BOND DISSOCIATION ENERGIES

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The bond dissociation energy (enthalpy) is also referred to as bond disruption energy, bond energy, bond strength, or binding energy (abbreviation: BDE, BE, or D). It is defined as the standard enthalpy change of the following fission: $R-X \to R+X$. The BDE, denoted by $D^o(R-X)$, is usually derived by the thermochemical equation, $D^o(R-X) = \Delta_f H^o(R) + \Delta_f H^o(X) - \Delta_f H^o(RX)$. The enthalpy of formation $\Delta_f H^o$ of a large number of atoms, free radicals, ions, clusters and compounds is available from the websites of NIST, NASA, CODATA, and IUPAC. Most authors prefer to use the BDE values at 298.15 K.

The following seven tables provide essential information of experimental BDE values of R-X and R^*-X bonds.

- (1) Table 1: Bond Dissociation Energies in Diatomic Molecules
- (2) Table 2: Enthalpy of Formation of Gaseous Atoms
- (3) Table 3: Bond Dissociation Energies in Polyatomic Molecules
- (4) Table 4: Enthalpies of Formation of Free Radicals and Other Transient Species
- (5) Table 5: Bond Dissociation Energies of Common Organic Molecules
- (6) Table 6: Bond Dissociation Energies in Diatomic Cations
- (7) Table 7: Bond Dissociation Energies in Polyatomic Cations

The data in these tables have been revised through September 2009.

TABLE 1. Bond Dissociation Energies in Diatomic Molecules

The BDEs in diatomic species have usually been measured by spectroscopy or mass spectrometry. In the absence of data on the enthalpy function, the values at 0 K, D° (A–B), are converted to D°_{298} by the approximate equation:

$$D^{o}_{298}(A-B) \approx D^{o}(A-B) + (3/2)RT = D^{o}(A-B) + 3.7181 \text{ kJ mol}^{-1}$$

This table has been arranged in an alphabetical order of the atoms A in the diatomics A–B.

A-B	$D^{o}_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	А-В	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	А-В	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	А-В	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.
Ас-О	794	1	Ag–Sn	136 ± 21	1	Al–Sb	216.3 ± 6	1	Ar–Si	5.86	1
Ag-Ag	162.9 ± 2.9	1	Ag–Te	195.8 ± 14.6	1	Al–Se	318 ± 13	1	Ar–Sn	< 5.1	1
Ag–Al	183.7 ± 9.2	1	Al–Al	264.3 ± 0.5	1	Al–Si	246.9 ± 12.6	1	Ar–Tl	4.09	1
Ag–Au	202.5 ± 9.6	1	Al–Ar	5.69	1	Al–Te	268 ± 13	1	Ar–Xe	5.28	1
Ag–Bi	192 ± 42	1	Al–As	202.7 ± 7.1	1	Al–Ti	263.4	1	Ar–Zn	5.0	1
Ag–Br	280.3 ± 1.3	1	Al–Au	325.9 ± 6.3	1	Al–U	326 ± 29	1	As-As	385.8 ± 10.5	1
Ag-Cl	279.1 ± 8.4	1	Al–Br	429.2 ± 5.8	1	Al–V	147.4 ± 1.0	1	As-Cl	448	1
Ag–Cu	171.5 ± 9.6	1	Al–C	267.7	1	Al–Xe	7.39	1	As-D	270.3	1
Ag–D	226.8	1	Al–Ca	52.7	1	Am–O	553 ± 36	1	As-F	410	1
Ag-Dy	130 ± 19	1	Al–Cl	502	1	Ar–Ar	4.91	1	As–Ga	202.5 ± 4.8	1
Ag–Eu	127 ± 13	1	Al–Co	181.6 ± 0.2	1	Ar–B	4.62	1	As-H	274.0 ± 2.9	1
Ag-F	356.9 ± 5.8	1	Al–Cr	222.9 ± 0.9	1	Ar–Br	~5.0	1	As-I	296.6 ± 24	1
Ag–Ga	159 ± 17	1	Al–Cu	227.1 ± 1.2	1	Ar–C	5.158	1	As–In	201 ± 10	1
Ag–Ge	174.5 ± 21	1	Al–D	290.4	1	Ar–Ca	4.44 ± 0.60	1	As-N	489 ± 2.1	1
Ag–H	202.4 ± 9.1	1	Al–F	675	1	Ar–Cd	5.57 ± 0.05	1	As-O	484 ± 8	1
Ag–Ho	124 ± 19	1	Al–H	288 ± 13	1	Ar–Ga	3.96	1	As-P	433.5 ± 12.6	1
Ag-I	234 ± 29	1	Al–I	369.9 ± 2.1	1	Ar–Ge	< 5.4	1	As-S	379.5 ± 6.3	1
Ag–In	166.5 ± 4.9	1	Al–Kr	6.05	1	Ar–He	3.96	1	As–Sb	330.5 ± 5.4	1
Ag–Li	186.1	1	Al–Li	76.1	1	Ar–Hg	5.32	1	As–Se	96	1
Ag–Mn	99.2 ± 21	1	Al–N	≤368 ± 15	1	Ar–I	~5.3	1	As-Tl	198.3 ± 14.6	1
Ag-Na	133.1 ± 12.6	1	Al–Ne	3.9	1	Ar–In	4.18	1	Au–Au	226.2 ± 0.5	1
Ag-Nd	<213	1	Al–Ni	224.7 ± 4.8	1	Ar–Kr	5.11	1	Au–B	367.8 ± 10.5	1
Ag-O	221 ± 21	1	Al–O	501.9 ± 10.6	1	Ar–Li	~7.82	1	Au–Ba	254.8 ± 10.0	1
Ag-S	216.7 ± 14.6	1	Al–P	216.7 ± 12.6	1	Ar–Mg	~3.7	1	Au–Be	237.7 ± 4.0	1
Ag–Se	210.0 ± 14.6	1	Al–Pd	254.4 ± 12.1	1	Ar–Na	~4.2	1	Au–Bi	293 ± 8.4	1
Ag–Si	185.1 ± 9.6	1	Al–S	332 ± 10	1	Ar–Ne	4.27	1	Au–Br	213 ± 21	1
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А-В	$D^o_{298}/\mathrm{kJ}\ \mathrm{mol}^{-1}$	Ref.	A-B	D⁰ /ld mol-1	Ref.	A-B	Do /kI mal-1	Ref.	А-В	Do /kl mol-1	Ref.
