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Table I. Refined estimates of non-relativistic stationary point-nucleus atomic energies^a.

Z	-E(3)	-E(4)	-E(5)	-E(6)	-E(7)	-E(8)	-E(9)	-E(10)	-E(11)	-E(12)	-E(13)	-E(14)	-E(15)	-E(16)	-E(17)	-E(18)
3 Li	7.47806	7.50084														
4 Be	14.32476	14.66739	14.66739													
5 B	23.42460	24.34889	24.65390	24.6642												
6 C	34.77551	36.53493	37.43095	37.8450	37.8916											
7 N	48.37690	51.22286	52.96636	54.0546	54.5893	54.5836										
8 O	64.22854	68.41176	71.25561	73.2750	74.5669	75.0674	75.1211									
9 F	82.33034	88.10119	92.29716	95.5014	97.8080	99.0930	99.7341	99.8590								
10 Ne	102.68223	110.29096	116.09019	120.7315	124.3070	126.6373	128.1437	128.9383								
11 Na	125.28419	134.98095	142.63422	148.9640	154.0612	157.6923	160.3258	162.0667	162.2554	162.275						
12 Mg	150.13619	162.17110	171.92896	180.1983	187.0689	192.2543	196.2715	199.2214	199.7732	200.054						
13 Al	177.23823	191.86135	203.97421	214.4338	223.3292	230.3214	235.9763	240.3925	241.4362	242.127	242.347	242.364				
14 Si	206.59029	224.05168	238.76983	251.6703	262.8414	271.8921	279.4376	285.5747	287.2305	288.459	289.060	289.360	289.411			
15 P	238.19238	258.74208	276.31574	291.9075	305.6050	316.9657	326.6538	334.7651	337.1494	339.036	340.145	340.872	341.260	341.287		
16 S	272.04448	295.93253	316.61188	335.1453	351.6199	365.5414	377.6237	387.9615	391.1892	393.851	395.589	396.870	397.731	398.111	398.187	
17 Cl	308.14659	335.62301	359.65819	381.3835	400.8856	417.6188	432.3465	445.1628	449.3474	452.899	455.384	457.339	458.799	459.673	460.150	460.283
18 Ar	346.49871	377.81352	405.45465	430.6221	453.4020	473.1976	490.8217	506.3678	511.6223	516.178	519.525	522.272	524.451	525.945	526.961	527.544
19 K	387.10084	422.50407	454.00123	482.8610	509.1691	532.2776	553.0488	571.5758	578.0129	583.685	588.010	591.664	594.679	596.914	598.596	599.762
20 Ca	429.95298	469.69463	505.29790	538.1002	568.1866	594.8585	619.0275	640.7864	648.5182	655.420	660.836	665.512	669.479	672.573	675.040	676.916
21 Sc	475.05513	519.38521	559.34466	596.3395	630.4546	660.9402	688.7576	713.9991	723.1376	731.382	738.001	743.812	748.846	752.916	756.286	758.993
22 Ti	522.40728	571.57580	616.14149	657.5791	695.9730	730.5225	762.2387	791.2135	801.8706	811.569	819.504	826.565	832.779	837.938	842.329	845.984
23 V	572.00943	626.26641	675.68838	721.8188	764.7416	803.6054	839.4708	872.4294	884.7169	895.981	905.346	913.767	921.275	927.639	933.165	937.884
24 Cr	623.86159	683.45702	737.98532	789.0586	836.7605	880.1888	920.4537	957.6465	971.6760	984.618	995.524	1005.419	1014.334	1022.015	1028.790	1034.689
25 Mn	677.96375	743.14765	803.03231	859.2985	912.0296	960.2726	1005.1873	1046.8648	1062.7477	1077.480	1090.038	1101.520	1111.953	1121.065	1129.203	1136.396
26 Fe	734.31591	805.33829	870.82934	932.5385	990.5489	1043.8568	1093.6715	1140.0840	1157.9319	1174.565	1188.888	1202.068	1214.133	1224.788	1234.401	1243.003
27 Co	792.91808	870.02893	941.37640	1008.7787	1072.3184	1130.9413	1185.9063	1237.3041	1257.2283	1275.874	1292.074	1307.064	1320.872	1333.183	1344.385	1354.507
28 Ni	853.77024	937.21958	1014.67349	1088.0189	1157.3381	1221.5261	1281.8915	1338.5249	1360.6368	1381.407	1399.594	1416.507	1432.170	1446.249	1459.152	1470.908

^a All values are in hartrees.

Table II. Refined estimates of total correlation energies.

