchecked
Pr 3   O  −2    2.138    0.37     a   ?
Pr 3   O  −2    2.098    0.37     ae  'from transition metal complexes'
Pr 3   S  −2    2.60     0.37     b   ?
Pr 3   Se −1    2.72     0.37     b   ?
Pr 3   Te −2    2.90     0.37     b   ?
Pr 3   F  −1    2.022    0.37     b   ?
Pr 3   F  −1    1.99     0.40     p   ?
Pr 3   Cl −1    2.50     0.37     b   ?
Pr 3   Cl −1    2.47     0.40     p   ?
Pr 3   Br −1    2.67     0.37     b   ?
Pr 3   Br −1    2.63     0.40     p   ?
Pr 3   I  −1    2.89     0.37     b   ?
Pr 3   I  −1    2.85     0.40     p   ?
Pr 3   N  −3    2.215    0.37     ah  ?
Pr 3   N  −3    2.30     0.37     b   ?
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Pr 3   P  −3    2.68     0.37     b   ?
Pr 3   As −3    2.75     0.37     b   ?
Pr 3   H  −1    2.02     0.37     b   ?
Pt 2   O  −2    1.768    0.37     b   ?
Pt 2   O  −2    1.80     0.37     e   unchecked
Pt 2   S  −2    2.16     0.37     e   unchecked
Pt 2   F  −1    1.68     0.37     b   ?
Pt 2   Cl −1    2.05     0.37     b   ?
Pt 2   Br −1    2.20     0.37     e   unchecked
Pt 2   C   2    1.760    0.37     a   ?
Pt 2   N  −3    1.81     0.37     e   unchecked
Pt 3   O  −2    1.87     0.37     e   unchecked
Pt 3   Cl −1    2.30     0.37     e   unchecked
Pt 3   Br −1    2.47     0.35     e   unchecked
Pt 4   O  −2    1.879    0.37     a   ?
Pt 4   F  −1    1.759    0.37     b   ?
Pt 4   F  −1    2.19     0.37     e   unchecked
Pt 4   Cl −1    2.17     0.37     b   ?
Pt 4   Cl −1    2.32     0.37     e   unchecked
Pt 4   Br −1    2.6      0.35     e   unchecked
Pt 9   Br −1    2.18     0.37     b   ?
Pt 9   I  −1    2.37     0.37     b   ?
Pt 9   S  −2    2.08     0.37     b   ?
Pt 9   Se −2    2.19     0.37     b   ?
Pt 9   Te −2    2.45     0.37     b   ?
Pt 9   N  −3    1.77     0.37     b   ?
Pt 9   P  −3    2.19     0.37     b   ?
Pt 9   As −3    2.26     0.37     b   ?
Pt 9   H  −1    1.40     0.37     b   ?
Pu 3   O  −2    2.11     0.37     b   ?
Pu 3   O  −2    2.14     0.35     p   ?
Pu 3   F  −1    2.00     0.37     b   ?
Pu 3   F  −1    1.99     0.40     p   ?
Pu 3   Cl −1    2.48     0.37     b   ?
Pu 3   Cl −1    2.46     0.40     p   ?
Pu 3   Br −1    2.60     0.40     p   ?
Pu 3   I  −1    2.84     0.40     p   ?
Pu 4   O  −2    2.09     0.35     p   ?
Pu 4   F  −1    1.97     0.40     p   ?
Pu 4   Cl −1    2.44     0.40     p   ?
Pu 5   O  −2    2.11     0.37     e   ?
Pu 5   O  −2    2.08     0.35     p   ?
Pu 5   F  −1    1.96     0.40     p   ?
Pu 6   O  −2    2.06     0.35     p   ?
Pu 6   F  −1    1.96     0.40     p   ?
Pu 7   O  −2    2.05     0.35     p   ?
Rb 1   O  −2    2.263    0.37     a   ?
Rb 1   O  −2    2.0812   0.415    c   '7 A cut-off'
Rb 1   S  −2    2.70     0.37     b   ?
Rb 1   S  −2    2.2991   0.553    c   '7 A cut-off'
Rb 1   S  −2    2.80     0.37     e   unchecked
Rb 1   Se −2    2.81     0.37     b   ?
Rb 1   Se −2    2.3886   0.587    c   '7 A cut-off'
Rb 1   Te −2    3.00     0.37     b   ?
Rb 1   Te −2    2.4175   0.633    c   '8 A cut-off'
Rb 1   F  −1    2.16     0.37     b   ?