A-B Au-Ca	$D_{298}/$ K) IIIOI 250.4 ± 4.0	1	B–H	D_{298}^{o} /kJ mol ⁻¹ 345.2 ± 2.5	1	Bi-O	$D_{298}^{o}/\text{kJ mol}^{-1}$ 337.2 ± 12.6	1	Br–Sb	D_{298}^{o} /kJ mol ⁻¹ 314 ± 59	
Au–Ca Au–Ce	322 ± 18		в–п В–І	343.2 ± 2.5 361	1	Bi–D	357.2 ± 12.6 281.7 ± 13		Br–Sc	314 ± 59 444 ± 63	1
Au–Ce Au–Cl		1		512.2 ± 17	1	Bi–Pb		1	Br–Se		1 1
Au-Co	280 ± 13 218.0 ± 16.4	1 1	B–Ir B–La	335 ± 63	1	Bi–Pb	142.4 ± 3.0 315.5 ± 4.6	1 1	Br–Si	297 ± 84 358.2 ± 8.4	1
Au–Co Au–Cr	218.0 ± 16.4 223.7 ± 28.9	1	B-La B-N	377.9 ± 8.7	1	Bi–Sb	252.7 ± 3.9	1	Br–Sm	331.4	1
Au–Cr Au–Cs	253 ± 3.5	1	B–Ne	3.97	1	Bi–Sb	252.7 ± 5.9 280.3 ± 5.9	1	Br–Sn	337 ± 13	1
Au–Cu	227.1 ± 1.2	1	B-Ne B-O	809	1	Bi–Se	193 ± 13	1	Br–Sr	365	1
Au–Cu Au–D	322.2	1	B-P	347 ± 16.7	1	Bi–3ii	232.2 ± 11.3	1	Br–T	372.77	1
Au–Dy	259 ± 24	1	B–Pd	351.5 ± 16.7	1	Bi–Te	120.9 ± 12.6	1	Br–Tb	382.8	1
Au–Eu	245 ± 12	1	B–Pt	477.8 ± 16.7	1	Bk-O	598	1	Br–Tb	364	1
Au–Eu Au–F	294.1	1	B–Rh	477.8 ± 16.7 475.8 ± 21	1	Br–Br	193.859 ± 0.120	1	Br–Ti	373	1
Au–Fe	187.0 ± 19.3	1	B–Ru	475.8 ± 21 446.9 ± 21	1	Br–C	318.0 ± 8.4	1	Br–Tl	331 ± 21	1
Au–Ga	187.0 ± 19.3 290 ± 15	1	B–Ku B–S	577 ± 9.2	1	Br–Ca	339	1	Br–Tm	299.1	1
Au–Ga Au–Ge	273.2 ± 14.6	1	B–Sc	272 ± 63	1	Br–Cd	159 ± 96	1	Br–U	377 ± 15	1
Au–H	300.5 ± 2.6	4	B–Se	462 ± 14.6	1	Br–Cu Br–Ce	373.2	1	Br–V	439 ± 42	1
Au–Ho	267 ± 35	1	B–Si	317 ± 12	1	Br–Cl	219.32 ± 0.05	1	Br–W	329.3	1
Au–I	207 ± 33 276	1	B–3i B–Te	317 ± 12 354 ± 20	1	Br–Co	326 ± 42	1	Br–Xe	5.94 ± 0.02	1
Au–In	286.0 ± 5.7	1	B–Te B–Th	297 ± 33	1	Br–Cr	328.0 ± 24.3	1	Br–Y	3.94 ± 0.02 481 ± 84	1
Au–III Au–La	288.0 ± 3.7 457 ± 28	1	B-Ti	297 ± 33 272 ± 63	1	Br–Cr Br–Cs	328.0 ± 24.3 389.1 ± 4.2	1	Br–Yb	295.4	1
	457 ± 28 284.5 ± 6.7		B-II B-U		1				Br–ID		
Au–Li		1 1	B-Y	322 ± 33	1	Br–Cu Br–D	331 ± 25	1 1	Br–Zn	138 ± 29 420	1 1
Au–Lu	332 ± 19		Ba-Br	289 ± 63 402	1		370.74		C-C		1
Au-Mg	179.1 ± 2.7	1	Ba-Cl	443	1	Br–Dy	339.3 ± 10.5 361.3	1	C–C C–Ce	618.3 ± 15.4	1
Au–Mn Au–Na	197.7 ± 21 215.1 ± 12.6	1 1	Ba-Ci Ba-D	443 ≤193.7	1	Br–Er Br–Eu	548	1 1	C-Cl	443 ± 30 394.9 ± 13.4	1
Au–Na Au–Nd	215.1 ± 12.6 294 ± 29	1	Ba-D Ba-F	≤193.7 580.6	1	Br–Eu	280 ± 12	1	C-CI C-D	341.4	1
Au–Ni	247 ± 16.4	1	Ва-н	192.0	1	Br–Fe	243 ± 84	1	C-F	513.8 ± 10.0	1
	247 ± 10.4 223 ± 21	1	Ba-II Ba-I		1		402 ± 13	1		376.3 ± 28.9	1
Au–O Au–Pb	133 ± 42	1	Ba-O	322.6 ± 6.3 562 ± 13.4	1	Br–Ga Br–Gd	372.0	1	C–Fe C–Ge	455.7 ± 11	1
Au-Pd	142.7 ± 21	1	Ba-Pd		1	Br–Gu Br–Ge	347 ± 8	1	C–Ge C–H	338.4 ± 1.2	1
Au-Pu Au-Pr	311 ± 25	1	Ba-Pu Ba-Rh	221.8 ± 5.0 259.4 ± 25	1	Br–H	366.16 ± 0.20	1	C–H	540 ± 25	1
Au–Rb	243 ± 3.5	1	Ba-Kii Ba-S	259.4 ± 25 418 ± 21	1		74.9	1	C-II	253.1 ± 35.6	1
Au–Rb Au–Rh	232.6 ± 29	1	Be-Be	59	1	Br–Hg Br–Ho	321.8	1	C–I C–Ir	631 ± 5	1
Au–S	253.6 ± 14.6	1	Be-Be	316	1	Br–I	179.1 ± 0.4	1	C–II C–La	463 ± 20	1
Au–Sc	280 ± 40	1	Be-Cl	434	1	Br–In	409 ± 10	1	C-La C-Mo	482 ± 16	1
Au–Se	251.0 ± 14.6	1	Be-Ci Be-D	203.1	1	Br–K	379.1 ± 4.2	1	C-NO	750.0 ± 2.9	1
Au–Si		1	Be-F	573	1		446.2	1	C-Nb		1
Au–Sn	304.6 ± 6.0 256.5 ± 7.2	1	Be-H	221	1	Br–La Br–Li	418.8 ± 4.2	1	C-Ni	523.8 ± 14.5 337.0	1
Au–Sr	264 ± 42	1	Be-II	261	1	Br–Lı Br–Lu	301.5	1	C-O	1076.38 ± 0.67	1
Au–Tb	285 ± 33	1	Be-O	437	1	Br–Mg	317.96	1	C–Os	608 ± 25	1
Au–Tb	237.2 ± 14.6	1	Be-S	372 ± 59	1	Br–Mn	314.2 ± 9.6	1	C-P	507.5 ± 8.8	1
Au–U	318 ± 29	1	Be-T	204.4	1	Br–Mo	313.4	1	C-Pd	436 ± 20	1
Au–V	246.0 ± 8.7	1	Bi–Bi	204.4	1	Br-N	280.8 ± 21	1	C-Pt	577.8 ± 6.8	13
Au–Y	240.0 ± 8.7 310 ± 12	1	Bi–Br	240.2	1	Br–Na	363.1 ± 4.2		C-Rh	577.8 ± 0.8 580 ± 4	1
B–B	290	1	Bi–Cl	300.4 ± 4.2	1	Br–Nd	339.7	1	C–Ru	648 ± 13	1
										713.3 ± 1.2	
B–Br B–C	390.9 ± 0.5 448 ± 29	1	Bi–D	283.7 366.5 + 12.5	1	Br–Ni Br–O	360 ± 13	1	C-S		1
в–С В–Сd		1	Bi–F	366.5 ± 12.5	1		237.6 ± 0.4	1	C–Sc	444 ± 21	1
	301.0	1	Bi–Ga	158.6 ± 16.7	1	Br-P	≤329 248.5 ± 14.6	1	C–Se	590.4 ± 5.9	1
B–Ce	305 ± 21	1	Bi–H	≤283.3	1	Br–Pb	248.5 ± 14.6	1	C–Si	447 564 + 20	1
B-Cl	427	1	Bi–I	186.1 ± 5.8	1	Br-Pr	344.5	1	C-Tc	564 ± 29	1
B-D	341.0 ± 6.3	1	Bi–In	153.6 ± 1.7	1	Br–Rb	380.7 ± 4.2	1	C-Th	453 ± 17	1
B–F	732	1	Bi–Li	149.4	1	Br–S	218 ± 17	1	C–Ti	423 ± 30	1

А-В	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	A-B	$D^o_{_{298}}/\mathrm{kJ\ mol^{-1}}$	Ref.	A-B	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	A-B	$D^{o}_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.
