

Summary Tables of Organic, Silicon, Boron and Aluminum Molecules

Tables summarizing the results of the calculated experimental parameters of 500 exemplary solved molecules follow. The closed-form derivations of these molecules can be found in *The Grand Theory of Classical Quantum Mechanics* posted at <http://www.blacklightpower.com/bookdownload.shtml> Chps. 15-17, as well as Silicon in Chp. 20, Boron in Chp. 22, and Aluminum in Chp. 23.

References at the end were used for all Calculated Total Bond Energies.

Table 1.1. The calculated and experimental total bond energies of n-alkanes using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₃ H ₈	Propane	41.46896	41.434	-0.00085
C ₄ H ₁₀	Butane	53.62666	53.61	-0.00036
C ₅ H ₁₂	Pentane	65.78436	65.77	-0.00017
C ₆ H ₁₄	Hexane	77.94206	77.93	-0.00019
C ₇ H ₁₆	Heptane	90.09976	90.09	-0.00013
C ₈ H ₁₈	Octane	102.25746	102.25	-0.00006
C ₉ H ₂₀	Nonane	114.41516	114.40	-0.00012
C ₁₀ H ₂₂	Decane	126.57286	126.57	-0.00003
C ₁₁ H ₂₄	Undecane	138.73056	138.736	0.00004
C ₁₂ H ₂₆	Dodecane	150.88826	150.88	-0.00008
C ₁₈ H ₃₈	Octadecane	223.83446	223.85	0.00008

Table 1.2. The calculated and experimental total bond energies of branched alkanes using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₄ H ₁₀	Isobutane	53.69922	53.695	-0.00007
C ₅ H ₁₂	Isopentane	65.85692	65.843	-0.00021
C ₅ H ₁₂	Neopentane	65.86336	65.992	0.00195
C ₆ H ₁₄	2-Methylpentane	78.01462	78.007	-0.00010
C ₆ H ₁₄	3-Methylpentane	78.01462	77.979	-0.00046
C ₆ H ₁₄	2,2-Dimethylbutane	78.02106	78.124	0.00132
C ₆ H ₁₄	2,3-Dimethylbutane	77.99581	78.043	0.00061
C ₇ H ₁₆	2-Methylhexane	90.17232	90.160	-0.00014
C ₇ H ₁₆	3-Methylhexane	90.17232	90.127	-0.00051
C ₇ H ₁₆	3-Ethylpentane	90.17232	90.108	-0.00072
C ₇ H ₁₆	2,2-Dimethylpentane	90.17876	90.276	0.00107
C ₇ H ₁₆	2,2,3-Trimethylbutane	90.22301	90.262	0.00044
C ₇ H ₁₆	2,4-Dimethylpentane	90.24488	90.233	-0.00013
C ₇ H ₁₆	3,3-Dimethylpentane	90.17876	90.227	0.00054
C ₈ H ₁₈	2-Methylheptane	102.33002	102.322	-0.00008
C ₈ H ₁₈	3-Methylheptane	102.33002	102.293	-0.00036
C ₈ H ₁₈	4-Methylheptane	102.33002	102.286	-0.00043
C ₈ H ₁₈	3-Ethylhexane	102.30169	102.274	-0.00027
C ₈ H ₁₈	2,2-Dimethylhexane	102.33646	102.417	0.00079
C ₈ H ₁₈	2,3-Dimethylhexane	102.31121	102.306	-0.00005
C ₈ H ₁₈	2,4-Dimethylhexane	102.40258	102.362	-0.00040
C ₈ H ₁₈	2,5-Dimethylhexane	102.40258	102.396	-0.00006
C ₈ H ₁₈	3,3-Dimethylhexane	102.33646	102.369	0.00032
C ₈ H ₁₈	3,4-Dimethylhexane	102.31121	102.296	-0.00015
C ₈ H ₁₈	3-Ethyl-2-methylpentane	102.31121	102.277	-0.00033
C ₈ H ₁₈	3-Ethyl-3-methylpentane	102.33646	102.317	-0.00019
C ₈ H ₁₈	2,2,3-Trimethylpentane	102.38071	102.370	-0.00010
C ₈ H ₁₈	2,2,4-Trimethylpentane	102.40902	102.412	0.00003

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₈ H ₁₈	2,3,3-Trimethylpentane	102.38071	102.332	-0.00048
C ₈ H ₁₈	2,3,4-Trimethylpentane	102.29240	102.342	0.00049
C ₈ H ₁₈	2,2,3,3-Tetramethylbutane	102.41632	102.433	0.00016
C ₉ H ₂₀	2,3,5-Trimethylhexane	114.54147	114.551	0.00008
C ₉ H ₂₀	3,3-Diethylpentane	114.49416	114.455	-0.00034
C ₉ H ₂₀	2,2,3,3-Tetramethylpentane	114.57402	114.494	-0.00070
C ₉ H ₂₀	2,2,3,4-Tetramethylpentane	114.51960	114.492	-0.00024
C ₉ H ₂₀	2,2,4,4-Tetramethylpentane	114.57316	114.541	-0.00028
C ₉ H ₂₀	2,3,3,4-Tetramethylpentane	114.58266	114.484	-0.00086
C ₁₀ H ₂₂	2-Methylnonane	126.64542	126.680	0.00027
C ₁₀ H ₂₂	5-Methylnonane	126.64542	126.663	0.00014

