

Table 1. References for Stout database. Species marked with ‡ are listed in Stout.ini, the default masterlist.

Species	Energy	Transition	Collision
Li ‡	NIST 2013-11-08	NIST 2013-10-18	baseline
Be ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Be ⁺ ‡	NIST 2013-11-08	NIST 2013-10-18	baseline
B ‡	NIST 2013-10-18	NIST 2013-10-18	baseline
B ⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
B ²⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
C ‡	NIST 2013-10-01	NIST 2013-10-01	Johnson et al. (1987) Mendoza (1983) Abrahamsson et al. (2007) Roueff & Le Bourlot (1990) Schroder et al. (1991) Staemmler & Flower (1991)
C ⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	Goldsmith et al. (2012) Wiesenfeld & Goldsmith (2014) Tayal (2008)
C ²⁺ ‡	NIST 2013-11-08 Fernández-Menchero et al. (2014a)	Fernández-Menchero et al. (2014a)	Fernández-Menchero et al. (2014a)
C ³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
N ‡	NIST 2013-12-05	Froese Fischer & Tachiev (2004) NIST 2013-12-05	Tayal (2006)
N ⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
N ²⁺	NIST 2017-10-05	NIST 2017-10-05	baseline
N ³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
N ⁴⁺ ‡	NIST 2013-12-05	NIST 2013-12-05	baseline
O ‡	NIST 2014-01-09	NIST 2014-01-09	Bell et al. (1998) Barklem (2007) Abrahamsson et al. (2007) Krems et al. (2006) Monteiro & Flower (1987) Jaquet et al. (1992) Pequignot (1990) Wang & McConkey (1992)

Table 1. (*Cont.*)

Species	Energy	Transition	Collision
O ⁺ ‡	NIST 2014-01-26	Froese Fischer & Tachiev (2004) NIST 2014-01-26	Kisieliuss et al. (2009)
O ²⁺ ‡	NIST 2014-09-16	NIST Galavis et al. (1997) Storey & Zeippen (2000) Tachiev & Froese Fischer (2001)	Aggarwal (1983) Aggarwal (1985) Bhatia & Kastner (1993) Lennon & Burke (1994) Storey et al. (2014)
O ⁴⁺	NIST 2014-09-16 Fernández-Menchero et al. (2014a)	Fernández-Menchero et al. (2014a)	Fernández-Menchero et al. (2014a)
O ⁵⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
F ⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	Butler & Zeippen (1994)
F ²⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
F ³⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	Lennon & Burke (1994)
F ⁴⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
F ⁵⁺ ‡	NIST 2014-09-16 Fernández-Menchero et al. (2014a)	Fernández-Menchero et al. (2014a)	Fernández-Menchero et al. (2014a)
F ⁶⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Ne ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Ne ⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	Griffin et al. (2001) Hollenbach & McKee (1989)
Ne ²⁺ ‡	NIST McLaughlin et al. (2011)	McLaughlin et al. (2011)	McLaughlin et al. (2011)
Ne ³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ne ⁴⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ne ⁶⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ne ⁷⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Na ‡	NIST 2013-10-01	NIST 2013-10-01	Verner, private communication
Na ⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Na ²⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Na ³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Na ⁴⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Na ⁵⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Na ⁶⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Na ⁷⁺	NIST 2014-09-16	NIST 2014-09-16	baseline

Table 1. (*Cont.*)

Species	Energy	Transition	Collision
Na ⁸⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mg ‡	NIST 2017-10-09	NIST 2017-10-09	Barklem et al. (2012) Osorio et al. (2015)
Mg ⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mg ²⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	Liang & Badnell (2010) NIST 2013-09-07
Mg ³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mg ⁴⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mg ⁵⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mg ⁶⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mg ⁷⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mg ⁸⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mg ⁹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Al ‡	NIST 2017-10-09	NIST 2017-10-09	baseline
Al ⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Al ²⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	Dufton & Kingston (1987)
Al ³⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Al ⁴⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Al ⁵⁺ ‡	NIST 2014-05-24	NIST 2014-05-24	Butler & Zeppen (1994)
Al ⁶⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Al ⁷⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Al ⁸⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Al ⁹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Al ¹⁰⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Si ‡	NIST 2013-10-01	NIST 2013-10-01	Hollenbach & McKee (1989)
Si ⁺ ‡	NIST 2014-08-01 Laha et al. (2016)	Laha et al. (2016)	Aggarwal & Keenan (2014) Barinovs et al. (2005) Laha et al. (2016)
Si ²⁺ ‡	Fernández-Menchero et al. (2014b) NIST	Kwong et al. (1983) Fernández-Menchero et al. (2014b)	Fernández-Menchero et al. (2014b)
Si ³⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	Liang et al. (2009)
Si ⁴⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Si ⁵⁺	NIST 2014-09-16	NIST 2014-09-16	baseline