Rb 1   F  −1    1.9718   0.412    c   '6 A cut-off'
Rb 1   F  −1    2.20     0.37     e   unchecked
Rb 1   Cl −1    2.652    0.37     a   ?
Rb 1   Cl −1    2.2653   0.531    c   '7 A cut-off'
Rb 1   Br −1    2.78     0.37     b   ?
Rb 1   Br −1    2.3296   0.578    c   '7 A cut-off'
Rb 1   Br −1    2.86     0.37     e   unchecked
Rb 1   I  −1    3.01     0.37     b   ?
Rb 1   I  −1    2.4509   0.638    c   '7 A cut-off'
Rb 1   I  −1    3.12     0.37     e   unchecked
Rb 1   N  −3    2.62     0.37     e   unchecked
Rb 1   N  −3    2.37     0.37     b   ?
Rb 1   P  −3    2.76     0.37     b   ?
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Rb 1   As -3    2.87     0.37     b   ?
Rb 1   H  -1    2.26     0.37     b   ?
Re 1   Cl -1    2.62     0.35     e   unchecked
Re 3   O  -2    1.9      0.35     e   unchecked
Re 3   Cl -1    2.23     0.37     e   unchecked
Re 4   F  -1    1.81     0.37     e   unchecked
Re 4   Cl -1    2.23     0.37     e   unchecked
Re 4   Br -1    2.35     0.37     e   unchecked
Re 5   O  -2    1.86     0.37     e   ?
Re 5   Cl -1    2.24     0.37     e   unchecked
Re 6   F  -1    1.79     0.37     e   unchecked
Re 7   O  -2    1.97     0.37     e   unchecked
Re 7   F  -1    1.86     0.37     b   ?
Re 7   Cl -1    2.23     0.37     b   ?
Re 9   Br -1    2.45     0.37     b   ?
Re 9   I  -1    2.61     0.37     b   ?
Re 9   S  -2    2.37     0.37     b   ?
Re 9   Se -2    2.50     0.37     b   ?
Re 9   Te -2    2.70     0.37     b   ?
Re 9   N  -3    2.06     0.37     b   ?
Re 9   P  -3    2.46     0.37     b   ?
Re 9   As -3    2.54     0.37     b   ?
Re 9   H  -1    1.75     0.37     b   ?
Rh 3   O  -2    1.793    0.37     b   ?
Rh 3   F  -1    1.71     0.37     b   ?
Rh 3   Cl -1    2.08     0.37     e   unchecked
Rh 3   Cl -1    2.17     0.37     b   ?
Rh 3   Br -1    2.27     0.35     e   unchecked
Rh 3   N  -3    1.82     0.35     e   unchecked
Rh 4   F  -1    1.59     0.37     e   unchecked
Rh 5   F  -1    1.80     0.37     e   unchecked
Rh 9   Br -1    2.25     0.37     b   ?
Rh 9   I  -1    2.48     0.37     b   ?
Rh 9   S  -2    2.15     0.37     b   ?
Rh 9   Se -1    2.33     0.37     b   ?
Rh 9   Te -2    2.55     0.37     b   ?
Rh 9   N  -3    1.88     0.37     b   ?
Rh 9   P  -3    2.29     0.37     b   ?
Rh 9   As -3    2.37     0.37     b   ?
Rh 9   H  -1    1.55     0.37     b   ?
Ru 2   Se -2    2.11     0.35     e   unchecked
Ru 2   F  -1    1.84     0.35     e   unchecked
Ru 3   O  -2    1.77     0.37     o   ?
Ru 3   S  -2    2.20     0.35     e   unchecked
Ru 3   F  -1    2.12     0.37     e   unchecked
Ru 3   Cl -1    2.25     0.37     e   unchecked
Ru 3   N  -3    1.82     0.35     e   unchecked
Ru 4   O  -2    1.834    0.37     b   ?
Ru 4   S  -2    2.21     0.37     e   unchecked
Ru 4   F  -1    1.74     0.37     b   ?
Ru 4   Cl -1    2.21     0.37     b   ?
Ru 5   O  -2    1.90     0.37     o   ?
Ru 5   F  -1    1.82     0.37     e   unchecked
Ru 5   Cl -1    2.23     0.35     e   unchecked
Ru 6   O  -2    1.87     0.35     e   unchecked
Ru 7   O  -2    1.99     0.37     e   unchecked
Ru 9   Br -1    2.26     0.37     b   ?
Ru 9   I  -1    2.48     0.37     b   ?
Ru 9   S  -2    2.16     0.37     b   ?
Ru 9   Se -2    2.33     0.37     b   ?
Ru 9   Te -2    2.54     0.37     b   ?