C–U	455 ± 15	1	Cl–Cu	377.8 ± 7.5	1	Cl–Yb	374.5	1	Cu-In	187.4 ± 7.9	1
C-V	423 ± 24	1	Cl–D	436.303 ± 0.011	1	Cl–Zn	229 ± 8	1	Cu–Li	191.9	1
С-Ү	418 ± 14	1	Cl–Dy	392.4	1	Cl–Zr	530	1	Cu–Na	176.1 ± 16.7	1
C–Zr	495.8 ± 38.6	1	Cl–Er	448.6	1	Cm-O	710 ± 45	15	Cu-Ni	201.7 ± 9.6	1
Ca-Ca	16.52 ± 0.11	1	Cl–Eu	405.5	1	Co-Co	<127	1	Cu-O	287.4 ± 11.6	1
Ca-Cl	409 ± 8.7	1	Cl–F	260.83	1	Co-Cu	161.1 ± 16.4	1	Cu-S	274.5 ± 14.6	1
Ca-D	≤169.9	1	Cl–Fe	335.5	11	Co-D	270.2 ± 5.8	1	Cu-Se	255.2 ± 14.6	1
Ca-F	529	1	Cl–Ga	463 ± 13	1	Co-F	431 ± 63	1	Cu-Si	221.3 ± 6.3	1
Ca-H	223.8	1	Cl–Gd	451.0	1	Co–Ge	230 ± 21	1	Cu-Sn	170 ± 10	1
Ca-I	284.7 ± 8.4	1	Cl–Ge	390.8 ± 9.6	1	Со-Н	244.9 ± 4.8	1	Cu-Tb	191 ± 18	1
Ca-Kr	5.15 ± 0.72	1	Cl–H	431.361 ± 0.013	1	Co-I	280 ± 21	1	Cu-Te	230.5 ± 14.6	1
Ca–Li	84.9 ± 8.4	1	Cl–Hg	92.0 ± 9.2	1	Co-Mn	50 ± 8	1	D–D	443.3197 ± 0.0003	1
Са-О	383.3 ± 5.0	1	Cl–Ho	409.1	1	Co-Nb	267.02 ± 0.10	1	D–F	576.236 ± 0.011	1
Ca-Pd	347 - 360	1	Cl–I	211.3 ± 0.4	1	Со-О	397.4 ± 8.7	1	D–Ga	<276.5	1
Ca-S	335 ± 21	1	Cl–In	436 ± 8	1	Co-S	331	1	D–Ge	≤322	1
Ca-Xe	7.31 ± 0.96	1	Cl–K	433.0 ± 8.4	1	Co-Sc	240.1	7	D–H	439.2223 ± 0.0002	1
Cd-Cd	7.36	1	Cl–La	521.6	1	Co–Si	274.4 ± 17	1	D–Hg	42.05	1
Cd-Cl	208.4	1	Cl–Li	469 ± 13	1	Co-Ti	235.37 ± 0.10	1	D–I	302.33	1
Cd-F	305 ± 21	1	Cl–Lu	325.7 ± 2	1	Со-Ү	253.71 ± 0.10	1	D–In	246	1
Cd-H	69.0 ± 0.4	1	Cl–Mg	312	1	Co–Zr	306.39 ± 0.10	1	D-K	182.4	1
Cd-I	97.2 ± 2.1	1	Cl–Mn	337.6	11	Cr–Cr	152.0 ± 6	1	D–Li	240.24	1
Cd-In	134	1	Cl–N	333.9 ± 9.6	1	Cr–Cu	154.4 ± 14.5	1	D–Lu	302	1
Cd-K	7.3	1	Cl–Na	412.1 ± 8.4	1	Cr–F	523 ± 19	1	D–Mg	161.33 ± 0.32	1
Cd–Kr	5.17	1	Cl–Nd	418.7	1	Cr–Fe	~75	1	D–Mn	312 ± 6	1
Cd-Na	10.2	1	Cl–Ni	372.3	11	Cr–Ge	154 ± 7	1	D-N	341.6	1
Cd-Ne	3.97	1	Cl-O	267.47 ± 0.08	1	Cr–H	189.9 ± 6.7	1	D–Ni	≤302.9	1
Cd-O	236 ± 84	1	Cl–P	≤376	1	Cr–I	287.0 ± 24.3	1	D-O	429.64	1
Cd-S	208.5 ± 20.9	1	Cl–Pb	301 ± 50	1	Cr–N	377.8 ± 18.8	1	D-P	299.0	1
Cd-Se	127.6 ± 25.1	1	Cl–Pr	423.5	1	Cr–Nb	295.72 ± 0.06	1	D–Pt	≤350.2	1
Cd-Te	100.0 ± 15.1	1	Cl–Ra	343 ± 75	1	Cr–O	461 ± 8.7	1	D–S	350.62 ± 1.20	1
Cd-Xe	6.54	1	Cl–Rb	427.6 ± 8.4	1	Cr–Pb	105 ± 2	1	D–Si	302.5	1
Ce-Ce	251.7	1	Cl–S	241.8	1	Cr–S	331	1	D–Sr	167.7	1
Ce-Cl	457.0	1	Cl–Sb	360 ± 50	1	Cr–Sn	141 ± 3	1	D-T	444.91	1
Ce-F	582 ± 42	1	Cl–Sc	331	1	Cs–Cs	43.919 ± 0.010	1	D–Tl	193.0	1
Ce–I	333.8	1	Cl–Se	322	1	Cs-F	517.1 ± 7.7	1	D–Zn	88.7	1
Ce–Ir	575 ± 9	1	Cl–Si	416.7 ± 6.3	1	Cs-H	175.364	1	Dy-Dy	70.3	1
Ce-N	519 ± 21	1	Cl–Sm	418.7	1	Cs–Hg	8	1	Dy-F	531	1
Ce-O	790	1	Cl–Sn	350 ± 8	1	Cs–I	338.5 ± 2.1	1	Dy–I	269.0 ± 8.4	1
Ce-Os	524 ± 20	1	Cl–Sr	409	1	Cs–Li	72.9 ± 1.2	5	Dy-O	615	1
Ce–Pd	319 ± 21	1	Cl–T	438.64	1	Cs–Na	63.2 ± 1.3	1	Dy-S	414 ± 42	1
Ce-Pt	550 ± 5	1	Cl–Ta	544	1	Cs-O	293 ± 25	1	Dy–Se	322 ± 20	1
Ce–Rh	545 ± 7	1	Cl–Tb	470.1	1	Cs–Rb	49.57 ± 0.01	1	Dy-Te	234 ± 20	1
Ce–Ru	494 ± 12	1	Cl–Th	489	1	Cu–Cu	201	1	Er–Er	75 ± 29	1
Ce-S	569	1	Cl–Ti	405.4 ± 10.5	1	Cu–D	270.3	1	Er–F	565 ± 17	1
Ce–Se	494.5 ± 14.6	1	Cl–Tl	372.8 ± 2.1	1	Cu-Dy	144 ± 18	1	Er–I	315.8	1
Се-Те	189.4 ± 12.6	1	Cl–Tm	378.0	1	Cu–F	414	1	Er–O	606	1
Cf-O	498	1	Cl–U	439	1	Cu–Ga	215.9 ± 15	1	Er–S	418 ± 21	1
Cl–Cl	436.303 ± 0.011	8	Cl–V	477 ± 63	1	Cu–Ge	208.8 ± 21	1	Er–Se	326 ± 20	1
Cl-Co	343.9	11	Cl–W	419	1	Cu–H	254.8 ± 6	1	Er–Te	238 ± 20	1
Cl–Cr	380.3	11	Cl–Xe	7.08	1	Cu–Ho	144 ± 19	1	Es-O	460	1
Cl–Cs	445.7 ± 7.7	1	Cl–Y	523 ± 84	1	Cu–I	289 ± 63	1	Eu–Eu	45.2	1

Bert 544 64 F-TI 509-138 1 H-Hg 98946 - 0.0 1 Hg-TL 24146 1 Bu-1 28.31 1 F-TI 439 ± 21 1 H-H 28.32 1 F-TU 68 1 H-K 124.37 1 Hg-T 2.0 1 Bu-8 432 ± 34 1 F-W 594 1 H-Mg 12.18 ± 000 1 H-G-T 7.3 1 Bu-8 3657 ± 13.4 1 F-W 594 1 H-M 12.18 ± 000 1 H-G 7.3 1 I F-M 18.0 1 H-M 2.0 2 1 H-M 2.0 1 H-M 2.0 2.0 1 H-M 2.0 1 H-M 2.0 1 H-M 2.0 1 H-M 2.0 1 H-M <th>А-В</th> <th>$D^{o}_{298}/\mathrm{kJ\ mol^{-1}}$</th> <th>Ref.</th> <th>A-B</th> <th>$D^o_{298}/\mathrm{kJ\ mol^{-1}}$</th> <th>Ref.</th> <th>А-В</th> <th>$D^o_{298}/{ m kJ~mol^{-1}}$</th> <th>Ref.</th> <th>А-В</th> <th>$D^o_{298}/{ m kJ\ mol^{-1}}$</th> <th>Ref.</th>	А-В	$D^{o}_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	A-B	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	А-В	$D^o_{298}/{ m kJ~mol^{-1}}$	Ref.	А-В	$D^o_{298}/{ m kJ\ mol^{-1}}$	Ref.
