

Appendix Table 1. Ionization energies (I_2) and electron affinity (I_1) of the elements (in eV/atom) at 0° K.

Z		I_1	I_1	I_2	I_3	I_4	I_5	I_6	I_7
1	H	0.75	13.6						
2	He	0	24.59	54.4					
3	Li	0.62	5.39	75.6	122.5				
4	Be	<0	9.32	18.2	153.9	217.7			
5	B	0.28	8.3	25.2	37.9	259.4	340.2		
6	C	1.26	11.26	24.4	47.9	64.5	392.1	490	
7	N	<0	14.53	29.6	47.5	77.5	97.9	552.1	667
8	O	1.46	13.62	35.1	54.9	77.4	113.9	138.1	739.3
9	F	3.4	17.42	35	62.7	87.1	114.2	157.2	185.2
10	Ne	<0	21.56	41	63.5	97.1	126.2	157.9	207.3
11	Na	0.55	5.14	47.3	71.6	98.9	138.4	172.2	208.5
12	Mg	<0	7.65	15	80.1	109.2	141.3	186.5	224.9
13	Al	0.44	5.99	18.8	28.5	120	153.7	190.5	241.4
14	Si	1.39	8.15	16.4	33.5	45.1	166.8	205.1	246.5
15	P	0.75	10.49	19.7	30.2	51.4	65	220.4	263.2
16	S	2.08	10.36	23.3	34.8	47.3	72.7	88.1	280.9
17	Cl	3.62	12.97	23.8	39.6	53.5	67.8	97	114.2
18	Ar	<0	15.76	27.6	40.7	59.8	75	91	124.3
19	K	0.5	4.34	31.6	45.7	60.9	82.7	100	117.6
20	Ca	<0	6.11	11.9	50.9	67.1	84.4	108.8	127.7
21	Sc	0.19	6.54	12.8	24.8	73.5	91.7	111.1	138
22	Ti	0.08	6.82	13.6	27.5	43.3	99.2	119.4	140.8
23	V	0.53	6.74	14.7	29.3	46.7	65.2	128.1	150.2
24	Cr	0.67	6.77	16.5	31	49.1	69.3	90.6	161.1
25	Mn	<0	7.44	15.6	33.7	51.2	72.4	95	119.3
26	Fe	0.16	7.87	16.2	30.7	54.8	75	99	125
27	Co	0.66	7.86	17.1	33.5	51.3	79.5	102	129
28	Ni	1.16	7.64	18.2	35.2	54.9	75.5	108	133
29	Cu	1.23	7.73	20.3	36.8	55.2	79.9	103	139
30	Zn	<0	9.39	18	39.7	59.4	82.6	108	134
31	Ga	0.3	6	20.5	30.7	64			
32	Ge	1.2	7.9	15.9	34.2	45.7	93.5		
33	As	0.81	9.81	18.6	28.4	50.1	62.6	127.6	
34	Se	2.02	9.75	21.2	30.8	42.9	68.3	81.7	155.4
35	Br	3.37	11.81	21.8	36	47.3	59.7	88.6	103
36	Kr	<0	14	24.4	37	52.5	64.7	78.5	111
37	Rb	0.49	4.18	27.3	40	52.6	71	84.4	99.2
38	Sr	<0	5.7	11	43.6	57	71.6	90.8	106
39	Y	0.3	6.38	12.2	20.5	61.8	77	93	116
40	Zr	0.43	6.84	13.1	23	34.3	81.5		
41	Nb	0.89	6.88	14.3	25	38.3	50.6	102.6	125
42	Mo	0.75	7.1	16.2	27.2	46.4	61.2	68	126.8
43	Tc	0.55	7.28	15.3	29.5	(43)	(59)	(76)	(94)
44	Ru	1.05	7.37	16.8	28.5	(46)	(63)	(81)	(100)
45	Rh	1.14	7.46	18.1	31.1	(46)	(67)	(85)	(105)