Table 1.3. The calculated and experimental total bond energies of alkenes using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₃ H ₆	Propene	35.56033	35.63207	0.00201
C ₄ H ₈	1-Butene	47.71803	47.78477	0.00140
C ₄ H ₈	trans-2-Butene	47.93116	47.90395	-0.00057
C ₄ H ₈	Isobutene	47.90314	47.96096	0.00121
C ₅ H ₁₀	1-Pentene	59.87573	59.95094	0.00125
C ₅ H ₁₀	trans-2-Pentene	60.08886	60.06287	-0.00043
C ₅ H ₁₀	2-Methyl-1-butene	60.06084	60.09707	0.00060
C ₅ H ₁₀	2-Methyl-2-butene	60.21433	60.16444	-0.00083
C ₅ H ₁₀	3-Methyl-1-butene	59.97662	60.01727	0.00068
C ₆ H ₁₂	1-Hexene	72.03343	72.12954	0.00133
C ₆ H ₁₂	trans-2-Hexene	72.24656	72.23733	-0.00013
C ₆ H ₁₂	trans-3-Hexene	72.24656	72.24251	-0.00006
C ₆ H ₁₂	2-Methyl-1-pentene	72.21854	72.29433	0.00105
C ₆ H ₁₂	2-Methyl-2-pentene	72.37203	72.37206	0.00000
C ₆ H ₁₂	3-Methyl-1-pentene	72.13432	72.19173	0.00080
C ₆ H ₁₂	4-Methyl-1-pentene	72.10599	72.21038	0.00145
C ₆ H ₁₂	3-Methyl-trans-2-pentene	72.37203	72.33268	-0.00054
C ₆ H ₁₂	4-Methyl-trans-2-pentene	72.34745	72.31610	-0.00043
C ₆ H ₁₂	2-Ethyl-1-butene	72.21854	72.25909	0.00056
C ₆ H ₁₂	2,3-Dimethyl-1-butene	72.31943	72.32543	0.00008
C ₆ H ₁₂	3,3-Dimethyl-1-butene	72.31796	72.30366	-0.00020
C ₆ H ₁₂	2,3-Dimethyl-2-butene	72.49750	72.38450	-0.00156
C ₇ H ₁₄	1-Heptene	84.19113	84.27084	0.00095
C ₇ H ₁₄	5-Methyl-1-hexene	84.26369	84.30608	0.00050
C ₇ H ₁₄	trans-3-Methyl-3-hexene	84.52973	84.42112	-0.00129
C ₇ H ₁₄	2,4-Dimethyl-1-pentene	84.44880	84.49367	0.00053
C ₇ H ₁₄	4,4-Dimethyl-1-pentene	84.27012	84.47087	0.00238
C ₇ H ₁₄	2,4-Dimethyl-2-pentene	84.63062	84.54445	-0.00102
C ₇ H ₁₄	trans-4,4-Dimethyl-2-pentene	84.54076	84.54549	0.00006
C ₇ H ₁₄	2-Ethyl-3-methyl-1-butene	84.47713	84.44910	-0.00033
C ₇ H ₁₄	2,3,3-Trimethyl-1-butene	84.51274	84.51129	-0.00002
C ₈ H ₁₆	1-Octene	96.34883	96.41421	0.00068
C ₈ H ₁₆	trans-2,2-Dimethyl-3-hexene	96.69846	96.68782	-0.00011
C ₈ H ₁₆	3-Ethyl-2-methyl-1-pentene	96.63483	96.61113	-0.00025
C ₈ H ₁₆	2,4,4-Trimethyl-1-pentene	96.61293	96.71684	0.00107

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₈ H ₁₆	2,4,4-Trimethyl-2-pentene	96.67590	96.65880	-0.00018
C ₁₀ H ₂₀	1-Decene	120.66423	120.74240	0.00065
C ₁₂ H ₂₄	1-Dodecene	144.97963	145.07163	0.00063
C ₁₆ H ₃₂	1-Hexadecene	193.61043	193.71766	0.00055

Table 1.4. The calculated and experimental total bond energies of alkynes using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₃ H ₄	Propyne	29.42932	29.40432	-0.00085
C ₄ H ₆	1-Butyne	41.58702	41.55495	-0.00077
C ₄ H ₆	2-Butyne	41.72765	41.75705	0.00070
C ₉ H ₁₆	1-Nonyne	102.37552	102.35367	-0.00021

Table 1.5. The calculated and experimental total bond energies of alkyl fluorides using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CF ₄	Tetrafluoromethane	21.07992	21.016	-0.00303
CHF ₃	Trifluoromethane	19.28398	19.362	0.00405
CH ₂ F ₂	Difluoromethane	18.22209	18.280	0.00314
C ₃ H ₇ F	1-Fluoropropane	41.86745	41.885	0.00041
C ₃ H ₇ F	2-Fluoropropane	41.96834	41.963	-0.00012

Table 1.6. The calculated and experimental total bond energies of alkyl chlorides using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CCl ₄	Tetrachloromethane	13.43181	13.448	0.00123
CHCl ₃	Trichloromethane	14.49146	14.523	0.00217
CH ₂ Cl ₂	Dichloromethane	15.37248	15.450	0.00499
CH ₃ Cl	Chloromethane	16.26302	16.312	0.00299
C ₂ H ₅ Cl	Chloroethane	28.61064	28.571	-0.00138
C ₃ H ₇ Cl	1-Chloropropane	40.76834	40.723	-0.00112
C ₃ H ₇ Cl	2-Chloropropane	40.86923	40.858	-0.00028
C ₄ H ₉ Cl	1-Chlorobutane	52.92604	52.903	-0.00044
C ₄ H ₉ Cl	2-Chlorobutane	53.02693	52.972	-0.00104
C ₄ H ₉ Cl	1-Chloro-2-methylpropane	52.99860	52.953	-0.00085
C ₄ H ₉ Cl	2-Chloro-2-methylpropane	53.21057	53.191	-0.00037
C ₅ H ₁₁ Cl	1-Chloropentane	65.08374	65.061	-0.00034
C ₅ H ₁₁ Cl	1-Chloro-3-methylbutane	65.15630	65.111	-0.00069
C ₅ H ₁₁ Cl	2-Chloro-2-methylbutane	65.36827	65.344	-0.00037
C ₅ H ₁₁ Cl	2-Chloro-3-methylbutane	65.16582	65.167	0.00002
C ₆ H ₁₃ Cl	2-Chlorohexane	77.34233	77.313	-0.00038
C ₈ H ₁₇ Cl	1-Chlorooctane	101.55684	101.564	0.00007
C ₁₂ H ₂₅ Cl	1-Chlorododecane	150.18764	150.202	0.00009
C ₁₈ H ₃₇ Cl	1-Chlorooctadecane	223.13384	223.175	0.00018

Table 1.7. The calculated and experimental total bond energies of alkyl bromides using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CBr ₄	Tetrabromomethane	11.25929	11.196	-0.00566
CHBr ₃	Tribromomethane	12.87698	12.919	0.00323
CH ₃ Br	Bromomethane	15.67551	15.732	0.00360
C ₂ H ₅ Br	Bromoethane	28.03939	27.953	-0.00308
C ₃ H ₇ Br	1-Bromopropane	40.19709	40.160	-0.00093
C ₃ H ₇ Br	2-Bromopropane	40.29798	40.288	-0.00024
C ₅ H ₁₀ Br ₂	2,3-Dibromo-2-methylbutane	63.48143	63.477	-0.00007
C ₆ H ₁₃ Br	1-Bromohexane	76.67019	76.634	-0.00047
C ₇ H ₁₅ Br	1-Bromoheptane	88.82789	88.783	-0.00051
C ₈ H ₁₇ Br	1-Bromooctane	100.98559	100.952	-0.00033
C ₁₂ H ₂₅ Br	1-Bromododecane	149.61639	149.573	-0.00029
C ₁₆ H ₃₃ Br	1-Bromohexadecane	198.24719	198.192	-0.00028