	Eu-F		1	F–Ti		1	H–Hg	39.844	1	Hg-T	43.14	1
Def Parish	Eu-I	288.3	1	F-Tl	439 ± 21	1	H–I	298.26 ± 0.10	1	Hg–Te	<142	1
Eu-Res 38 s 34 s 4	Eu–Li	268.1 ± 12.6	1	F–Tm	510	1	H–In	243.1	1	Hg–Tl	2.9	1
Be-Se 36.57 ± 13.4 1 F-Xe 1548 1 H-Mg 127.18 ± 0.00 10 H-Mg 27.18 ± 0.00 1 C-75 6.63 ± 1.13 1 H-Mg 25.15 ± 5 1 H-MG 27.51 ± 0.00 1 P-T 16.00 6.63 ± 1.13 1 H-Mg 25.15 ± 1.30 1 H-MG 25.11 ± 1.30 1 H-MG 2	Eu-O	473	1	F–U	648	1	Н–К	174.576	1	Hg–Xe	6.65	1
Deficition	Eu-Rh	238 ± 34	1	F–V	590 ± 63	1	H–Li	238.039 ± 0.006	1	Hg–Zn	7.3	1
Fig. Fig.	Eu-S	365.7 ± 13.4	1	F-W	≤544	1	H–Mg	127.18 ± 0.006	10	Но–Но	70.3	1
F-Fe 47 1. F-No 251.6 ± 9.6 1. H-No 338.9 1. H-Os 284.14.6 1. F-Fe 47 47 1. F-Za 62.7 ± 25.15.5 1. H-No 28.21.9 ± 6 1. H-Os 33.3 ± 15 1. F-Ge 890 ± 17 1. F-Ee 11. H-No 29.0 ± 21 4. I-I 152.25 ± 25 1. F-Ge 533 ± 13 1. F-Ee 11. 48.3 1. H-P 297.0 ± 21 1. I-I 36.25 ± 22 ± 21 1. F-HI 606 680 ± 0.01 1. F-E 10. 1. H-P 297.0 ± 21 1. I-K 56.7 1. I-T F-HI 500 ± 15 1. F-E 10. 47.1 1. I-R 28.25 ± 21 1. 1. 1. 1. 1. 2. 2. 2. 1. 1. 1. 1. 2. 2. 2. 2. 1.	Eu-Se	302.9 ± 14.6	1	F–Xe	14.18	1	H–Mn	251 ± 5	1	Ho–I	275.1	1
F-Fe 447 1 F-Zh 364 + 35 1 H-Na 185.69 + 0.29 1 Ho-Te 33 ± 15 1 G-Ga 589 ± 17 1 F-Ee 118 1 H-Nb 522 ± 9.6 1 Ho-Te 259 ± 15 1 F-Ge 593 ± 13 1 Fe-Ge 210 ± 29 1 H-D 249 ± 20.29 1 I-In 366 ± 11 1 F-H 560 500 ± 0.011 1 Fe-H 148 ± 3 1 H-P 297 ± 2.1 1 I-K 322.5 ± 2.1 1 F-H 560 50 ± 0.015 1 Fe-D 470 ± 1 H-P 297 ± 2.5 1 I-K 30.56 ± 1 I-I 411.7 30.5 1 I-I 30.5 411.7 <th< td=""><td>Eu-Te</td><td>251.0 ± 14.6</td><td>1</td><td>F-Y</td><td>685.3 ± 13.4</td><td>1</td><td>Н-Мо</td><td>202.5 ± 18.3</td><td>9</td><td>Но-О</td><td>606</td><td>1</td></th<>	Eu-Te	251.0 ± 14.6	1	F-Y	685.3 ± 13.4	1	Н-Мо	202.5 ± 18.3	9	Но-О	606	1
F-Gat 584 ± 13 1 F-Zer 627.2 ± 10.5 1 H-Mb 221.9 ± 9.6 1 H-Get 225 ± 15 1 F-Ge 590 ± 17 1 Fe-Ge 210 ± 29 1 H-M 249 ± 14 ± 20 1 I-I 152,25 ± 21 1 F-H 569680 ± 0.01 1 Fe-H 148 ± 3 1 H-P 297.0 ± 2.1 1 I-K 325.5 ± 2.1 1 F-Hg 6606 ± 15 1 Fe-D 407.0 ± 10 1 H-Pb 2157 1 I-K 417.0 1 F-Hg 600 ± 15 1 Fe-D 407.0 ± 0.1 1 H-Pb 2157.0 1 I-K 417.0 1 I-K 417.0 1 I-K 417.0 1 I-K 417.0 2 1 I-K 203.2 2 1 I-K 417.0 2 1 I-K 417.0 2 2 2 2 2 2 2 2 2 2 </td <td>F-F</td> <td>158.670 ± 0.096</td> <td>1</td> <td>F–Yb</td> <td>≥517.6 ± 9.6</td> <td>1</td> <td>H-N</td> <td>≤338.9</td> <td>1</td> <td>Ho–S</td> <td>428.4 ± 14.6</td> <td>1</td>	F-F	158.670 ± 0.096	1	F–Yb	≥517.6 ± 9.6	1	H-N	≤338.9	1	Ho–S	428.4 ± 14.6	1
F-Gd 590 ± 17 1 Fe-Fe 118 1 H-Mo 240 ± 8 1 I-I 1522 ± 0.57 1 1 F-Ge 523 ± 13 1 Fe-Fe 2109 ± 29 1 H-PO 4299 ± 10.29 1 I-In 3052 ± 2.11 1 F-H 650 ± 15 1 Fe-H 148 ± 3 1 H-Pb 2570 ± 10 1 I-K 322 ± 2.11 1 F-H0 650 ± 15 1 Fe-S 328 ± 146 1 H-Pd 231 ± 25 1 I-K 325 ± 42 1 F-H0 500 1 Fe-Si 297 ± 25 1 H-Rb 241 ± 55 1 I-K 241 ± 55 1 I-K 241 ± 55 1 I-L 332 ± 12 1 I-M 263 ± 12 1	F–Fe	447	1	F–Zn	364 ± 63	1	H–Na	185.69 ± 0.29	1	Ho–Se	333 ± 15	1
F-Ge 523 ± 3 ± 3 1 Fe-Ge 210 ± 29 ± 3 1 H-O 429 ± 10 ± 20 ± 1 I-II 369 ± 11 1 He 1 He-P 287 ± 0 ± 1 I-II 360 ± 11 1 He 1 He-P 287 ± 0 ± 1 I-II I-II 225 ± 2 ± 1 1 F-H9 615 15 1 Fe-I 123 1 He-P 234 ± 25 1 I-II 411.7 1 I-II 341.7 1 I-II 411.7 1 I-II 1 1-II 411.7 1 I-II	F–Ga	584 ± 13	1	F–Zr	627.2 ± 10.5	1	H–Nb	>221.9 ± 9.6	1	Но-Те	≤259 ± 15	1