Ru 9   N  -3    1.88     0.37     b   ?
Ru 9   P  -3    2.29     0.37     b   ?
Ru 9   As -3    2.36     0.37     b   ?
Ru 9   H  -1    1.61     0.37     b   ?
S  2   O  -2    1.74     0.37     e   unchecked
S  2   S  -2    2.03     0.37     e   unchecked
S  2   N  -2    1.597    0.37     a   ?
S  2   N  -3    1.682    0.37     a   ?
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S  2   S   2    2.10     0.35     e   unchecked
S  4   O  -2    1.644    0.37     a   ?
S  4   F  -1    1.60     0.37     b   ?
S  4   Cl -1    2.02     0.37     b   ?
S  4   N  -3    1.762    0.37     a   ?
S  6   O  -2    1.624    0.37     a   ?
S  6   F  -1    1.56     0.37     b   ?
S  6   Cl -1    2.03     0.37     b   ?
S  6   N  -3    1.72     0.37     e   unchecked
S  9   Br -1    2.17     0.37     b   ?
S  9   I  -1    2.36     0.37     b   ?
S  9   S  -2    2.07     0.37     b   ?
S  9   Se -2    2.21     0.37     b   ?
S  9   Te -2    2.45     0.37     b   ?
S  9   N  -3    1.74     0.37     b   ?
S  9   P  -3    2.15     0.37     b   ?
S  9   As -3    2.25     0.37     b   ?
S  9   H  -1    1.38     0.37     b   ?
Sb 3   O  -2    1.973    0.37     a   ?
Sb 3   S  -2    2.474    0.37     a   ?
Sb 3   Se -2    2.60     0.37     e   unchecked
Sb 3   F  -1    1.883    0.37     a   ?
Sb 3   F  -1    1.90     0.37     b   ?
Sb 3   Cl -1    2.35     0.37     b   ?
Sb 3   Br -1    2.51     0.37     e   unchecked
Sb 3   I  -1    2.76     0.37     e   unchecked
Sb 3   N  -3    2.108    0.37     d   ?
Sb 5   O  -2    1.942    0.37     a   ?
Sb 5   F  -1    1.797    0.37     a   ?
Sb 5   Cl -1    2.30     0.37     b   ?
Sb 5   Br -1    2.48     0.37     e   unchecked
Sb 5   N  -3    1.99     0.35     e   unchecked
Sb 9   S  -2    2.45     0.37     b   ?
Sb 9   Se -2    2.57     0.37     b   ?
Sb 9   Te -2    2.78     0.37     b   ?
Sb 9   Br -1    2.50     0.37     b   ?
Sb 9   I  -1    2.72     0.37     b   ?
Sb 9   N  -3    2.12     0.37     b   ?
Sb 9   P  -3    2.52     0.37     b   ?
Sb 9   As -3    2.60     0.37     b   ?
Sb 9   H  -1    2.77     0.37     b   ?
Sc 3   O  -2    1.849    0.37     a   ?
Sc 3   O  -2    1.877    0.35     o   ?
Sc 3   S  -2    2.321    0.37     a   ?
Sc 3   Se -2    2.44     0.37     b   ?
Sc 3   Te -2    2.64     0.37     b   ?
Sc 3   F  -1    1.76     0.37     b   ?
Sc 3   Cl -1    2.36     0.37     e   unchecked
Sc 3   Cl -1    2.23     0.37     b   ?
Sc 3   Br -1    2.38     0.37     b   ?
Sc 3   I  -1    2.59     0.37     b   ?
Sc 3   N  -3    1.98     0.37     b   ?
Sc 3   P  -3    2.40     0.37     b   ?
Sc 3   As -3    2.48     0.37     b   ?
Sc 3   H  -1    1.68     0.37     b   ?
Se 2   S  -2    2.21     0.37     e   unchecked
Se 2   Se -2    2.33     0.37     e   unchecked
Se 4   O  -2    1.811    0.37     a   ?
Se 4   F  -1    1.73     0.37     b   ?
Se 4   Cl -1    2.22     0.37     b   ?
Se 4   Br -1    2.43     0.37     e   unchecked
Se 6   O  -2    1.788    0.37     a   ?
Se 6   F  -1    1.69     0.37     b   ?
Se 6   Cl -1    2.16     0.37     b   ?
Se 6   N  -3    1.90     0.35     e   unchecked
Se 9   Br -1    2.33     0.37     b   ?
Se 9   I  -1    2.54     0.37     b   ?
Se 9   S  -2    2.25     0.37     b   ?
Se 9   Se -2    2.36     0.37     b   ?