Table 1. (*Cont.*)

Species	Energy	Transition	Collision
Si ⁶⁺ ‡	NIST 2014-05-24	NIST 2014-05-24	Butler & Zeppen (1994)
Si ⁷⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Si ⁸⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	Lennon & Burke (1994)
Si ⁹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Si ¹⁰⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Si ¹¹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
P ‡	NIST 2013-10-18	NIST 2013-10-18	baseline
P ⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	Tayal (2004)
P ²⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	Krueger & Czyzak (1970)
P ³⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
P ⁴⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
P ⁵⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
P ⁶⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
P ⁷⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
P ⁸⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
P ¹¹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
P ¹²⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
S ‡	NIST 2013-10-01	NIST 2013-10-01	Hollenbach & McKee (1989)
S ⁺ ‡	NIST	Kisieliuss et al. (2014)	Tayal & Zatsarinny (2010)
S ²⁺ ‡		Froese Fischer et al. (2006) Tayal (1997) Podobedova et al. (2009) Heise et al. (1995)	Hudson et al. (2012)
S ³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
S ⁴⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
S ⁵⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
S ⁶⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
S ⁷⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
S ⁸⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
S ⁹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
S ¹⁰⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
S ¹¹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
S ¹²⁺	NIST 2014-09-16	NIST 2014-09-16	baseline

Table 1. (*Cont.*)

Species	Energy	Transition	Collision
S ¹³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cl \ddagger	NIST 2013-10-01	NIST 2013-10-01	Hollenbach & McKee (1989)
Cl ⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cl ²⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cl ³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cl ⁴⁺ \ddagger	NIST 2014-09-16	NIST 2014-09-16	baseline
Cl ⁵⁺ \ddagger	NIST Fernández-Menchero et al. (2014b)	Fernández-Menchero et al. (2014b)	Fernández-Menchero et al. (2014b)
Cl ⁶⁺ \ddagger	Liang et al. (2009)	Liang et al. (2009)	Liang et al. (2009)
Cl ⁷⁺ \ddagger	Liang & Badnell (2010)	Liang & Badnell (2010)	Liang & Badnell (2010)
Cl ⁸⁺ \ddagger	NIST 2013-10-01	NIST 2013-10-01	Berrington et al. (1998)
Cl ⁹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ar \ddagger	NIST 2013-11-08	NIST 2013-10-01	baseline
Ar ⁺ \ddagger	NIST 2013-10-01	NIST 2013-10-01	Pelan & Berrington (1995)
Ar ²⁺ \ddagger	NIST 2013-10-01	NIST 2013-10-01	Galavis et al. (1995)
Ar ³⁺ \ddagger	NIST 2013-10-01	NIST 2013-10-01	Ramsbottom et al. (1997)
Ar ⁴⁺ \ddagger	NIST 2013-10-01	NIST 2013-10-01	Galavis et al. (1995)
Ar ⁵⁺ \ddagger	NIST 2013-10-01	NIST 2013-10-01	Saraph & Storey (1996)
Ar ⁶⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ar ⁷⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ar ⁸⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ar ⁹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ar ¹⁰⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ar ¹²⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ar ¹³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
K \ddagger	NIST 2013-10-01	NIST 2013-10-01	baseline
K ⁺ \ddagger	NIST 2014-09-16	NIST 2014-09-16	baseline
K ²⁺ \ddagger	NIST 2013-10-01	NIST 2013-10-01	Pelan & Berrington (1995)
K ³⁺ \ddagger	NIST 2013-10-01	NIST 2013-10-01	Galavis et al. (1995)
K ⁴⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
K ⁵⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
K ⁶⁺ \ddagger	NIST 2013-10-01	NIST 2013-10-01	Saraph & Storey (1996)

Table 1. (*Cont.*)