F-H 569,680 ± 0.011 1 F-H 148 ± 3 1 H-P 297,0 ± 2.1 1 I-K 32,5 ± 2.1 1 F-Hg 600 ± 15 1 F-C 123 1 H-PØ 257,5 ± 2.5 1 I-K 5,60 1 F-H 520 1 F-S 328,9 ± 146 1 H-PØ 234 ± 25 1 I-Li 345,2 ± 2.2 1 F-H 527,15 1 F-S 328,9 ± 146 1 H-RW 310,6 ± 3 1 I-Li 345,2 ± 2.2 1 F-M 516 ± 13 1 G-S 329,2 ± 5 1 H-RW 241,0 ± 5 1 I-Li 345,2 ± 2.2 1 F-M 4892 1 G-S 265,9 ± 5 4 H-S 230,7 ± 2.0 1 I-M 322,8 ± 9.6 1 F-Li 6590 ± 17.2 1 G-B 345 ± 13 1 H-S 233,7 ± 2.0 1 I-M 304,2 ± 2.1 1 I-M 30	F–Gd	590 ± 17	1	Fe–Fe	118	1	H–Ni	240 ± 8	1	I–I	152.25 ± 0.57	1
F-HH 650 ± 15 1 Fe-Hg 12 12 14 Fe-Hg 14 Fe-Hg 407.0 ± 1.0 1 H-Pd 24 ± 25 1 I-La 41.7 1 F-Ho 540 1 Fe-S 2829 ± 146 1 H-PB 30 1 I-La 3452 ± 2 1 F-Ho 516 ± 13 1 Fe-Si 297 ± 25 1 H-Rb 172.6 1 I-La 363.2 1 F-Ho 516 ± 13 1 Ge-G 43 1 H-Rb 223 ± 15 1 I-Mg 282.8 ± 9.6 1 F-Kr 6.6 1 Ga-H 206.9 ± 13 1 I-Mg 269.9 ± 17 1 I-Mg 282.8 ± 9.6 1 I-F 1 669.9 ± 17 1 I-Mg 669.9 ± 17 1 I-Mg 304.2 ± 2.1 1 I-F 1 I-F 406.1 3 40.4 3 4 1-S 205.1 1 I-Mg 304.2 ± 2.1	F–Ge	523 ± 13	1	Fe–Ge	210.9 ± 29	1	Н-О	429.91 ± 0.29	1	I–In	306.9 ± 1.1	1
F-Hg -1880 1 Fe-Do 407.0±1.0 1 H-Pd 234±25 1 I-La 411.7 21 Fe-Do 436.2±4.2 1 Fe-Do 328±14.6 1 H-Pb 330 1 I-La 345±2.4 1 Fe-Do 43 1 H-Rb 210±2.6 1 I-Mg 235±2.0 1 F-Mc 4892 1 Ga-Ga 4044 1 H-Rb 22±15 1 I-Mg 228±8.6 1 F-Mc 6690±17.2 1 Ga-H 265±5.9 4 H-S 3535±7.03 1 I-M 159±17 1 F-Lu 6690±17.2 1 Ga-D 34±13 1 H-Se 235±14.2 1 I-M 159±17 1 I-M 6690±17.2 1 Ga-D 33±13 1 I-M 35±12.1 1 I-M 33±13 1 I-M I-M 30±12.1 1 I-M 1-M 1-M 1-M I-M I-M	F–H	569.680 ± 0.011	1	Fe–H	148 ± 3	1	H–P	297.0 ± 2.1	1	I–K	322.5 ± 2.1	1
F-Ho 540 1 Fe-Si 328 ± 14.6 1 H-Pt 330 1 I-Li 352±4.2 1 F-I 5271.5 1 Fe-Si 297±25 1 H-Rb 12.6 1 I-Lu 26.3 1 F-I 516±13 1 Fe-Si 297±25 1 H-Rb 21.0±5.9 1 I-Mn 282±9.6 1 F-K 66.6 1 Ga-H 20.6±3.9 4 H-Rs 33.5±1.3 1 I-Mn 22.8±9.6 1 F-La 650±17.2 1 Ga-H 94.9±3 1 H-Se 2937±4.2 1 I-Mn 304±2.1 1 F-Li 455±17.1 1 Ga-B 40.8 1 H-Se 293±1.2 1 I-N 1 I-N 20.1 1 I-N 20.2 1 I-N	F–Hf	650 ± 15	1	Fe–I	123	1	H–Pb	≤157	1	I–Kr	5.67	1
F-I ≤271.5 1 Fe-Si 297 ± 25 1 H-Rb 172.6 1 I-Lu 263.2 1 F-In 516 ± 13 1 Fm-O 443 1 H-Rb 241.0 ± 5.9 1 I-Mg 229 1 F-K 489.2 1 Ga-Ga <106.4	F–Hg	~180	1	Fe-O	407.0 ± 1.0	1	H–Pd	234 ± 25	1	I–La	411.7	1
F-In 516 ± 13 1 Fm-O 443 1 H-Rh 241 ± 5.9 1 I-Mg 229 1 F-K 4892 1 Ga-Ga close 1 H-Ru 223 ± 15 1 I-Mm 2828 ± 96 1 F-Kr 6.6 1 Ga-H 2659 ± 5.9 4 H-Sc 333.7 ± 2 1 I-Mo 269 ± 17 1 F-Lu 659.0 ± 17.2 1 Ga-In 334 ± 13 1 H-Sc 233.7 ± 2 1 I-M 391 ± 1 1 F-Lu 405 ± 19 1 Ga-In 334 ± 13 1 H-Sc 205 ± 17 1 I-M 304 ± 2± 1 1 F-Mu 405 ± 17 1 Ga-In 331 ± 14.6 1 H-Sc 212.5 1 I-M 203 ± 1 I-I-M 203 ± 1 I-I-P 306 ± 2 I-I-M	F–Ho	540	1	Fe-S	328.9 ± 14.6	1	H–Pt	330	1	I–Li	345.2 ± 4.2	1
F-K 489.2 1 Ga-Ga 106.4 1 H-Ru 223±15 1 I-M 282±9.6 1 F-Kr 6.6 1 Ga-H 265±5.9 4 H-S 353.57±0.30 1 I-Mo 266.9 1 F-Lia 650±17.2 1 Ga-M 94.0±3 1 H-Sc 237±4.2 1 I-M 3042±1 1 F-Lia 577±21 1 Ga-Kr 4.08 1 H-Sc 201-7 1 I-M 3042±1 1 F-Mg 463 1 Ga-Kr 4.08 1 H-Sn 293±1.9 1 I-M 293±21 1 F-Mg 463 1 Ga-Ca 237±21 1 H-Sn 264±17 1 I-D 23±21 1 F-Mn 464 1 Ga-Sb 129±126 1 H-T 164±8 1 I-D 3062 1 F-Mn 43945 1 Ga-Sb <	F–I	≤271.5	1	Fe–Si	297 ± 25	1	H–Rb	172.6	1	I–Lu	263.2	1
F-Kr 6.6 1 Ga-H 265.9 ± 5.9 4 H-S 335.7 ± 0.30 1 I-Mo 266.9 1 F-La 650.9 ± 17.2 1 Ga-H 334 ± 13 1 H-Sc 239.7 ± 4.2 1 I-Mo 159 ± 17 1 F-Lu 405 ± 19 1 Ga-Kr 4.08 1 H-Sc 21.5 1 I-Nd 301.5 1 F-Mg 463 1 Ga-Li 133.1 ± 146 1 H-Si 29.3 ± 1.9 1 I-Ni 293.2 ± 1 1 F-Mg 463 1 Ga-Ci 237 ± 21 1 H-Si 29.3 ± 1.9 1 I-Ni 293.2 ± 1 1 F-Mg 463 1 Ga-Ci 237 ± 12.6 1 H-Si 14.4 1 I-Ni 293.2 ± 1.3 12 F-Mg 349 1 Ga-Ci 229.7 ± 12.6 1 H-Ti 240.49 1 I-Pi 196.2 243.1 ± 8.4 1 I-Pi	F–In	516 ± 13	1	Fm-O	443	1	H–Rh	241.0 ± 5.9	1	I–Mg	229	1