Table 1.8. The calculated and experimental total bond energies of alkyl iodides using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CHI ₃	Triiodomethane	10.35888	10.405	0.00444
CH ₂ I ₂	Diiodomethane	12.94614	12.921	-0.00195
CH ₃ I	Iodomethane	15.20294	15.163	-0.00263
C ₂ H ₅ I	Iodoethane	27.36064	27.343	-0.00066
C ₃ H ₇ I	1-Iodopropane	39.51834	39.516	-0.00006
C ₃ H ₇ I	2-Iodopropane	39.61923	39.623	0.00009
C ₄ H ₉ I	2-Iodo-2-methylpropane	51.96057	51.899	-0.00119

Table 1.9. The calculated and experimental total bond energies of alkene halides using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₂ H ₃ Cl	Chloroethene	22.46700	22.505	0.00170
C ₃ H ₃ Cl	2-Chloropropene	35.02984	35.05482	0.00071

Table 1.10. The calculated and experimental total bond energies of alcohols using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CH ₄ O	Methanol	21.11038	21.131	0.00097
C ₂ H ₆ O	Ethanol	33.40563	33.428	0.00066
C ₃ H ₈ O	1-Propanol	45.56333	45.584	0.00046
C ₃ H ₈ O	2-Propanol	45.72088	45.766	0.00098
C ₄ H ₁₀ O	1-Butanol	57.72103	57.736	0.00026
C ₄ H ₁₀ O	2-Butanol	57.87858	57.922	0.00074
C ₄ H ₁₀ O	2-Methyl-1-propananol	57.79359	57.828	0.00060
C ₄ H ₁₀ O	2-Methyl-2-propananol	58.15359	58.126	-0.00048
C ₅ H ₁₂ O	1-Pentanol	69.87873	69.887	0.00011

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₅ H ₁₂ O	2-Pentanol	70.03628	70.057	0.00029
C ₅ H ₁₂ O	3-Pentanol	70.03628	70.097	0.00087
C ₅ H ₁₂ O	2-Methyl-1-butananol	69.95129	69.957	0.00008
C ₅ H ₁₂ O	3-Methyl-1-butananol	69.95129	69.950	-0.00002
C ₅ H ₁₂ O	2-Methyl-2-butananol	70.31129	70.246	-0.00092
C ₅ H ₁₂ O	3-Methyl-2-butananol	69.96081	70.083	0.00174
C ₆ H ₁₄ O	1-Hexanol	82.03643	82.054	0.00021
C ₆ H ₁₄ O	2-Hexanol	82.19398	82.236	0.00052
C ₇ H ₁₆ O	1-Heptanol	94.19413	94.214	0.00021
C ₈ H ₁₈ O	1-Octanol	106.35183	106.358	0.00006
C ₈ H ₁₈ O	2-Ethyl-1-hexanol	106.42439	106.459	0.00032
C ₉ H ₂₀ O	1-Nonanol	118.50953	118.521	0.00010
C ₁₀ H ₂₂ O	1-Decanol	130.66723	130.676	0.00007
C ₁₂ H ₂₆ O	1-Dodecanol	154.98263	154.984	0.00001
C ₁₆ H ₃₄ O	1-Hexadecanol	203.61343	203.603	-0.00005

Table 1.11. The calculated and experimental total bond energies of ethers using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₂ H ₆ O	Dimethyl ether	32.84496	32.902	0.00174
C ₃ H ₈ O	Ethyl methyl ether	45.19710	45.183	-0.00030
C ₄ H ₁₀ O	Diethyl ether	57.54924	57.500	-0.00086
C ₄ H ₁₀ O	Methyl propyl ether	57.35480	57.355	0.00000
C ₄ H ₁₀ O	Isopropyl methyl ether	57.45569	57.499	0.00075
C ₆ H ₁₄ O	Dipropyl ether	81.86464	81.817	-0.00059
C ₆ H ₁₄ O	Disopropyl ether	82.06642	82.088	0.00026
C ₆ H ₁₄ O	t-Butyl ethyl ether	82.10276	82.033	-0.00085
C ₇ H ₁₆ O	t-Butyl isopropyl ether	94.36135	94.438	0.00081
C ₈ H ₁₈ O	Dibutyl ether	106.18004	106.122	-0.00055
C ₈ H ₁₈ O	Di-sec-butyl ether	106.38182	106.410	0.00027
C ₈ H ₁₈ O	Di-t-butyl ether	106.36022	106.425	0.00061
C ₈ H ₁₈ O	t-Butyl isobutyl ether	106.65628	106.497	-0.00218

Table 1.12. The calculated and experimental total bond energies of 1° amines using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CH ₅ N	Methylamine	23.88297	23.857	-0.00110
C ₂ H ₇ N	Ethylamine	36.04067	36.062	0.00060
C ₃ H ₉ N	Propylamine	48.19837	48.243	0.00092
C ₄ H ₁₁ N	Butylamine	60.35607	60.415	0.00098
C ₄ H ₁₁ N	sec-Butylamine	60.45696	60.547	0.00148
C ₄ H ₁₁ N	t-Butylamine	60.78863	60.717	-0.00118
C ₄ H ₁₁ N	Isobutylamine	60.42863	60.486	0.00094

Table 1.13. The calculated and experimental total bond energies of 2° amines using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₂ H ₇ N	Dimethylamine	35.76895	35.765	-0.00012
C ₄ H ₁₁ N	Diethylamine	60.22930	60.211	-0.00030
C ₆ H ₁₅ N	Dipropylamine	84.54470	84.558	0.00016
C ₆ H ₁₅ N	Diisopropylamine	84.74648	84.846	0.00117
C ₈ H ₁₉ N	Dibutylamine	108.86010	108.872	0.00011
C ₈ H ₁₉ N	Diisobutylamine	109.00522	109.106	0.00092

Table 1.14. The calculated and experimental total bond energies of 3° amines using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₃ H ₉ N	Trimethylamine	47.83338	47.761	-0.00152
C ₆ H ₁₅ N	Triethylamine	84.30648	84.316	0.00012
C ₉ H ₂₁ N	Tripropylamine	120.77958	120.864	0.00070

Table 1.15. The calculated and experimental total bond energies of aldehydes using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CH ₂ O	Formaldehyde	15.64628	15.655	0.00056
C ₂ H ₄ O	Acetaldehyde	28.18711	28.198	0.00039
C ₃ H ₆ O	Propanal	40.34481	40.345	0.00000
C ₄ H ₈ O	Butanal	52.50251	52.491	-0.00022
C ₄ H ₈ O	Isobutanal	52.60340	52.604	0.00001
C ₅ H ₁₀ O	Pentanal	64.66021	64.682	0.00034
C ₇ H ₁₄ O	Heptanal	88.97561	88.942	-0.00038
C ₈ H ₁₆ O	Octanal	101.13331	101.179	0.00045
C ₈ H ₁₆ O	2-Ethylhexanal	101.20587	101.259	0.00053