Species	Energy	Transition	Collision
$K^{7+} \ddagger$	NIST Fernández-Menclero et al. (2014b)	Fernández-Menclero et al. (2014b)	Fernández-Menclero et al. (2014b)
K^{8+}	NIST 2014-09-16	NIST 2014-09-16	baseline
$K^{9+} \ddagger$	NIST 2014-09-16	NIST 2014-09-16	baseline
K^{10+}	NIST 2014-09-16	NIST 2014-09-16	baseline
K^{11+}	NIST 2014-09-16	NIST 2014-09-16	baseline
K^{12+}	NIST 2014-09-16	NIST 2014-09-16	baseline
K^{13+}	NIST 2014-09-16	NIST 2014-09-16	baseline
K^{14+}	NIST 2014-09-16	NIST 2014-09-16	baseline
K^{15+}	NIST 2014-09-16	NIST 2014-09-16	baseline
K^{16+}	NIST 2017-10-05	NIST 2017-10-05	baseline
$Ca \ddagger$	NIST 2013-10-01	NIST 2013-10-01	baseline
Ca^+	NIST 2014-09-16	NIST 2014-09-16	baseline
$Ca^{2+} \ddagger$	NIST 2014-09-16	NIST 2014-09-16	baseline
$Ca^{3+} \ddagger$	NIST 2013-10-01	NIST 2013-10-01	Pelan & Berrington (1995)
Ca^{4+}	NIST 2014-09-16	NIST 2014-09-16	baseline
$Ca^{5+} \ddagger$	NIST 2014-09-16	NIST 2014-09-16	baseline
Ca^{6+}	NIST 2014-09-16	NIST 2014-09-16	baseline
Ca^{7+}	NIST 2014-09-16	NIST 2014-09-16	baseline
Ca^{9+}	NIST 2014-09-16	NIST 2014-09-16	baseline
Ca^{10+}	NIST 2014-09-16	NIST 2014-09-16	baseline
Ca^{11+}	NIST 2014-09-16	NIST 2014-09-16	baseline
Ca^{12+}	NIST 2014-09-16	NIST 2014-09-16	baseline
Ca^{14+}	NIST 2014-09-16	NIST 2014-09-16	baseline
$Sc \ddagger$	NIST 2013-10-18	NIST 2013-10-18	baseline
$Sc^+ \ddagger$	NIST 2013-10-01	NIST 2013-10-01	Wasson et al. (2011)
$Sc^{2+} \ddagger$	NIST 2013-10-01	NIST 2013-10-01	baseline
$Sc^{3+} \ddagger$	NIST 2014-09-16	NIST 2014-09-16	baseline
$Sc^{4+} \ddagger$	NIST 2013-10-01	NIST 2013-10-01	Pelan & Berrington (1995)
$Sc^{5+} \ddagger$	NIST 2013-10-01	NIST 2013-10-01	baseline
$Sc^{6+} \ddagger$	NIST 2014-09-16	NIST 2014-09-16	baseline
$Sc^{7+} \ddagger$	NIST 2014-09-16	NIST 2014-09-16	baseline
$Sc^{8+} \ddagger$	NIST 2014-09-16	NIST 2014-09-16	baseline

Table 1. (*Cont.*)

Species	Energy	Transition	Collision
Sc ⁹⁺ ‡	NIST Fernández-Menchero et al. (2014b)	Fernández-Menchero et al. (2014b)	Fernández-Menchero et al. (2014b)
Sc ¹⁰⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Sc ¹¹⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Sc ¹²⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	Saraph & Tully (1994)
Sc ¹³⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Sc ¹⁴⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Sc ¹⁵⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Sc ¹⁶⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Sc ¹⁷⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ²⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	baseline
Ti ³⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ⁴⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ⁵⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	Pelan & Berrington (1995)
Ti ⁶⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ⁷⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ⁸⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ⁹⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ¹⁰⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ¹¹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ¹²⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ¹³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ¹⁴⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ¹⁵⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ¹⁶⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ¹⁷⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ¹⁸⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ti ¹⁹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
V ³⁺ ‡	NIST	NIST	baseline
V ⁵⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
V ⁶⁺ ‡	NIST	NIST	Pelan & Berrington (1995)
V ⁷⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
V ⁸⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
V ⁹⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline

Table 1. (*Cont.*)

Species	Energy	Transition	Collision
V ¹⁰⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
V ¹¹⁺ ‡	NIST	Fernández-Mencheró et al. (2014b)	Fernández-Mencheró et al. (2014b)
V ¹²⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
V ¹⁴⁺ ‡	NIST NIST	NIST NIST	Berrington et al. (1998)
V ¹⁵⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
V ¹⁶⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
V ¹⁷⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
V ¹⁸⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
V ¹⁹⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
V ²⁰⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	Grieve & Ramsbottom (2012)
Cr ³⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	baseline
Cr ⁴⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	baseline
Cr ⁶⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ⁸⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ⁹⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ¹⁰⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ¹¹⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ¹²⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ¹³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ¹⁴⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ¹⁵⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ¹⁶⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ¹⁷⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ¹⁸⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ¹⁹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ²⁰⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cr ²¹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ‡	NIST 2013-11-08	NIST 2013-10-18	baseline
Mn ⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ⁴⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ⁵⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline

Table 1. (*Cont.*)

Species	Energy	Transition	Collision
Mn ⁷⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ⁸⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ⁹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ¹⁰⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ¹¹⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ¹²⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ¹³⁺ ‡	NIST Fernández-Menchero et al. (2014b)	Fernández-Menchero et al. (2014b)	Fernández-Menchero et al. (2014b)
Mn ¹⁴⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ¹⁵⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ¹⁶⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ¹⁷⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ¹⁸⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ¹⁹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ²⁰⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ²¹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Mn ²²⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ‡	NIST 2013-10-18	NIST 2013-10-18	Hollenbach & McKee (1989)
Fe ⁺	Verner et al. (1999)	Verner et al. (1999)	Verner et al. (1999)
Fe ²⁺ ‡	Zhang (1996)	Zhang (1996)	Zhang (1996)
Fe ³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ⁴⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ⁵⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ⁶⁺ ‡	Witthoeft & Badnell (2008)	Witthoeft & Badnell (2008)	Witthoeft & Badnell (2008)
Fe ⁸⁺	NIST 2014-09-16 Del Zanna et al. (2014)	Del Zanna et al. (2014)	Del Zanna et al. (2014)
Fe ⁹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ¹⁰⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ¹²⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ¹³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ¹⁴⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ¹⁵⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ¹⁶⁺	NIST 2014-09-16	NIST 2014-09-16	baseline

Table 1. (*Cont.*)

Species	Energy	Transition	Collision
Fe ¹⁷⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ¹⁸⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ¹⁹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ²⁰⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ²¹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ²²⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Fe ²³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ⁺ ‡	NIST 2014-09-16	NIST 2014-09-16 Storey et al. (2015)	Storey et al. (2015)
Co ²⁺ ‡	NIST 2014-09-16	NIST 2014-09-16 Storey & Sochi (2016)	Storey & Sochi (2016)
Co ⁷⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ⁹⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ¹⁰⁺ ‡	NIST 2013-10-01	NIST 2013-10-01	Pelan & Berrington (1995)
Co ¹¹⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ¹²⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ¹³⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ¹⁴⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ¹⁵⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ¹⁶⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ¹⁷⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ¹⁸⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ¹⁹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ²⁰⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ²¹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ²²⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ²³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Co ²⁴⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ‡	NIST 2013-10-01	NIST 2013-10-01	Hollenbach & McKee (1989)
Ni ⁺	NIST 2013-10-01	NIST 2013-10-01	Cassidy et al. (2011)
Ni ²⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ³⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ⁴⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline

Table 1. (*Cont.*)

Species	Energy	Transition	Collision
Ni ⁶⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ⁸⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ¹⁰⁺	NIST 2014-09-16 Del Zanna et al. (2014)	Del Zanna et al. (2014)	Del Zanna et al. (2014)
Ni ¹¹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ¹²⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ¹³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ¹⁴⁺	Del Zanna et al. (2014) NIST	Del Zanna et al. (2014)	Del Zanna et al. (2014)
Ni ¹⁵⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ¹⁶⁺	Aggarwal et al. (2007)	Aggarwal et al. (2007)	Hudson et al. (2012)
Ni ¹⁷⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ¹⁸⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ¹⁹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ²⁰⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ²¹⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ²²⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ²³⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ²⁴⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Ni ²⁵⁺	NIST 2014-09-16	NIST 2014-09-16	baseline
Cu ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cu ¹²⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cu ¹³⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cu ¹⁴⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cu ¹⁵⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cu ¹⁶⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cu ¹⁷⁺ ‡	NIST Fernández-Menchero et al. (2014b)	Fernández-Menchero et al. (2014b)	Fernández-Menchero et al. (2014b)
Cu ²⁰⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cu ²¹⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cu ²²⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cu ²³⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline
Cu ²⁴⁺ ‡	NIST 2014-09-16	NIST 2014-09-16	baseline

Table 1. (*Cont.*)

Species	Energy	Transition	Collision
$\text{Zn}^+ \ddagger$	NIST	Kisieliu et al. (2015)	Kisieliu et al. (2015)
$\text{Zn}^{3+} \ddagger$	NIST		baseline
$\text{Zn}^{18+} \ddagger$	NIST Fernández-Menchero et al. (2014b)	Fernández-Menchero et al. (2014b)	Fernández-Menchero et al. (2014b)

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