```

Se 9	Te −2	2.55	0.37	b	?
Se 9	P −3	2.34	0.37	b	?
Se 9	As −3	2.42	0.37	b	?
Se 9	H −1	1.54	0.37	b	?
Si 4	O −2	1.624	0.37	b	?
Si 4	O −2	1.640	0.37	a	?
Si 4	S −2	2.126	0.37	a	?
Si 4	Se −2	2.26	0.37	b	?
Si 4	Te −2	2.49	0.37	b	?
Si 4	F −1	1.58	0.37	b	?
Si 4	Cl −1	2.03	0.37	b	?
Si 4	Br −1	2.20	0.37	b	?
Si 4	I −1	2.41	0.37	b	?
Si 4	C −4	1.883	0.37	a	?
Si 4	N −3	1.724	0.37	a	?
Si 4	N −3	1.77	0.37	b	?
Si 4	P −3	2.23	0.37	b	?
Si 4	As −3	2.31	0.37	b	?
Si 4	H −1	1.47	0.37	b	?
Sm 2	O −2	2.116	0.37	ai	?
Sm 3	O −2	2.088	0.37	b	?
Sm 3	O −2	2.063	0.37	ae	'from transition metal complexes'
Sm 3	O −2	2.055	0.37	ai	'from transition metal complexes'
Sm 3	S −2	2.55	0.37	b	?
Sm 3	Se −2	2.67	0.37	b	?
Sm 3	Te −2	2.86	0.37	b	?
Sm 3	F −1	1.94	0.40	p	?
Sm 3	F −1	2.00	0.37	e	unchecked
Sm 3	Cl −1	1.977	0.37	b	?
Sm 3	Cl −1	2.43	0.40	p	?
Sm 3	Br −1	2.66	0.37	b	?
Sm 3	Br −1	2.58	0.40	p	?
Sm 3	I −1	2.84	0.37	b	?
Sm 3	I −1	2.80	0.40	p	?
Sm 3	N −3	2.171	0.37	ah	?
Sm 3	N −3	2.24	0.37	b	?
Sm 3	P −3	2.63	0.37	b	?
Sm 3	As −3	2.70	0.37	b	?
Sm 3	H −1	1.96	0.37	b	?
Sn 2	O −2	1.94	0.37	b	?
Sn 2	S −2	2.44	0.37	e	unchecked
Sn 2	F −1	1.925	0.37	a	?
Sn 2	Cl −1	2.41	0.37	e	unchecked
Sn 3	Cl −1	2.36	0.37	b	?
Sn 2	Br −1	2.53	0.35	d	unchecked
Sn 2	I −1	2.81	0.37	e	unchecked
Sn 2	N −3	2.03	0.35	e	unchecked
Sn 4	O −2	1.905	0.37	a	?
Sn 4	S −2	2.399	0.37	a	?
Sn 4	Se −2	2.51	0.37	e	unchecked
Sn 4	F −1	1.843	0.37	a	?
Sn 4	Cl −1	2.276	0.37	a	?
Sn 4	Br −1	2.40	0.37	e	unchecked
Sn 4	N −3	2.03	0.35	e	unchecked
Sn 9	Br −1	2.55	0.37	b	?
Sn 9	I −1	2.76	0.37	b	?
Sn 9	S −2	2.39	0.37	aa	?
Sn 9	S −2	2.45	0.37	b	?
Sn 9	Se −2	2.59	0.37	b	?
Sn 9	Te −2	2.76	0.37	b	?
Sn 9	N −3	2.06	0.37	aa	?
Sn 9	N −3	2.14	0.37	b	?
Sn 9	P −3	2.45	0.37	b	?
Sn 9	As −3	2.62	0.37	b	?
Sn 9	H −1	1.85	0.37	b	?
Sr 2	O −2	2.118	0.37	a	?
Sr 2	S −2	2.59	0.37	b	?
Sr 2	S −2	2.65	0.37	e	unchecked
Sr 2	Se −2	2.72	0.37	b	?

Sr 2	Te −2	2.87	0.37	b	?
Sr 2	Te −2	2.06	0.37	e	unchecked
Sr 2	F −1	2.019	0.37	b	?
Sr 2	Cl −1	2.51	0.37	b	?
Sr 2	Br −1	2.68	0.37	b	?
Sr 2	I −1	2.88	0.37	b	?
Sr 2	N −3	2.23	0.37	b	?
Sr 2	P −3	2.67	0.37	b	?
Sr 2	As −3	2.76	0.37	b	?
Sr 2	H −1	2.01	0.37	b	?