Table 1.16. The calculated and experimental total bond energies of ketones using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₃ H ₆ O	Acetone	40.68472	40.672	-0.00031
C ₄ H ₈ O	2-Butanone	52.84242	52.84	-0.00005
C ₅ H ₁₀ O	2-Pentanone	65.00012	64.997	-0.00005
C ₅ H ₁₀ O	3-Pentanone	65.00012	64.997	-0.00005
C ₅ H ₁₀ O	3-Methyl-2-butanone	65.10101	65.036	-0.00099
C ₆ H ₁₂ O	2-Hexanone	77.15782	77.152	-0.00008
C ₆ H ₁₂ O	3-Hexanone	77.15782	77.138	-0.00025
C ₆ H ₁₂ O	2-Methyl-3-pentanone	77.25871	77.225	-0.00043
C ₆ H ₁₂ O	3,3-Dimethyl-2-butanone	77.29432	77.273	-0.00028
C ₇ H ₁₄ O	3-Heptanone	89.31552	89.287	-0.00032
C ₇ H ₁₄ O	4-Heptanone	89.31552	89.299	-0.00018
C ₇ H ₁₄ O	2,2-Dimethyl-3-pentanone	89.45202	89.458	0.00007

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₇ H ₁₄ O	2,4-Dimethyl-3-pentanone	89.51730	89.434	-0.00093
C ₈ H ₁₆ O	2,2,4-Trimethyl-3-pentanone	101.71061	101.660	-0.00049
C ₉ H ₁₈ O	2-Nonanone	113.63092	113.632	0.00001
C ₉ H ₁₈ O	5-Nonanone	113.63092	113.675	0.00039
C ₉ H ₁₈ O	2,6-Dimethyl-4-heptanone	113.77604	113.807	0.00027

Table 1.17. The calculated and experimental total bond energies of carboxylic acids using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CH ₂ O ₂	Formic acid	21.01945	21.036	0.00079
C ₂ H ₄ O ₂	Acetic acid	33.55916	33.537	-0.00066
C ₃ H ₆ O ₂	Propanoic acid	45.71686	45.727	0.00022
C ₄ H ₈ O ₂	Butanoic acid	57.87456	57.883	0.00015
C ₅ H ₁₀ O ₂	Pentanoic acid	70.03226	69.995	-0.00053
C ₅ H ₁₀ O ₂	3-Methylbutanoic acid	70.10482	70.183	0.00111
C ₅ H ₁₀ O ₂	2,2-Dimethylpropanoic acid	70.31679	69.989	-0.00468
C ₆ H ₁₂ O ₂	Hexanoic acid	82.18996	82.149	-0.00050
C ₇ H ₁₄ O ₂	Heptanoic acid	94.34766	94.347	0.00000
C ₈ H ₁₆ O ₂	Octanoic acid	106.50536	106.481	-0.00022
C ₉ H ₁₈ O ₂	Nonanoic acid	118.66306	118.666	0.00003
C ₁₀ H ₂₀ O ₂	Decanoic acid	130.82076	130.795	-0.00020
C ₁₂ H ₂₄ O ₂	Dodecanoic acid	155.13616	155.176	0.00026
C ₁₄ H ₂₈ O ₂	Tetradecanoic acid	179.45156	179.605	0.00085
C ₁₅ H ₃₀ O ₂	Pentadecanoic acid	191.60926	191.606	-0.00002
C ₁₆ H ₃₂ O ₂	Hexadecanoic acid	203.76696	203.948	0.00089
C ₁₈ H ₃₆ O ₂	Stearic acid	228.08236	228.298	0.00094
C ₂₀ H ₄₀ O ₂	Eicosanoic acid	252.39776	252.514	0.00046

Table 1.18. The calculated and experimental total bond energies of carboxylic acid esters using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₂ H ₄ O ₂	Methyl formate	32.71076	32.762	0.00156
C ₃ H ₆ O ₂	Methyl acetate	45.24849	45.288	0.00087
C ₆ H ₁₂ O ₂	Methyl pentanoate	81.72159	81.726	0.00005
C ₇ H ₁₄ O ₂	Methyl hexanoate	93.87929	93.891	0.00012
C ₈ H ₁₆ O ₂	Methyl heptanoate	106.03699	106.079	0.00040
C ₉ H ₁₈ O ₂	Methyl octanoate	118.19469	118.217	0.00018
C ₁₀ H ₂₀ O ₂	Methyl nonanoate	130.35239	130.373	0.00016
C ₁₁ H ₂₂ O ₂	Methyl decanoate	142.51009	142.523	0.00009
C ₁₂ H ₂₄ O ₂	Methyl undecanoate	154.66779	154.677	0.00006
C ₁₃ H ₂₆ O ₂	Methyl dodecanoate	166.82549	166.842	0.00010
C ₁₄ H ₂₈ O ₂	Methyl tridecanoate	178.98319	179.000	0.00009
C ₁₅ H ₃₀ O ₂	Methyl tetradecanoate	191.14089	191.170	0.00015
C ₁₆ H ₃₂ O ₂	Methyl pentadecanoate	203.29859	203.356	0.00028
C ₄ H ₈ O ₂	Propyl formate	57.76366	57.746	-0.00030
C ₄ H ₈ O ₂	Ethyl acetate	57.63888	57.548	-0.00157
C ₅ H ₁₀ O ₂	Isopropyl acetate	69.89747	69.889	-0.00013

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₅ H ₁₀ O ₂	Ethyl propanoate	69.79658	69.700	-0.00139
C ₆ H ₁₂ O ₂	Butyl acetate	81.95428	81.873	-0.00099
C ₆ H ₁₂ O ₂	t-Butyl acetate	82.23881	82.197	-0.00051
C ₆ H ₁₂ O ₂	Methyl 2,2-dimethylpropanoate	82.00612	81.935	-0.00087
C ₇ H ₁₄ O ₂	Ethyl pentanoate	94.11198	94.033	-0.00084
C ₇ H ₁₄ O ₂	Ethyl 3-methylbutanoate	94.18454	94.252	0.00072
C ₇ H ₁₄ O ₂	Ethyl 2,2-dimethylpropanoate	94.39651	94.345	-0.00054
C ₈ H ₁₆ O ₂	Isobutyl isobutanoate	106.44313	106.363	-0.00075
C ₈ H ₁₆ O ₂	Propyl pentanoate	106.26968	106.267	-0.00003
C ₈ H ₁₆ O ₂	Isopropyl pentanoate	106.37057	106.384	0.00013
C ₉ H ₁₈ O ₂	Butyl pentanoate	118.42738	118.489	0.00052
C ₉ H ₁₈ O ₂	sec-Butyl pentanoate	118.52827	118.624	0.00081
C ₉ H ₁₈ O ₂	Isobutyl pentanoate	118.49994	118.576	0.00064