F-La 659.0 ± 17.2 1 Ga-l 334 ± 13 1 H-Sb 239.7 ± 4.2 1 I-Na 159 ± 17 1 F-Li 577 ± 21 1 Ga-ln 94.0 ± 3 1 H-Sc 205 ± 17 1 I-Na 304 ± 2.1 1 F-Lu 405 ± 19 1 Ga-Ru 4.08 1 H-Sc 212.5 1 I-Nd 301.5 1 F-Mn 446.2 ± 7.5 1 Ga-Cl 374 ± 21 1 H-Sc 264 ± 17 1 I-O 233 ± 1.3 12 F-Mn 446.2 1 Ga-P 229.7 ± 12.6 1 H-Ts 264 ± 8 1 I-P 93 ± 21 1 F-Na 349 1 Ga-Sc 12.20 ± 12.6 1 H-Ts 240.49 1 I-P 306.2 1 F-Na 345.212.6 1 Ga-Tc 255.21 1 H-TT 240.49 1 I-Ps 302.1 1 F-Na <td< td=""><td>F-K</td><td>489.2</td><td>1</td><td>Ga–Ga</td><td><106.4</td><td>1</td><td>H–Ru</td><td>223 ± 15</td><td>1</td><td>I–Mn</td><td>282.8 ± 9.6</td><td>1</td></td<>	F-K	489.2	1	Ga–Ga	<106.4	1	H–Ru	223 ± 15	1	I–Mn	282.8 ± 9.6	1
F-Li 577 ± 21 1 Ga-In 94.0 ± 3 1 H-Se 205 ± 17 1 I-Na 304.2 ± 2.1 1 F-Li 405 ± 19 1 Ga-Kr 408 1 H-Se 312.5 1 I-Nd 304.5 1 F-Mn 445.2 ± 7.5 1 Ga-Li 133.1 ± 14.6 1 H-Sr 293.3 ± 1.9 1 I-Ni 293.2 ± 1.3 1 F-Mn 445.2 ± 7.5 1 Ga-P 229.7 ± 12.6 1 H-Sr 164 ± 8 1 I-Pb 194 ± 38 1 F-Ma 464 1 Ga-Ps 229.7 ± 12.6 1 H-Te 240.49 1 I-Pb 1943 ± 38 1 F-Na 4349.7 1 Ga-Cs 226 ± 21 1 H-Te 270.7 ± 1.7 1 I-Rb 318.8 ± 2.1 1 F-Na 439.7 ± 5.9 2 Gd-Gd 265.3 ± 67.5 1 H-Ti 195.4 ± 8 1 I-Si 293.1 1	F–Kr	6.6	1	Ga–H	265.9 ± 5.9	4	H–S	353.57 ± 0.30	1	I–Mo	266.9	1
F-Lu 405 ± 19 1 Ga-Kr 4.08 1 H-Se 312.5 1 I-Nd 301.5 1 F-Mg 463 1 Ga-Li 133.1±14.6 1 H-Si 293.±19 1 I-Ni 293±21 1 F-Mm 445.2±7.5 1 Ga-D 274±21 1 H-Si 264±17 1 I-O 2334±13 12 F-Mo 4534 1 Ga-Sb 1920±12.6 1 H-T 164±8 1 I-P 306.2 1 F-Ni 2349 1 Ga-Sb 1920±12.6 1 H-T 404.94 1 I-PB 306.2 1 F-Ni 2373 1 Ga-Sb 12.1 H-T 240.91 1 I-Rb 318.±21 1 F-Ni 430.50 1 Ga-G 256.1 1 H-TI 195.±4 1 I-Si 233.1 1 F-Ni 430.±50 1 Gd-T 71	F–La	659.0 ± 17.2	1	Ga–I	334 ± 13	1	H–Sb	239.7 ± 4.2	1	I–N	159 ± 17	1
F-Mg 463 1 Ga-Li 133.1±14.6 1 H-Si 293.±1.9 1 I-Ni 293.±1.3 1 F-Mn 445.2±7.5 1 Ga-O 374±21 1 H-Sn 264±17 1 I-O 233.±1.3 12 F-Mo 464 1 Ga-P 229.7±12.6 1 H-Sr 164±8 1 I-Pb 194±38 1 F-Na 3349 1 Ga-Sb 192.0±12.6 1 H-TC 404.99 1 I-Pb 194±38 1 F-Na 477.3 1 Ga-Te 265±21 1 H-TC 270.7±1.7 1 I-Pb 3062 1 F-Na 452±12.6 1 Ga-We 25.77 1 H-TI 204.6±8.8 1 I-Sim 338.±2.1 1 F-Ni 430±50 1 Gd-G 206.45 1 H-TW 195±4 1 I-Sm 301 1 F-Pb 350±13 1 <td>F–Li</td> <td>577 ± 21</td> <td>1</td> <td>Ga–In</td> <td>94.0 ± 3</td> <td>1</td> <td>H–Sc</td> <td>205 ± 17</td> <td>1</td> <td>I–Na</td> <td>304.2 ± 2.1</td> <td>1</td>	F–Li	577 ± 21	1	Ga–In	94.0 ± 3	1	H–Sc	205 ± 17	1	I–Na	304.2 ± 2.1	1
F-Mn 445.2 ± 7.5 1 Ga-O 374 ± 21 1 H-Sn 264 ± 17 1 I-O 233.4 ± 1.3 1 F-Mo 464 1 Ga-P 229.7 ± 12.6 1 H-Sr 164 ± 8 1 I-Pb 194 ± 38 1 F-N 2349 1 Ga-Sb 192.0 ± 12.6 1 H-T 440.49 1 I-Pb 306.2 1 F-Na 545.2 ± 12.6 1 Ga-Te 2527 1 H-Ti 240.6 ± 88 1 I-Si 243.1 ± 8.4 1 F-Ni 439.7 ± 5.9 2 Gd-Gd 200.63 ± 67.5 1 H-Ti 195.4 ± 4 1 I-Si 243.1 ± 8.4 1 F-Ni 430 ± 50 1 Gd-I 333.8 1 H-Ti 195.4 ± 4 1 I-Si 293.1 1 F-Po 2405 1 Gd-S 526.8 ± 10.5 1 H-Ew 85.8 ± 2 1 I-Ti 361.2 ± 2 1 F	F–Lu	405 ± 19	1	Ga–Kr	4.08	1	H–Se	312.5	1	I–Nd	301.5	1