Ta 4	O −2	2.29	0.37	e	unchecked
Ta 5	O −2	1.920	0.37	a	?
Ta 5	S −2	2.47	0.37	e	unchecked
Ta 5	F −1	1.88	0.37	b	?
Ta 5	Cl −1	2.30	0.37	b	?
Ta 9	Br −1	2.45	0.37	b	?
Ta 9	I −1	2.66	0.37	b	?
Ta 9	S −2	2.39	0.37	b	?
Ta 9	Se −2	2.51	0.37	b	?
Ta 9	Te −2	2.70	0.37	b	?
Ta 9	N −3	2.01	0.37	b	?
Ta 9	P −3	2.47	0.37	b	?
Ta 9	As −3	2.55	0.37	b	?
Ta 9	H −1	1.76	0.37	b	?
Tb 3	O −2	2.032	0.37	a	?
Tb 3	O −2	2.049	0.37	b	?
Tb 3	O −2	2.013	0.37	ae	'from transition metal complexes'
Tb 3	S −2	2.51	0.37	b	?
Tb 3	Se −2	2.63	0.37	b	?
Tb 3	Te −2	2.82	0.37	b	?
Tb 3	F −1	1.936	0.37	b	?
Tb 3	F −1	1.90	0.40	p	?
Tb 3	Cl −1	2.427	0.37	b	?
Tb 3	Cl −1	2.39	0.40	p	?
Tb 3	Br −1	2.58	0.37	b	?
Tb 3	Br −1	2.54	0.40	p	?
Tb 3	I −1	2.80	0.37	b	?
Tb 3	I −1	2.77	0.40	p	?
Tb 3	N −3	2.130	0.37	ah	?
Tb 3	N −3	2.20	0.37	b	?
Tb 3	P −3	2.59	0.37	b	?
Tb 3	As −3	2.66	0.37	b	?
Tb 3	H −1	1.91	0.37	b	?
Tc 4	F −1	1.88	0.40	p	?
Tc 4	Cl −1	2.21	0.37	e	unchecked
Tc 7	O −2	1.90	0.37	e	unchecked
Te 4	O −2	1.977	0.37	a	?
Te 4	S −2	2.44	0.37	e	unchecked
Te 4	F −1	1.87	0.37	b	?
Te 4	Cl −1	2.37	0.37	b	?
Te 4	Br −1	2.55	0.37	e	unchecked
Te 4	I −1	2.787	0.37	e	unchecked
Te 6	O −2	1.917	0.37	a	?
Te 6	F −1	1.82	0.37	b	?
Te 6	Cl −1	2.30	0.37	b	?
Te 9	Br −1	2.53	0.37	b	?
Te 9	I −1	2.76	0.37	b	?
Te 9	S −2	2.45	0.37	b	?
Te 9	Se −2	2.53	0.37	b	?
Te 9	Te −2	2.76	0.37	b	?
Te 9	N −3	2.12	0.37	b	?
Te 9	P −3	2.52	0.37	b	?
Te 9	As −3	2.60	0.37	b	?
Te 9	H −1	1.83	0.37	b	?
Th 4	O −2	2.167	0.37	b	?
Th 4	O −2	2.18	0.35	p	?
Th 4	S −2	2.64	0.37	b	?
Th 4	Se −2	2.76	0.37	b	?
Th 4	Te −2	2.94	0.37	b	?

Th	4	F	−1	2.068	0.37	a ?
Th	4	F	−1	2.05	0.40	p ?
Th	4	Cl	−1	2.55	0.37	b ?
Th	4	Cl	−1	2.52	0.40	p ?
Th	4	Br	−1	2.71	0.37	b ?
Th	4	Br	−1	2.68	0.40	p ?
Th	4	I	−1	2.93	0.37	b ?
Th	4	I	−1	2.92	0.40	p ?
Th	4	I	−1	2.96	0.37	e unchecked
Th	4	N	−3	2.34	0.37	b ?
Th	4	P	−3	2.73	0.37	b ?
Th	4	As	−3	2.80	0.37	b ?
Th	4	H	−1	2.07	0.37	b ?
Ti	2	F	−1	2.15	0.37	e unchecked
Ti	2	Cl	−1	2.31	0.37	e unchecked
Ti	2	Br	−1	2.49	0.37	e unchecked
Ti	3	O	−2	1.791	0.37	b ?
Ti	3	S	−2	2.11	0.37	e unchecked
Ti	3	F	−1	1.723	0.37	b ?
Ti	3	Cl	−1	2.22	0.37	e unchecked
Ti	3	Cl	−1	2.17	0.37	b ?