Table 1.19. The calculated and experimental total bond energies of amides using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CH ₃ NO	Formamide	23.68712	23.697	0.00041
C ₂ H ₅ NO	Acetamide	36.15222	36.103	-0.00135
C ₃ H ₇ NO	Propanamide	48.30992	48.264	-0.00094
C ₄ H ₉ NO	Butanamide	60.46762	60.449	-0.00030
C ₄ H ₉ NO	2-Methylpropanamide	60.51509	60.455	-0.00099
C ₅ H ₁₁ NO	Pentanamide	72.62532	72.481	-0.00200
C ₅ H ₁₁ NO	2,2-Dimethylpropanamide	72.67890	72.718	0.00054
C ₆ H ₁₃ NO	Hexanamide	84.78302	84.780	-0.00004
C ₈ H ₁₇ NO	Octanamide	109.09842	109.071	-0.00025

Table 1.20. The calculated and experimental total bond energies of N-alkyl and N,N-dialkyl amides using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₃ H ₇ NO	N,N-Dimethylformamide	47.53142	47.574	0.00090
C ₄ H ₉ NO	N,N-Dimethylacetamide	60.14455	59.890	-0.00426
C ₆ H ₁₃ NO	N-Butylacetamide	84.63649	84.590	-0.00055

Table 1.21. The calculated and experimental total bond energies of urea using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CH ₄ N ₂ O	Urea	31.35919	31.393	0.00108

Table 1.22. The calculated and experimental total bond energies of acid halide using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₂ H ₃ ClO	Acetyl chloride	28.02174	27.990	-0.00115

Table 1.23. The calculated and experimental total bond energies of acid anhydrides using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₄ H ₆ O ₃	Acetic anhydride	56.94096	56.948	0.00013
C ₆ H ₁₀ O ₃	Propanoic anhydride	81.25636	81.401	0.00177

Table 1.24. The calculated and experimental total bond energies of nitriles using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₂ H ₃ N	Acetonitrile	25.72060	25.77	0.00174
C ₃ H ₅ N	Propanenitrile	37.87830	37.94	0.00171
C ₄ H ₇ N	Butanenitrile	50.03600	50.08	0.00082
C ₄ H ₇ N	2-Methylpropanenitrile	50.13689	50.18	0.00092
C ₅ H ₉ N	Pentanenitrile	62.19370	62.26	0.00111
C ₅ H ₉ N	2,2-Dimethylpropanenitrile	62.47823	62.40	-0.00132
C ₇ H ₁₃ N	Heptanenitrile	86.50910	86.59	0.00089
C ₈ H ₁₅ N	Octanenitrile	98.66680	98.73	0.00069
C ₁₀ H ₁₉ N	Decanenitrile	122.98220	123.05	0.00057
C ₁₄ H ₂₇ N	Tetradecanenitrile	171.61300	171.70	0.00052

Table 1.25. The calculated and experimental total bond energies of thiols using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
HS	Hydrogen Sulfide	3.77430	3.653	-0.03320
H ₂ S	Dihydrogen Sulfide	7.56058	7.605	0.00582
CH ₄ S	Methanethiol	19.60264	19.575	-0.00141
C ₂ H ₆ S	Ethanethiol	31.76034	31.762	0.00005
C ₃ H ₈ S	1-Propanethiol	43.91804	43.933	0.00035
C ₃ H ₈ S	2-Propanethiol	44.01893	44.020	0.00003
C ₄ H ₁₀ S	1-Butanethiol	56.07574	56.089	0.00024
C ₄ H ₁₀ S	2-Butanethiol	56.17663	56.181	0.00009
C ₄ H ₁₀ S	2-Methyl-1-propanethiol	56.14830	56.186	0.00066
C ₄ H ₁₀ S	2-Methyl-2-propanethiol	56.36027	56.313	-0.00084
C ₅ H ₁₂ S	2-Methyl-1-butanethiol	68.30600	68.314	0.00012
C ₅ H ₁₂ S	1-Pentanethiol	68.23344	68.264	0.00044
C ₅ H ₁₂ S	2-Methyl-2-butanethiol	68.51797	68.441	-0.00113
C ₅ H ₁₂ S	3-Methyl-2-butanethiol	68.31552	68.381	0.00095
C ₅ H ₁₂ S	2,2-Dimethyl-1-propanethiol	68.51797	68.461	-0.00084
C ₆ H ₁₄ S	1-Hexanethiol	80.39114	80.416	0.00031
C ₆ H ₁₄ S	2-Methyl-2-pentanethiol	80.67567	80.607	-0.00085

C ₆ H ₁₄ S	2,3-Dimethyl-2-butanethiol	80.71992	80.603	-0.00145
C ₇ H ₁₆ S	1-Heptanethiol	92.54884	92.570	0.00023
C ₁₀ H ₂₂ S	1-Decanethiol	129.02194	129.048	0.00020

Table 1.26. The calculated and experimental total bond energies of sulfides using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₂ H ₆ S	Dimethyl sulfide	31.65668	31.672	0.00048
C ₃ H ₈ S	Ethyl methyl sulfide	43.81438	43.848	0.00078
C ₄ H ₁₀ S	Diethyl sulfide	55.97208	56.043	0.00126
C ₄ H ₁₀ S	Methyl propyl sulfide	55.97208	56.029	0.00102
C ₄ H ₁₀ S	Isopropyl methyl sulfide	56.07297	56.115	0.00075
C ₅ H ₁₂ S	Butyl methyl sulfide	68.12978	68.185	0.00081
C ₅ H ₁₂ S	t-Butyl methyl sulfide	68.28245	68.381	0.00144
C ₅ H ₁₂ S	Ethyl propyl sulfide	68.12978	68.210	0.00117
C ₅ H ₁₂ S	Ethyl isopropyl sulfide	68.23067	68.350	0.00174
C ₆ H ₁₄ S	Diisopropyl sulfide	80.48926	80.542	0.00065
C ₆ H ₁₄ S	Butyl ethyl sulfide	80.28748	80.395	0.00133
C ₆ H ₁₄ S	Methyl pentyl sulfide	80.28748	80.332	0.00056
C ₈ H ₁₈ S	Dibutyl sulfide	104.60288	104.701	0.00094
C ₈ H ₁₈ S	Di-sec-butyl sulfide	104.80466	104.701	-0.00099
C ₈ H ₁₈ S	Di-t-butyl sulfide	104.90822	104.920	0.00011
C ₈ H ₁₈ S	Diisobutyl sulfide	104.74800	104.834	0.00082
C ₁₀ H ₂₂ S	Ethyl propyl sulfide	128.91828	128.979	0.00047
C ₁₀ H ₂₂ S	Diisopentyl sulfide	129.06340	129.151	0.00068

Table 1.27. The calculated and experimental total bond energies of disulfides using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₂ H ₆ S ₂	Dimethyl disulfide	34.48127	34.413	-0.00199
C ₄ H ₁₀ S ₂	Diethyl disulfide	58.79667	58.873	0.00129
C ₆ H ₁₄ S ₂	Dipropyl disulfide	83.11207	83.169	0.00068
C ₈ H ₁₈ S ₂	Di-t-butyl disulfide	107.99653	107.919	-0.00072