Z	$-E_c(3)$	$-E_c(4)$	$-E_c(5)$	$-E_c(6)$	$-E_c(7)$	$-E_c(8)$	$-E_c(9)$	$-E_c(10)$	$-E_c(11)$	$-E_c(12)$	$-E_c(13)$	$-E_c(14)$	$-E_c(15)$	$-E_c(16)$	$-E_c(17)$	$-E_c(18)$
2 He	0.04204															
3 Li	0.04533	0.07261														
4 Be	0.04737	0.09436	0.09436													
5 B	0.04861	0.11132	0.12484	0.14497												
6 C	0.04945	0.12643	0.13873	0.15636	0.18274											
7 N	0.05005	0.14055	0.15057	0.16659	0.18834	0.26166										
8 O	0.05049	0.15404	0.16091	0.17485	0.19427	0.25798	0.33135									
9 F	0.05084	0.16714	0.17039	0.18180	0.19903	0.26128	0.32478	0.39954								
10 Ne	0.05112	0.17995	0.17934	0.18790	0.20281	0.26515	0.32584	0.39120								
11 Na	0.05135	0.19256	0.18791	0.19343	0.20588	0.26855	0.32843	0.38978	0.39648	0.42028						
12 Mg	0.05153	0.20501	0.19622	0.19854	0.20845	0.27142	0.33108	0.39060	0.40140	0.43943						
13 Al	0.05169	0.21735	0.20431	0.20333	0.21063	0.27386	0.33350	0.39210	0.40552	0.45253	0.47058	0.48593				
14 Si	0.05183	0.22960	0.21223	0.20788	0.21250	0.27598	0.33565	0.39377	0.40904	0.46337	0.48675	0.50567	0.52127			
15 P	0.05195	0.24178	0.22001	0.21223	0.21414	0.27784	0.33757	0.39539	0.41209	0.47285	0.50016	0.52262	0.54093	0.58814		
16 S	0.05205	0.25390	0.22768	0.21642	0.21557	0.27949	0.33929	0.39693	0.41476	0.48139	0.51189	0.53727	0.55752	0.60623	0.64903	
17 Cl	0.05214	0.26597	0.23526	0.22048	0.21684	0.28097	0.34085	0.39836	0.41713	0.48921	0.52245	0.55029	0.57218	0.62425	0.66828	0.70628
18 Ar	0.05222	0.27800	0.24277	0.22443	0.21797	0.28230	0.34227	0.39968	0.41924	0.49648	0.53215	0.56210	0.58542	0.64061	0.68691	0.72610
19 K	0.05229	0.29000	0.25021	0.22829	0.21899	0.28351	0.34356	0.40091	0.42114	0.50331	0.54116	0.57299	0.59757	0.65557	0.70412	0.74452
20 Ca	0.05236	0.30197	0.25759	0.23207	0.21990	0.28460	0.34475	0.40205	0.42286	0.50978	0.54964	0.58313	0.60883	0.66940	0.72007	0.76174
21 Sc	0.05242	0.31392	0.26493	0.23578	0.22073	0.28560	0.34584	0.40310	0.42443	0.51594	0.55766	0.59267	0.61938	0.68231	0.73494	0.77791
22 Ti	0.05247	0.32584	0.27223	0.23944	0.22149	0.28652	0.34685	0.40409	0.42587	0.52185	0.56532	0.60172	0.62934	0.69445	0.74893	0.79318
23 V	0.05252	0.33775	0.27949	0.24304	0.22217	0.28736	0.34777	0.40500	0.42719	0.52755	0.57266	0.61035	0.63879	0.70595	0.76216	0.80766
24 Cr	0.05256	0.34965	0.28672	0.24660	0.22280	0.28813	0.34863	0.40585	0.42841	0.53305	0.57972	0.61862	0.64782	0.71691	0.77475	0.82146
25 Mn	0.05260	0.36152	0.29393	0.25012	0.22338	0.28884	0.34943	0.40665	0.42954	0.53839	0.58656	0.62658	0.65648	0.72741	0.78680	0.83468
26 Fe	0.05264	0.37339	0.30111	0.25361	0.22392	0.28951	0.35017	0.40740	0.43059	0.54359	0.59320	0.63428	0.66482	0.73750	0.79836	0.84738
27 Co	0.05268	0.38525	0.30827	0.25707	0.22441	0.29012	0.35087	0.40810	0.43157	0.54867	0.59865	0.64175	0.67288	0.74724	0.80951	0.85962
28 Ni	0.05271	0.39710	0.31542	0.26050	0.22487	0.29069	0.35151	0.40876	0.43248	0.55363	0.60595	0.64901	0.68070	0.75667	0.82029	0.87146

^a All values are in hartrees.

Table III. Refined estimates of the "observable" ionization potentials^a.