Ti	3	I	−1	2.52	0.37	e unchecked
Ti	4	O	−2	1.815	0.37	a ?
Ti	4	O	−2	1.78	0.43	o ?
Ti	4	S	−2	2.29	0.37	e unchecked
Ti	4	F	−1	1.76	0.37	b ?
Ti	4	Cl	−1	2.19	0.37	b ?
Ti	4	Br	−1	2.36	0.37	e unchecked
Ti	9	O	−2	1.790	0.37	k 'from transition metal complexes'
Ti	9	Cl	−1	2.184	0.37	k 'from transition metal complexes'
Ti	9	Br	−1	2.32	0.37	b ?
Ti	9	I	−1	2.54	0.37	b ?
Ti	9	S	−2	2.24	0.37	b ?
Ti	9	Se	−2	2.38	0.37	b ?
Ti	9	Te	−2	2.60	0.37	b ?
Ti	9	N	−3	1.93	0.37	b ?
Ti	9	N	−3	1.906	0.37	k 'from transition metal complexes'
Ti	9	P	−3	2.36	0.37	b ?
Ti	9	As	−3	2.42	0.37	b ?
Ti	9	H	−1	1.61	0.37	b ?
Tl	1	O	−2	2.124	0.37	a ?
Tl	1	O	−2	2.172	0.37	b ?
Tl	1	O	−2	1.927	0.50	af 'inorganic and organic compounds'
Tl	1	S	−2	2.545	0.37	a ?
Tl	1	F	−1	2.15	0.37	b ?
Tl	1	Cl	−1	2.56	0.37	b ?
Tl	1	Cl	−1	2.61	0.37	e unchecked
Tl	1	Br	−1	2.69	0.37	e unchecked
Tl	1	I	−1	2.822	0.37	a ?
Tl	3	O	−2	2.003	0.37	b ?
Tl	3	F	−1	1.88	0.37	b ?
Tl	3	Cl	−1	2.32	0.37	b ?
Tl	3	Br	−1	2.65	0.35	e unchecked
Tl	9	Br	−1	2.70	0.37	b ?
Tl	9	I	−1	2.91	0.37	b ?
Tl	9	S	−2	2.63	0.37	b ?
Tl	9	Se	−2	2.70	0.37	b ?
Tl	9	Te	−2	2.93	0.37	b ?
Tl	9	N	−3	2.29	0.37	b ?
Tl	9	P	−3	2.71	0.37	b ?
Tl	9	As	−3	2.79	0.37	b ?
Tl	9	H	−1	2.05	0.37	b ?
Tm	3	O	−2	2.000	0.37	b ?
Tm	3	O	−2	1.968	0.37	ae 'from transition metal complexes'
Tm	3	O	−2	1.93	0.37	e unchecked
Tm	3	S	−2	2.45	0.37	b ?
Tm	3	Se	−2	2.58	0.37	b ?
Tm	3	Te	−2	2.77	0.37	b ?
Tm	3	F	−1	1.842	0.37	b ?

Tm	3	F	−1	1.86	0.40	p ?
Tm	3	F	−1	1.91	0.37	e unchecked
Tm	3	Cl	−1	2.38	0.37	b ?
Tm	3	Cl	−1	2.35	0.40	p ?
Tm	3	Br	−1	2.53	0.37	b ?
Tm	3	Br	−1	2.50	0.40	p ?
Tm	3	I	−1	2.74	0.37	b ?
Tm	3	I	−1	2.74	0.40	p ?
Tm	3	N	−3	2.14	0.37	b ?
Tm	3	P	−3	2.53	0.37	b ?
Tm	3	As	−3	2.62	0.37	b ?
Tm	3	H	−1	1.85	0.37	b ?
U	2	O	−1	2.08	0.37	e unchecked
U	3	S	−2	2.54	0.37	e unchecked
U	3	F	−1	2.02	0.40	p ?
U	3	F	−1	2.09	0.37	e unchecked
U	3	Cl	−1	2.49	0.40	p ?
U	3	Br	−1	2.64	0.40	p ?
U	3	I	−1	2.87	0.40	p ?
U	4	O	−2	2.112	0.37	b ?
U	4	O	−2	2.13	0.35	p ?
U	4	S	−2	2.55	0.37	e unchecked
U	4	F	−1	2.038	0.37	a ?
U	4	F	−1	2.034	0.37	b ?
U	4	F	−1	2.00	0.40	p ?
U	4	Cl	−1	2.47	0.40	p ?
U	4	Br	−1	2.60	0.40	p ?