Z		I ₋₁	I ₁	I ₂	I ₃	I ₄	I ₅	I ₆	I ₇
46	Pd	0.56	8.34	19.4	32.9	(49)	(66)	(90)	(111)
47	Ag	1.3	7.58	21.5	34.8	(52)	(70)	(89)	(116)
48	Cd	<0	8.99	16.9	37.5	(55)	(73)	(94)	(115)
49	In	0.3	5.79	18.9	28	54			
50	Sn	1.2	7.34	14.6	30.5	40.7	72.3		
51	Sb	1.07	8.64	16.5	25.3	44.2	56	108	
52	Te	1.97	9.01	18.6	28	37.4	58.8	70.7	137
53	I	3.06	10.45	19.1	33	(42)	(71)	(83)	(104)
54	Xe	<0	12.13	21.2	32.1				
55	Cs	0.47	3.89	25.1					
56	Ba	<0	5.21	10					
57	La	0.5	5.58	11.1	19.2	50			
58	Ce	0.5	5.47	10.9	20.2	36.8			
59	Pr	0	5.42	10.6	21.6	39	57.5		
60	Nd	<0	5.49	10.7	22.1	40.4			
61	Pm	<0	5.55	10.9	22.3	41.1			
62	Sm	0.3	5.63	11.1	23.4	41.4			
63	Eu	<0	5.67	11.2	24.9	42.6			
64	Gd	0.5	6.14	12.1	20.6	44			
65	Tb	0.5	5.85	11.5	21.9	39.8			
66	Dy	<0	5.93	11.7	22.8	41.5			
67	Ho	<0	6.02	11.8	22.8	42.5			
68	Er	<0	6.1	11.9	22.7	42.7			
69	Tm	0.3	6.18	12.1	23.7	42.7			
70	Yb	<0	6.25	12.2	25	43.7			
71	Lu	0.5	5.43	13.9	21	45.2			
72	Hf	~ 0	6.65	14.9	23.3	33.3			
73	Ta	0.32	7.89	(16)	(22)	(33)	(45)		
74	W	0.82	7.98	(18)	(24)	(35)	(48)	(61)	
75	Re	0.15	7.88	13.1	26	37.7	(51)	(65)	(79)
76	Os	1.1	8.7	(17)	(25)	(40)	(54)	(68)	(89)
77	Ir	1.57	9.1	(17)	(27)	(39)	(57)	(72)	(88)
78	Pt	2.13	9	18.6	(29)	(41)	(55)	(75)	(92)
79	Au	2.31	9.23	20.5	(30)	(44)	(58)	(73)	(96)
80	Hg	<0	10.44	18.8	34.2	(46)	(61)	(77)	(94)
81	Tl	0.2	6.11	20.4	29.8	(50)	(64)	(81)	(98)
82	Pb	0.36	7.42	15	31.9	42.3	68.8	(84)	(103)
83	Bi	0.95	7.29	16.7	25.6	45.3	56	88.3	(107)
84	Po	1.9	8.42	(19)	(27)	(38)	(61)	(73)	(112)
85	At	2.8	9.2	(20)	(29)	(41)	(51)	(78)	(91)
86	Rn	<0	10.75	(21)	(29)	(44)	(55)	(67)	(97)
87	Fr		3.98	(23)	(34)				
88	Ra		5.28	10.2	(34)				
89	Ac		5.17	12.1	(19)				
90	Th		6.08	11.5	20	28.8	(65)	(80)	(94)
91	Pa		5.89						
92	U		6.05	(15)	(25)				

Z		I ₋₁	I ₁	I ₂	I ₃	I ₄	I ₅	I ₆	I ₇
93	Np		6.19						
94	Pu		6.06						
95	Am		5.99						
96	Cm		6.02						
97	Bk		6.23						
98	Cf		6.3						
99	Es		6.42						
100	Fm		6.5						
101	Md		6.58						
102	No		6.65						
103	Lr								

Ionization energies (I_z) are from Dean (1985). Electron affinities (I_1) are from Hotop and Lineberger (1985), except REE which are from Bratsch (1983). The ionization energy I_z at 298K

$$\begin{aligned}
 \text{is } I_z(298^\circ \text{K}) &= I_z(0^\circ \text{K}) + \int_0^{298} [C_p(M^z) + C_p(e^-) - C_p(M^{z-1})]dT \\
 &= I_z(0^\circ \text{K}) + \int_0^{298} \frac{5}{2} k dT = I_z(0^\circ \text{K}) + 0.064 \text{eV}
 \end{aligned}$$

if M^z (g), e^- (g) and M^{z-1} (g) are assumed to be ideal gases and their heat capacities, C_p , equal to zero at 0°K , and $5/2k$ at other temperature (k = Boltzman constant).