Table 1.28. The calculated and experimental total bond energies of sulfoxides using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₂ H ₆ SO	Dimethyl sulfoxide	35.52450	35.435	-0.00253
C ₄ H ₁₀ SO	Diethyl sulfoxide	59.83990	59.891	0.00085
C ₆ H ₁₄ SO	Dipropyl sulfoxide	84.15530	84.294	0.00165

Table 1.29. The calculated and experimental total bond energies of sulfones using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₂ H ₆ SO ₂	Dimethyl sulfone	40.27588	40.316	0.00100

Table 1.30. The calculated and experimental total bond energies of sulfites using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₂ H ₆ SO ₃	Dimethyl sulfite	43.95058	44.042	0.00207
C ₄ H ₁₀ SO ₃	Diethyl sulfite	68.54939	68.648	0.00143
C ₈ H ₁₈ SO ₃	Dibutyl sulfite	117.18019	117.191	0.00009

Table 1.31. The calculated and experimental total bond energies of sulfates using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₂ H ₆ SO ₄	Dimethyl sulfate	48.70617	48.734	0.00058
C ₄ H ₁₀ SO ₄	Diethyl sulfate	73.30077	73.346	0.00061
C ₆ H ₁₄ SO ₄	Dipropyl sulfate	97.61617	97.609	-0.00008

Table 1.32. The calculated and experimental total bond energies of nitro alkanes using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CH ₃ NO ₂	Nitromethane	25.14934	25.107	-0.00168
C ₂ H ₅ NO ₂	Nitroethane	37.30704	37.292	-0.00040
C ₃ H ₇ NO ₂	1-Nitropropane	49.46474	49.451	-0.00028
C ₃ H ₇ NO ₂	2-Nitropropane	49.56563	49.602	0.00074
C ₄ H ₉ NO ₂	1-Nitrobutane	61.62244	61.601	-0.00036
C ₄ H ₉ NO ₂	2-Nitroisobutane	61.90697	61.945	0.00061
C ₅ H ₁₁ NO ₂	1-Nitropentane	73.78014	73.759	-0.00028

Table 1.33. The calculated and experimental total bond energies of nitrite using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CH ₃ NO ₂	Methyl nitrite	24.92328	24.955	0.00126

Table 1.34. The calculated and experimental total bond energies of nitrate using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CH ₃ NO ₃	Methyl nitrate	28.18536	28.117	-0.00244
C ₂ H ₅ NO ₃	Ethyl nitrate	40.34306	40.396	0.00131
C ₃ H ₇ NO ₃	Propyl nitrate	52.50076	52.550	0.00093
C ₃ H ₇ NO ₃	Isopropyl nitrate	52.60165	52.725	0.00233

Table 1.35. The calculated and experimental total bond energies of conjugated alkenes using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₅ H ₈	Cyclopentene	54.83565	54.86117	0.00047
C ₄ H ₆	1,3 Butadiene	42.09159	42.12705	0.00084
C ₅ H ₈	1,3 Pentadiene	54.40776	54.42484	0.00031
C ₅ H ₈	1,4 Pentadiene	54.03745	54.11806	0.00149
C ₅ H ₆	1,3 Cyclopentadiene	49.27432	49.30294	0.00058

Table 1.36. The calculated and experimental total bond energies of aromatics and heterocyclic aromatics using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₆ H ₆	Benzene	57.26008	57.26340	0.00006
C ₆ H ₅ Cl	Chlorobenzene	56.55263	56.581	0.00051
C ₆ H ₄ Cl ₂	m-dichlorobenzene	55.84518	55.852	0.00012
C ₆ H ₃ Cl ₃	1,2,3-trichlorobenzene	55.13773	55.077	-0.00111
C ₆ H ₃ Cl ₃	1,3,5-trichlorobenzene	55.29542	55.255	-0.00073
C ₆ Cl ₆	Hexachlorobenzene	52.57130	52.477	-0.00179
C ₆ H ₅ NO ₂	Nitrobenzene	65.18754	65.217	0.00046
C ₇ H ₈	Toluene	69.48425	69.546	0.00088
C ₇ H ₆ O ₂	Benzoic acid	73.76938	73.762	-0.00009
C ₇ H ₅ ClO ₂	2-chlorobenzoic acid	73.06193	73.082	0.00027
C ₇ H ₅ ClO ₂	3-chlorobenzoic acid	73.26820	73.261	-0.00010
C ₇ H ₅ ClO ₂	4-chlorobenzoic acid	73.26820	73.247	-0.00028
C ₆ H ₇ N	Aniline	64.43373	64.374	-0.00093
C ₇ H ₉ N	2-methylaniline	76.62345	76.643	-0.00025
C ₇ H ₉ N	3-methylaniline	76.62345	76.661	0.00050
C ₇ H ₉ N	4-methylaniline	76.62345	76.654	0.00040
C ₆ H ₆ N ₂ O ₂	2-nitroaniline	72.47476	72.424	-0.00070
C ₆ H ₆ N ₂ O ₂	3-nitroaniline	72.47476	72.481	-0.00009
C ₆ H ₆ N ₂ O ₂	4-nitroaniline	72.47476	72.476	-0.00002
C ₇ H ₇ NO ₂	Aniline-2-carboxylic acid	80.90857	80.941	0.00041
C ₇ H ₇ NO ₂	Aniline-3-carboxylic acid	80.90857	80.813	-0.00118
C ₇ H ₇ NO ₂	Aniline-4-carboxylic acid	80.90857	80.949	0.00050
C ₆ H ₆ O	Phenol	61.75817	61.704	-0.00087
C ₆ H ₄ N ₂ O ₅	2,4-dinitrophenol	77.61308	77.642	0.00037
C ₆ H ₈ O	Anisole	73.39006	73.355	-0.00047
C ₁₀ H ₈	Naphthalene	90.74658	90.79143	0.00049
C ₄ H ₅ N	Pyrrrole	44.81090	44.785	-0.00057

C ₄ H ₄ O	Furan	41.67782	41.692	0.00033
C ₄ H ₄ S	Thiophene	40.42501	40.430	0.00013
C ₃ H ₄ N ₂	Imidazole	39.76343	39.74106	-0.00056
C ₅ H ₅ N	Pyridine	51.91802	51.87927	-0.00075
C ₄ H ₄ N ₂	Pyrimidine	46.57597	46.51794	-0.00125
C ₄ H ₄ N ₂	Pyrazine	46.57597	46.51380	0.00095
C ₉ H ₇ N	Quinoline	85.40453	85.48607	0.00178
C ₉ H ₇ N	Isoquinoline	85.40453	85.44358	0.00046
C ₈ H ₇ N	Indole	78.52215	78.514	-0.00010
C ₅ H ₅ N ₅	Adenine	70.83735	70.79811	-0.00055