F-Mo 464 1 Ga-P 229.7 ± 12.6 1 H-Sr 164 ± 8 1 I-Pb 194 ± 38 1 F-Na 349 1 Ga-Sb 192.0 ± 12.6 1 H-T 440.49 1 I-Pr 306.2 1 F-Na 477.3 1 Ga-Te 265 ± 21 1 H-Te 270.7 ± 1.7 1 I-Rb 318.8 ± 2.1 1 F-Na 455.2 ± 12.6 1 Ga-Te 5.27 1 H-Ti 204.6 ± 8.8 1 I-Si 243.1 ± 8.4 1 F-Na 337.5 ± 9.9 2 Gd-Gd 206-G5 1 H-Ti 290.4 ± 4.8 1 I-Sin 231.8 ± 2.1 1 F-Np 430 ± 50 1 Gd-O 715 1 H-Py 183.1 ± 2.0 1 I-Sin 235.± 3 1 F-P 2405 1 Gd-S 526.8 ± 10.5 1 H-Ey 38.99 1 I-Ti 336.2 1 1	F-Mg	463	1	Ga–Li	133.1 ± 14.6	1	H–Si	293.3 ± 1.9	1	I–Ni	293 ± 21	1
F-N ≤349 1 Ga-Sb 192.0 ± 12.6 1 H-T 440.49 1 I-Pr 306.2 1 F-Na 477.3 1 Ga-Te 265 ± 21 1 H-Te 270.7 ± 1.7 1 I-Rb 318.8 ± 2.1 1 F-Nd 545.2 ± 12.6 1 Ga-Xe 5.27 1 H-Ti 204.6 ± 8.8 1 I-Si 243.1 ± 8.4 1 F-Ni 439.7 ± 5.9 2 Gd-Gd 206.3 ± 67.5 1 H-Ti 195.4 ± 4 1 I-Si 243.1 ± 8.4 1 F-Np 430. ± 50 1 Gd-G 233.8 1 H-Ti 195.4 ± 4 1 I-Si 235.1 1 F-Np 430. ± 50 1 Gd-Ti 333.8 1 H-Ti 195.4 ± 4 1 I-Si 301.1 1 F-P 2405 1 Gd-Si 526.8 ± 10.5 1 H-E-Hi 3.809 1 I-Ti 306.2 1 1 F-P-Hi </td <td>F-Mn</td> <td>445.2 ± 7.5</td> <td>1</td> <td>Ga–O</td> <td>374 ± 21</td> <td>1</td> <td>H–Sn</td> <td>264 ± 17</td> <td>1</td> <td>I–O</td> <td>233.4 ± 1.3</td> <td>12</td>	F-Mn	445.2 ± 7.5	1	Ga–O	374 ± 21	1	H–Sn	264 ± 17	1	I–O	233.4 ± 1.3	12
F-Na 477.3 1 Ga—Te 265 ± 21 1 H—Te 270.7 ± 1.7 1 I—Rb 318.8 ± 2.1 1 F-Nd 545.2 ± 12.6 1 Ga—Xe 5.27 1 H—Ti 204.6 ± 8.8 1 I—Si 243.1 ± 8.4 1 F-Ni 439.7 ± 5.9 2 Gd—Gd 206.3 ± 67.5 1 H—Ti 195.4 ± 4 1 I—Sm 293.1 1 F-Np 430 ± 50 1 Gd—G 715 1 H—V 209.3 ± 6.8 1 I—Sm 235 ± 3 1 F-O 220 1 Gd—G 715 1 H—V 183.1 ± 2.0 1 I—Sm 301 1 F-P 2405 1 Gd—Se 256.8 ± 10.5 1 H—E 8.8 ± 2 1 I—IFs 301 1 1 F—F 2405 1 Gd—Se 236.2 ± 1.5 1 HE—He 3.809 1 I—Th 361 ± 2.5 1 F—F 388	F-Mo	464	1	Ga–P	229.7 ± 12.6	1	H–Sr	164 ± 8	1	I–Pb	194 ± 38	1
F-Nd 545.2 ± 12.6 1 Ga-Xe 5.27 1 H-Ti 204.6 ± 8.8 1 I-Si 243.1 ± 8.4 1 F-Ni 439.7 ± 5.9 2 Gd-Gd 206.3 ± 67.5 1 H-TI 195.4 ± 4 1 I-Sm 293.1 1 F-Np 430 ± 50 1 Gd-I 333.8 1 H-V 209.3 ± 6.8 1 I-Sm 235 ± 3 1 F-O 220 1 Gd-O 715 1 H-Yb 183.1 ± 2.0 1 I-Sm 301 1 F-P 2405 1 Gd-Se 526.8 ± 10.5 1 H-Zn 85.8 ± 2 1 I-TB 336.2 1 I-FP 525 ± 46 1 Gd-Se 430 ± 15 1 He-He 3.809 1 I-TB 361 ± 25 1 F-Pr 582 ± 46 1 Ge-Ge 264.4 ± 6.8 1 He-Hg 3.8 1 I-TB 361 ± 25 1 F-Re 494 ± 21 1 Ge-H	F-N	≤349	1	Ga–Sb	192.0 ± 12.6	1	Н-Т	440.49	1	I–Pr	306.2	1
F-Ni 439.7 ± 5.9 2 Gd-Gd 206.3 ± 67.5 1 H-TI 195.4 ± 4 1 I-Sm 293.1 1 F-Np 430 ± 50 1 Gd-I 333.8 1 H-V 209.3 ± 6.8 1 I-Sm 235 ± 3 1 F-O 220 1 Gd-O 715 1 H-Yb 183.1 ± 2.0 1 I-Sm 301 1 F-P \$405 1 Gd-Se \$26.8 ± 10.5 1 H-Zn 85.8 ± 2 1 I-Tb 336.2 1 F-Pb \$355 ± 13 1 Gd-Se \$40 ± 15 1 He-He 3.809 1 I-Te 912 ± 42 1 F-Pr \$82 ± 46 1 Gd-Ge 264.4 ± 6.8 1 He-He 3.8 1 I-Th 361 ± 25 1 F-Pu \$38 ± 29 1 Ge-H 263.2 ± 4.8 1 He-Me 3.8 1 I-Ti 306 1 1 F-Ru	F–Na	477.3	1	Ga–Te	265 ± 21	1	Н-Те	270.7 ± 1.7	1	I–Rb	318.8 ± 2.1	1
F-Np 430 ± 50 1 Gd-I 333.8 1 H-V 209.3 ± 6.8 1 I-Sn 235 ± 3 1 F-O 220 1 Gd-O 715 1 H-Yb 183.1 ± 2.0 1 I-Sr 301 1 F-P \$405 1 Gd-Se 526.8 ± 10.5 1 H-Zn 85.8 ± 2 1 I-Tb 336.2 1 F-Pb 355 ± 13 1 Gd-Se 430 ± 15 1 He-He 3.809 1 I-Te 192 ± 42 1 F-Pr 582 ± 46 1 Gd-Te 341 ± 15 1 He-He 3.809 1 I-Th 361 ± 25 1 F-Pu 538 ± 29 1 Ge-Ge 264.4 ± 6.8 1 He-We 3.8 1 I-Ti 306 1 F-Ru 494 ± 21 1 Ge-Me 263.2 ± 4.8 1 He-We 3.8 1 I-Ti 306.3 1 F-Ru 402 <th< td=""><td>F-Nd</td><td>545.2 ± 12.6</td><td>1</td><td>Ga–Xe</td><td>5.27</td><td>1</td><td>H–Ti</td><td>204.6 ± 8.8</td><td>1</td><td>I–Si</td><td>243.1 ± 8.4</td><td>1</td></th<>	F-Nd	545.2 ± 12.6	1	Ga–Xe	5.27	1	H–Ti	204.6 ± 8.8	1	I–Si	243.1 ± 8.4	1