U	4	Br	−1	2.61	0.37	e unchecked
U	4	I	−1	2.88	0.37	e unchecked
U	4	N	−3	2.18	0.37	e unchecked
U	5	O	−2	2.075	0.37	b ?
U	5	O	−2	2.10	0.35	p ?
U	5	F	−1	1.966	0.37	b ?
U	5	F	−1	1.99	0.40	p ?
U	5	Cl	−1	2.46	0.37	b ?
U	5	Cl	−1	2.43	0.40	p ?
U	5	Br	−1	2.7	0.35	e unchecked
U	6	O	−2	2.051	0.519	r ?
U	6	O	−2	2.075	0.37	a ?
U	6	O	−2	2.08	0.35	p ?
U	6	F	−1	1.98	0.40	p ?
U	6	Cl	−1	2.42	0.40	p ?
U	6	N	−3	1.93	0.35	e unchecked
U	9	Br	−1	2.63	0.37	b ?
U	9	I	−1	2.84	0.37	b ?
U	9	S	−2	2.56	0.37	b ?
U	9	Se	−2	2.70	0.37	b ?
U	9	Te	−2	2.86	0.37	b ?
U	9	N	−3	2.24	0.37	b ?
U	9	P	−3	2.64	0.37	b ?
U	9	As	−3	2.72	0.37	b ?
U	9	H	−1	1.97	0.37	b ?
V	1	O	−2	1.88	0.37	e unchecked
V	1	Cl	−1	2.00	0.35	e unchecked
V	2	O	−2	1.70	0.37	e unchecked
V	2	S	−2	2.11	0.37	e unchecked
V	2	F	−1	2.16	0.37	e unchecked
V	2	Cl	−1	2.44	0.37	e unchecked
V	3	O	−2	1.743	0.37	a ?
V	3	O	−2	1.749	0.37	j 'from transition metal complexes'
V	3	S	−2	2.17	0.37	e unchecked
V	3	S	−2	2.185	0.37	j ?
V	3	F	−1	1.702	0.37	b ?
V	3	Cl	−1	2.19	0.37	b ?
V	3	Br	−1	2.33	0.35	e unchecked
V	3	N	−3	1.813	0.37	j 'from transition metal complexes'
V	3	N	−3	1.84	0.35	e unchecked
V	4	O	−2	1.784	0.37	a ?
V	4	O	−2	1.780	0.37	j 'from transition metal complexes'

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V  4   O  −2    1.735    0.37     j   'vanadyl bond only'
V  4   S  −2    2.226    0.37     j   'from transition metal complexes'
V  4   S  −2    2.181    0.37     j   'vanadyl bond only'
V  4   S  −2    2.24     0.37     e   unchecked
V  4   F  −1    1.70     0.37     b   ?
V  4   Cl −1    2.16     0.37     b   ?
V  4   N  −3    1.875    0.37     j   'from transition metal complexes'
V  5   O  −2    1.803    0.37     a   ?
V  5   O  −2    1.799    0.37     x   ?
V  5   S  −2    2.25     0.37     e   unchecked
V  5   F  −1    1.70     0.37     e   unchecked
V  5   Cl −1    2.16     0.37     b   ?
V  9   O  −2    1.788    0.32     ag  'All oxidation states'
V  9   O  −2    1.81     0.34     o   ?
V  9   Br −1    2.30     0.37     b   ?
V  9   I  −1    2.51     0.37     b   ?
V  9   S  −2    2.23     0.37     b   ?
V  9   Se −2    2.33     0.37     b   ?
V  9   Te −2    2.57     0.37     b   ?
V  9   N  −3    1.86     0.37     b   ?
V  9   P  −3    2.31     0.37     b   ?
V  9   As −3    2.39     0.37     b   ?
V  9   H  −1    1.58     0.37     b   ?
W  5   O  −2    1.89     0.37     e   unchecked
W  6   O  −2    1.917    0.37     a   ?
W  6   O  −2    1.916    0.41     x   ?
W  6   O  −2    1.921    0.37     b   ?
W  6   F  −1    1.83     0.37     b   ?
W  6   Cl −1    2.27     0.37     b   ?
W  9   Br −1    2.45     0.37     b   ?
W  9   I  −1    2.66     0.37     b   ?
W  9   S  −2    2.39     0.37     b   ?
W  9   Se −2    2.51     0.37     b   ?
W  9   Te −2    2.71     0.37     b   ?
W  9   N  −3    2.06     0.37     b   ?
W  9   P  −3    2.46     0.37     b   ?
W  9   As −3    2.54     0.37     b   ?