Table 1.37. The total bond energies of silanes calculated using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
SiH	Silylidyne	3.07526	3.02008	-0.01827
SiH ₂	Silylene	6.15052	6.35523	0.03221
SiH ₃	Silyl	9.22578	9.36494	0.01486
SiH ₄	Silane	13.57257	13.34577	-0.01699
Si ₂ H ₆	Disilane	21.76713	22.05572	0.01308
Si ₃ H ₈	Trisilane	31.23322	30.81334	-0.01363

Table 1.38. The total bond energies of alkyl silanes and disilanes calculated using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CH ₆ Si	Methylsilane	25.37882	25.99491	0.02370
C ₂ H ₈ Si	Dimethylsilane	38.45660	38.64819	0.00496
C ₃ H ₁₀ Si	Trimethylsilane	51.53438	51.33567	-0.00387
C ₄ H ₁₂ Si	Tetramethylsilane	64.61216	64.22319	-0.00606
C ₄ H ₁₂ Si	Diethylsilane	62.77200	63.37771	0.00956
C ₆ H ₁₆ Si	Triethylsilane	88.00748	87.46141	-0.00624
C ₈ H ₂₀ Si	Tetraethylsilane	113.24296	112.06547	-0.01051
CH ₈ Si ₂	Methyldisilane	34.56739	34.73920	0.00495
C ₂ H ₁₀ Si ₂	1,1-dimethyldisilane	47.36764	47.42283	0.00116
C ₂ H ₁₀ Si ₂	1,2-dimethyldisilane	47.36764	47.42283	0.00116
C ₃ H ₁₂ Si ₂	1,1,1-trimethyldisilane	60.16789	60.10646	-0.00102
C ₃ H ₁₂ Si ₂	1,1,2-trimethyldisilane	60.16789	60.10646	-0.00102
C ₄ H ₁₄ Si ₂	1,1,1,2-tetramethyldisilane	72.96815	72.79442	-0.00239
C ₄ H ₁₄ Si ₂	1,1,2,2-tetramethyldisilane	72.96815	72.79442	-0.00239
C ₅ H ₁₆ Si ₂	1,1,1,2,2-pentamethyldisilane	85.76840	85.47805	-0.00340
C ₆ H ₁₈ Si ₂	hexamethyldisilane	98.56865	98.32646	-0.00246

Table 1.39. The total bond energies of boranes calculated using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
BB	Diboron	3.12475	3.10405	-0.00667
B ₂ H ₆	Diborane	24.94229	24.89030	-0.00209
B ₄ H ₁₀	Tetraborane(10)	44.92160	45.33134	0.00904
B ₅ H ₉	Pentaborane(9)	48.25462	48.85411	0.01227
B ₅ H ₁₁	Pentaborane(11)	54.00546	53.06086	-0.01780
B ₆ H ₁₀	Hexaborane(10)	56.55063	56.74739	0.00347
B ₉ H ₁₅	Nonaborane(15)	85.61380	84.95008	-0.00781
B ₁₀ H ₁₄	Decaborane(14)	89.73467	89.69790	-0.00041

Table 1.40. The total bond energies of alkyl boranes calculated using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
CH ₃ B	methylborane	24.60991	24.49350	-0.00475
C ₂ H ₇ B	dimethylborane	37.08821	37.17713	0.00239
B ₂ CH ₈	methyldiborane	37.42060	37.58259	0.00431
B ₂ C ₂ H ₁₀	ethyldiborane	49.57830	49.50736	-0.00143
C ₃ H ₉ B	trimethylboron	49.56652	49.76102	0.00391
B ₂ C ₂ H ₁₀	1,1-dimethyldiborane	49.89890	50.20118	0.00602
B ₂ C ₂ H ₁₀	1,2-dimethyldiborane	49.89890	50.20118	0.00602
B ₄ CH ₁₂	methyltetraborane	57.39990	57.74604	0.00599
B ₅ CH ₁₁	methylpentaborane	60.73292	61.51585	0.01273
B ₂ C ₃ H ₁₂	trimethyldiborane	62.37721	62.88481	0.00807
B ₄ C ₂ H ₁₄	ethyltetraborane	69.55760	69.99603	0.00626
B ₅ C ₂ H ₁₃	ethylpentaborane	72.89062	73.76585	0.01186
B ₂ C ₄ H ₁₄	1,1-diethyldiborane	74.21430	74.34420	0.00175
B ₂ C ₄ H ₁₄	tetramethyldiborane	74.85551	75.48171	0.00830
B ₅ C ₃ H ₁₅	propylpentaborane	85.04832	85.84239	0.00925
C ₆ H ₁₅ B	triethylboron	86.03962	86.12941	0.00104
B ₂ C ₆ H ₁₈	triethyldiborane	98.85031	98.59407	-0.00260
B ₁₀ CH ₁₆	methyldecaborane	102.21298	101.91775	-0.00290
C ₈ H ₁₇ B	n-butylboracyclopentane	105.35916	105.69874 ^a	0.00321
B ₁₀ C ₂ H ₁₈	ethyldecaborane	114.37068	113.56066	-0.00713
C ₉ H ₂₁ B	tripropylboron	122.51272	122.59753	0.00069
C ₉ H ₂₁ B	tri-isopropylboron	122.81539	122.75798	-0.00047
B ₂ C ₈ H ₂₂	tetraethyldiborane	123.48631	123.74017	0.00205
B ₁₀ C ₃ H ₂₀	propyldecaborane	126.52838	125.94075	-0.00467
C ₁₂ H ₂₇ B	tri-s-butylboron	159.28849	158.50627	-0.00493
C ₁₂ H ₂₇ B	tributylboron	158.98582	159.03530	0.00031
C ₁₂ H ₂₇ B	tri-isobutylboron	159.20350	159.34318	0.00088
C ₁₈ H ₁₅ B	triphenylboron	172.15755	172.09681	-0.00035
C ₁₅ H ₃₃ B	tri-3-methylbutylboron	195.67660	195.78095	0.00053
C ₁₈ H ₃₃ B	tricyclohexylboron	217.24711	218.23763	0.00454
C ₁₈ H ₃₉ B	tri-n-hexylboron	231.93202	231.76340	-0.00073
C ₂₁ H ₄₅ B	tri-n-heptylboron	268.40512	268.22285	-0.00068
C ₂₄ H ₅₁ B	tri-s-octylboron	305.18089	304.61292	-0.00186
C ₂₄ H ₅₁ B	tri-n-octylboron	304.87822	304.68230	-0.00064

^a Crystal.