Z	$I_{\text{expl}}^*(2)$	$I_{\text{expl}}^*(3)$	$I_{\text{expl}}^*(4)$	$I_{\text{expl}}^*(5)$	$I_{\text{expl}}^*(6)$	$I_{\text{expl}}^*(7)$	$I_{\text{expl}}^*(8)$	$I_{\text{expl}}^*(9)$	$I_{\text{expl}}^*(10)$	$I_{\text{expl}}^*(11)$	$I_{\text{expl}}^*(12)$	$I_{\text{expl}}^*(13)$	$I_{\text{expl}}^*(14)$	$I_{\text{expl}}^*(15)$	$I_{\text{expl}}^*(16)$	$I_{\text{expl}}^*(17)$	$I_{\text{expl}}^*(18)$
1 H	0.75																
2 He	24.59	0.00															
3 Li	75.64	5.39	0.62														
4 Be	153.89	18.21	9.32	0.00													
5 B	259.37	37.93	25.15	8.30	0.28												
6 C	392.09	64.49	47.89	24.38	11.26	1.27											
7 N	552.06	97.89	77.47	47.45	29.60	14.53	-0.15										
8 O	739.32	138.12	113.90	77.41	54.94	35.12	13.62	1.46									
9 F	953.89	185.19	157.16	114.24	87.18	62.71	34.97	17.43	3.40								
10 Ne	1195.80	239.10	207.27	157.93	126.28	97.20	63.43	40.96	21.57	0.00							
11 Na	1465.08	299.87	264.22	208.49	172.25	138.56	98.85	71.62	47.28	5.14	0.54						
12 Mg	1761.79	367.50	328.04	265.90	225.05	186.75	141.20	109.27	80.14	15.04	7.85	0.00					
13 Al	2085.96	442.02	398.72	330.18	284.71	241.77	190.44	153.83	119.99	28.45	18.83	5.99	0.46				
14 Si	2437.65	523.43	476.28	401.36	351.22	303.58	246.57	205.29	166.77	45.14	33.49	16.35	8.15	1.39			
15 P	2816.90	611.75	560.76	479.42	424.58	372.19	309.59	263.61	220.43	65.02	51.44	30.20	19.77	10.49	0.74		
16 S	3223.77	707.01	652.14	564.40	504.81	447.59	379.49	328.80	280.94	88.05	72.60	47.37	34.84	23.34	10.36	2.08	
17 Cl	3658.33	809.21	750.48	656.30	591.92	529.76	456.28	400.84	348.30	114.20	96.90	67.74	53.19	39.59	23.81	12.97	3.61
18 Ar	4120.65	918.40	855.75	755.14	685.93	618.69	539.98	479.72	422.51	143.45	124.34	91.29	74.75	59.11	40.72	27.63	15.76
19 K	4810.79	1034.56	968.00	860.96	786.84	714.39	630.57	565.43	503.55	175.81	154.89	117.98	99.47	81.81	60.93	45.72	31.63
20 Ca	5128.83	1157.75	1087.25	973.77	894.71	816.85	728.06	658.03	591.40	211.27	188.55	147.80	127.33	107.65	84.37	67.11	50.91
21 Sc	5674.89	1287.97	1213.52	1093.59	1009.54	926.01	832.53	757.40	686.11	249.83	225.32	180.73	158.30	136.60	111.00	91.72	73.47
22 Ti	6248.99	1425.30	1346.83	1220.43	1131.35	1041.93	943.89	863.66	787.63	291.49	265.20	216.77	192.38	168.63	140.78	119.50	99.25
23 V	6851.29	1569.67	1487.24	1354.36	1260.20	1164.59	1062.18	976.76	895.97	336.27	308.18	255.92	229.56	203.73	173.70	150.42	128.20
24 Cr	7481.87	1721.19	1634.73	1495.37	1396.09	1293.97	1187.43	1096.64	1011.14	384.15	354.28	298.21	269.85	241.88	209.74	184.46	160.28
25 Mn	8140.77	1879.88	1789.41	1643.46	1539.07	1430.12	1319.58	1223.44	1133.10	435.16	403.50	343.61	313.25	283.07	248.91	221.80	195.48
26 Fe	8828.14	2045.81	1951.18	1798.76	1689.22	1572.99	1458.69	1356.99	1261.97	489.29	455.85	392.10	359.74	327.30	291.19	261.83	233.77
27 Co	9544.15	2218.94	2120.21	1961.20	1846.43	1722.72	1604.64	1497.49	1397.55	546.57	511.33	443.77	409.36	374.56	336.58	305.15	275.15
28 Ni	10288.89	2399.27	2296.46	2130.88	2010.97	1879.13	1757.55	1644.74	1540.12	607.00	569.88	498.57	462.10	424.85	385.08	351.54	319.61

^a All values are in eV. Computed using $I_{\text{expl}}^* = (-\Delta E_c' - \Delta E_{\text{CAS}} - \Delta E_{\text{rel}})(R_2/R_{\infty})$.