W  9   H  −1    1.76     0.37     b   ?
Xe 2   O  −2    2.05     0.35     e   unchecked
Xe 2   F  −1    2.02     0.37     e   unchecked
Xe 4   F  −1    1.93     0.37     e   unchecked
Xe 6   O  −2    2.00     0.37     e   unchecked
Xe 6   F  −1    1.89     0.37     e   unchecked
Xe 8   O  −2    1.94     0.37     e   unchecked
Y  3   O  −2    2.019    0.37     a   ?
Y  3   O  −2    2.014    0.37     b   ?
Y  3   S  −2    2.48     0.37     b   ?
Y  3   Se −2    2.61     0.37     b   ?
Y  3   Te −2    2.80     0.37     b   ?
Y  3   F  −1    1.904    0.37     b   ?
Y  3   F  −1    1.87     0.37     e   unchecked
Y  3   Cl −1    2.40     0.37     b   ?
Y  3   Br −1    2.55     0.37     b   ?
Y  3   I  −1    2.77     0.37     b   ?
Y  3   N  −3    2.17     0.37     b   ?
Y  3   P  −3    2.57     0.37     b   ?
Y  3   As −3    2.64     0.37     b   ?
Y  3   H  −1    1.86     0.37     b   ?
Yb 3   O  −2    1.965    0.37     a   ?
Yb 3   O  −2    1.985    0.37     b   ?
Yb 3   O  −2    1.954    0.37     ae  'from transition metal complexes'
Yb 3   S  −2    2.43     0.37     b   ?
Yb 3   Se −2    2.56     0.37     b   ?
Yb 3   Te −2    2.76     0.37     b   ?
Yb 3   F  −1    1.875    0.37     b   ?
Yb 3   F  −1    1.85     0.40     p   ?
Yb 3   F  −1    1.90     0.37     e   unchecked
Yb 3   Cl −1    2.371    0.37     b   ?
Yb 3   Cl −1    2.34     0.40     p   ?
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Yb 3   Br −1    2.451    0.37     b   ?
Yb 3   Br −1    2.49     0.40     p   ?
Yb 3   I  −1    2.72     0.37     b   ?
Yb 3   I  −1    2.74     0.40     p   ?
Yb 3   N  −3    2.064    0.37     ah  ?
Yb 3   N  −3    2.12     0.37     b   ?
Yb 3   P  −3    2.53     0.37     b   ?
Yb 3   As −3    2.59     0.37     b   ?
Yb 3   H  −1    1.82     0.37     b   ?
Zn 2   O  −2    1.704    0.37     a   ?
Zn 2   O  −2    1.675    0.39     o   ?
Zn 2   S  −2    2.09     0.37     b   ?
Zn 2   Se −2    2.22     0.37     b   ?
Zn 2   Te −2    2.45     0.37     b   ?
Zn 2   F  −1    1.62     0.37     b   ?
Zn 2   F  −1    1.67     0.37     e   unchecked
Zn 2   Cl −1    2.01     0.37     b   ?
Zn 2   Br −1    2.15     0.37     b   ?
Zn 2   I  −1    2.36     0.37     b   ?
Zn 2   N  −3    1.72     0.37     e   unchecked
Zn 2   P  −3    2.15     0.37     b   ?
Zn 2   As −3    2.24     0.37     b   ?
Zn 2   H  −1    1.42     0.37     b   ?
Zr 2   O  −2    2.34     0.37     e   unchecked
Zr 2   F  −1    2.24     0.37     e   unchecked
Zr 2   Cl −1    2.58     0.37     e   unchecked
Zr 4   O  −2    1.928    0.37     a   ?
Zr 4   O  −2    1.937    0.37     b   ?
Zr 4   S  −2    2.41     0.37     b   ?
Zr 4   Se −2    2.53     0.37     b   ?
Zr 4   Te −2    2.67     0.37     b   ?
Zr 4   F  −1    1.846    0.37     a   ?
Zr 4   F  −1    1.854    0.37     b   ?
Zr 4   Cl −1    2.33     0.37     b   ?
Zr 4   Br −1    2.48     0.37     b   ?
Zr 4   I  −1    2.69     0.37     b   ?
Zr 4   N  −3    2.11     0.37     b   ?
Zr 4   N  −3    2.15     0.37     e   unchecked
Zr 4   P  −3    2.52     0.37     b   ?
Zr 4   As −3    2.57     0.37     b   ?
Zr 4   H  −1    1.79     0.37     b   ?
#### EOF #### EOF #### EOF #### EOF #### EOF #### EOF #### EOF #### EOF ###
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