Table 1.41. The total bond energies of alkoxy boranes and borinic acids calculated using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
BH ₃ O	hydroxyborane	18.29311	18.22572	-0.00370
BH ₃ O ₂	dihydroxyborane	24.45460	24.43777]	-0.00069
BH ₃ O ₃	boric acid	30.61610	30.68431	0.00222
BC ₂ H ₇ O ₂	dimethoxyborane	47.75325	47.72358	-0.00062
BC ₃ H ₉ O ₃	trimethyl borate	65.56408	65.53950	-0.00037
C ₅ H ₁₁ OB	methoxyboracyclopentane	71.24858	74.47566 ^a	0.00345
C ₆ H ₇ O ₂ B	phenylborinic acid	77.79659	78.86121 ^a	0.01350
C ₆ H ₁₅ O ₂ B	di-isoproxyborane	96.97471	97.41737 ^a	0.00454
BC ₆ H ₁₅ O ₃	triethyl borate	102.62050	102.50197	-0.00116
C ₈ H ₁₉ OB	di-n-butylborinic acid	116.19591	116.45117	0.00219
BC ₉ H ₂₁ O ₃	tri-n-propyl borate	139.09360	139.11319	0.00014
C ₁₂ H ₂₇ OB	n-butyl di-n-butylborinate	164.51278	165.29504 ^a	0.00473
C ₁₂ H ₂₇ O ₂ B	di-n-butyl n-butylboronate	170.03974	170.86964 ^a	0.00486
BC ₁₂ H ₂₇ O ₃	tri-n-butyl borate	175.56670	175.62901	0.00035
C ₁₈ H ₁₅ O ₃ B ₃	phenylborinic anhydride	204.75082	205.96548 ^a	0.00590
C ₁₆ H ₃₆ OB ₂	di-n-butylborinic anhydride	222.84551	223.70232 ^a	0.00383
C ₂₄ H ₂₀ OB ₂	diphenylborinic anhydride	240.40782	241.38941 ^a	0.00407

^a Crystal.

Table 1.42. The total bond energies of tertiary and quaternary amino boranes and borane amines calculated using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
B ₂ H ₇ N	aminodiborane	32.36213	31.99218	-0.01156
B ₂ C ₂ H ₁₁ N	n-dimethylaminodiborane	57.21517	57.52855	0.00545
C ₆ H ₁₈ N ₃ B	tris(dimethylamino)borane	108.95023	108.64490	-0.00281
C ₈ H ₂₀ NB	di-n-butylboronamine	117.45425	119.49184 ^a	0.01705
C ₁₂ H ₂₈ NB	di-n-butylboron-n-butylamine	166.49595	167.83269 ^a	0.00796
C ₂ H ₁₀ NB	dimethylaminoborane	49.30740	49.52189	0.00433
BC ₃ H ₁₂ N	trimethylaminoborane	61.37183	61.05205	-0.00524
BC ₃ H ₁₂ N	ammonia-trimethylborane	62.91857	62.52207	-0.00634
C ₆ H ₁₈ NB	triethylaminoborane	97.84493	97.42044	-0.00436
BC ₆ H ₁₈ N	trimethylaminotrimethylborane	98.80674	98.27036	-0.00546

^a Crystal.

Table 1.43. The total bond energies of halidoboranes calculated using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
HBF ₂	difluoroboron	17.55666	17.41845	-0.00793
BF ₃	boron trifluoride	20.26918	20.09744	-0.00855
BF ₂ HO	difluoroborinic acid	23.71816	23.64784	-0.00297
BFH ₂ O ₂	fluoroboronic acid	27.16713	27.18135	0.00052
BCH ₃ F ₂	difluoro-methyl-borane	30.03496	30.33624	0.00993
BC ₂ H ₃ F ₂	vinyl difluoroborane	36.21893	36.54981	0.00905
BC ₃ H ₉ NF ₃	trimethylamine-trifluoroborane	69.50941	69.11368	-0.00573
HBCl ₂	dichloroboron	13.21640	13.25291	0.00276
BCl ₃	boron trichloride	13.75879	13.80748	0.00353
BCl ₂ F	dichlorofluoroborane	15.92892	15.87507	-0.00339
BClF ₂	chlorodifluoroborane	18.09905	17.98169	-0.00653
C ₂ H ₅ OCl ₂ B	ethoxydichloroborane	43.37936	43.55732	0.00409
C ₂ H ₄ O ₂ ClB	2-chloro-1,3,2-dioxaborolan	43.68867	43.99361 ^a	0.00693
C ₂ H ₆ NCl ₂ B	dimethylaminodichloroborane	45.48927	45.73940	0.00547
BC ₂ ClH ₆ O ₂	dimethoxychloroborane	48.29565	48.40390	0.00224
C ₃ H ₆ O ₂ ClB	4-methyl-2-chloro-1,3,2-dioxaborolan	55.94726	56.39537 ^a	0.00795
BC ₆ H ₅ Cl ₂	phenylboron dichloride	66.55838	66.97820	0.00627
C ₄ H ₈ O ₂ ClB	4,5-dimethyl-2-chloro-1,3,2-dioxaborolan	68.23418	68.72342 ^a	0.00712
C ₄ H ₁₀ O ₂ ClB	diethoxychloroborane	72.99993	73.07735	0.00106
C ₄ H ₁₂ N ₂ ClB	bis(dimethylamino)chloroborane	77.21975	77.38078	0.00208
C ₈ H ₁₈ ClB	di-n-butylchloroborane	110.57681	110.99317	0.00375
C ₁₂ H ₁₀ ClB	diphenylchloroborane	119.35796	119.79335	0.00363

^a Crystal.

Table 1.44. The total bond energies of gaseous organoaluminum hydrides calculated using closed-form equations having integers and fundamental constants only.

Formula	Name	Calculated Total Bond Energy (eV)	Experimental Total Bond Energy (eV)	Relative Error
C ₂ H ₇ Al	Dimethylaluminum hydride	34.31171	34.37797 ^a	0.00193
C ₃ H ₉ Al	Trimethyl aluminum	47.10960	46.95319	-0.00333
C ₄ H ₁₁ Al	Diethylaluminum hydride	58.62711	60.10948 ^b	0.02466
C ₆ H ₁₅ Al	Triethylaluminum hydride	83.58270	83.58176	-0.00001
C ₆ H ₁₅ Al	Di-n-propylaluminum hydride	82.94251	84.40566 ^b	0.01733
C ₉ H ₂₁ Al	Tri-n-propyl aluminum	120.05580	121.06458 ^b	0.00833
C ₈ H ₁₉ Al	Di-n-butylaluminum hydride	107.25791	108.71051 ^b	0.01336
C ₈ H ₁₉ Al	Di-isobutylaluminum hydride	107.40303	108.77556 ^b	0.01262
C ₁₂ H ₂₇ Al	Tri-n-butyl aluminum	156.52890	157.42429 ^b	0.00569
C ₁₂ H ₂₇ Al	Tri-isobutyl aluminum	156.74658	157.58908 ^b	0.00535

^a Estimated.

^b Crystal.

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