F-O 220 1 Gd-O 715 1 H-Yb 183.1 ± 2.0 1 I-Sr 301 1 F-P \$405 1 Gd-S 526.8 ± 10.5 1 H-Zn 85.8 ± 2 1 I-Tb 336.2 1 F-Pb 355 ± 13 1 Gd-Se 430 ± 15 1 He-He 3.809 1 I-Te 192 ± 42 1 F-Pr 582 ± 46 1 Gd-Te 341 ± 15 1 He-Hg 3.8 1 I-Th 361 ± 25 1 F-Pu 538 ± 29 1 Ge-Ge 264.4 ± 6.8 1 He-Wg 3.8 1 I-Th 361 ± 25 1 F-Ru 494 ± 21 1 Ge-Mg 263.2 ± 4.8 1 Hf-Mg 328 ± 58 1 I-Tl 306 1 F-Ru 402 1 Ge-M 263.2 ± 4.8 1 Hf-M 308 ± 58 1 I-Tl 285 ± 21 1 F-Su 343.5 ± 6.7 <td>F–Ni</td> <td>439.7 ± 5.9</td> <td>2</td> <td>Gd–Gd</td> <td>206.3 ± 67.5</td> <td>1</td> <td>H–Tl</td> <td>195.4 ± 4</td> <td>1</td> <td>I–Sm</td> <td>293.1</td> <td>1</td>	F–Ni	439.7 ± 5.9	2	Gd–Gd	206.3 ± 67.5	1	H–Tl	195.4 ± 4	1	I–Sm	293.1	1
F-P ≤405 1 Gd-S 526.8 ± 10.5 1 H-Zn 85.8 ± 2 1 I-Tb 336.2 1 F-Pb 355 ± 13 1 Gd-Se 430 ± 15 1 He-He 3.809 1 I-Te 192 ± 42 1 F-Pr 582 ± 46 1 Gd-Te 341 ± 15 1 He-He 3.8 1 I-Th 361 ± 25 1 F-Pu 538 ± 29 1 Ge-Ge 264.4 ± 6.8 1 He-He 3.8 1 I-Th 361 ± 25 1 F-Rb 494 ± 21 1 Ge-Ge 264.4 ± 6.8 1 Hf-Hf 328 ± 58 1 I-Th 360 1 F-Rb 494 ± 21 1 Ge-H 263.2 ± 4.8 1 Hf-Hf 328 ± 58 1 I-Th 260.8 F-Ru 402 1 Ge-M 268.2 ± 25 1 Hf-M 328 ± 58 1 I-Tm 260.8 F-S 343.5 ± 6.7 1	F-Np	430 ± 50	1	Gd–I	333.8	1	H–V	209.3 ± 6.8	1	I–Sn	235 ± 3	1
F-Pb 355 ± 13 1 Gd-Se 430 ± 15 1 He-He 3.809 1 I-Te 192 ± 42 1 F-Pr 582 ± 46 1 Gd-Te 341 ± 15 1 He-Hg 3.8 1 I-Th 361 ± 25 1 F-Pu 538 ± 29 1 Ge-Ge 264.4 ± 6.8 1 He-Mg 3.8 1 I-Th 306 1 F-Rb 494 ± 21 1 Ge-Hg 263.2 ± 4.8 1 Hf-Hf 328 ± 58 1 I-Th 285 ± 21 1 F-Ru 402 1 Ge-Hg 268 ± 25 1 Hf-Mg 328 ± 58 1 I-Tm 260.8 1 I-Th 285 ± 21 1 I-Th 260.8	F-O	220	1	Gd-O	715	1	H–Yb	183.1 ± 2.0	1	I–Sr	301	1
F-Pr 582 ± 46 1 Gd-Te 341 ± 15 1 He-Hg 3.8 1 I-Th 361 ± 25 1 F-Pu 538 ± 29 1 Ge-Ge 264.4 ± 6.8 1 He-Xe 3.8 1 I-Ti 306 1 F-Rb 494 ± 21 1 Ge-H 263.2 ± 4.8 1 Hf-Hf 328 ± 58 1 I-Ti 285 ± 21 1 F-Ru 402 1 Ge-I 268 ± 25 1 Hf-M 535 ± 30 1 I-Tm 260.8 1 F-S 343.5 ± 6.7 1 Ge-Ni 290.3 ± 10.9 1 Hf-O 801 ± 13 1 I-U 299 ± 27 1 F-Sb 439 ± 96 1 Ge-O 657.5 ± 4.6 4 Hg-Hg 8.10 ± 0.18 1 I-Xe 6.9 1 F-Sc 599.1 ± 13.4 1 Ge-Pb 145.3 ± 6.9 6 Hg-Hg 34.69 ± 0.96 1 I-Ye 422.6 ± 12.5 1 F	F-P	≤405	1	Gd–S	526.8 ± 10.5	1	H–Zn	85.8 ± 2	1	I–Tb	336.2	1
F-Pu 538 ± 29 1 Ge-Ge 264.4 ± 6.8 1 He-Xe 3.8 1 I-Ti 306 1 F-Rb 494 ± 21 1 Ge-H 263.2 ± 4.8 1 Hf-Hf 328 ± 58 1 I-TI 285 ± 21 1 F-Ru 402 1 Ge-I 268 ± 25 1 Hf-N 535 ± 30 1 I-Tm 260.8 1 F-S 343.5 ± 6.7 1 Ge-Ni 290.3 ± 10.9 1 Hf-O 801 ± 13 1 I-U 299 ± 27 1 F-Sb 439 ± 96 1 Ge-O 657.5 ± 4.6 4 Hg-Hg 8.10 ± 0.18 1 I-Xe ~6.9 1 F-Sc 599.1 ± 13.4 1 Ge-Pb 145.3 ± 6.9 6 Hg-I 34.69 ± 0.96 1 I-Y 422.6 ± 12.5 1 F-Se 339 ± 42 1 Ge-Pb 254.7 ± 10.5 1 Hg-K 8.8 1 I-Yb 257.3 1 F-Si 576.4 ± 17 1 Ge-S 534 ± 3 1 Hg-Kr 5.75 1 I-Zn 153.1 ± 6.3 1 F-Sn 565 1 Ge-Sc 270 ± 11 1 Hg-N 10.8 1 I-Zr 127 1 F-Sn 476 ± 8 1 Ge-Si 297 1 Hg-Na 10.8 1 In-In 82.0 ± 5.7 1 F-Sr 579.009 ± 0.108 1 Ge-Si 297 1 Hg-Na 10.8 1 In-In 82.0 ± 5.7 1 F-Ta 579.009 ± 0.108 1 Ge-Y 279 ± 11 1 Hg-Na 8.4 1 In-Li 92.5 ± 14.6 1 F-Ta 573 ± 13 1 Ge-Te 396.7 ± 3.3 1 Hg-Rb 8.4 1 In-O 346 ± 30 1 F-Tb 561 ± 42 1 Ge-Y 279 ± 11 1 Hg-S 217.3 ± 22.2 1 In-P 197.9 ± 8.4 1	F–Pb	355 ± 13	1	Gd–Se	430 ± 15	1	Не–Не	3.809	1	I–Te	192 ± 42	1
F-Rb 494 ± 21 1 $Ge-H$ 263.2 ± 4.8 1 $Hf-Hf$ 328 ± 58 1 $I-TI$ 285 ± 21 1 F-Ru 402 1 $Ge-H$ 268 ± 25 1 $Hf-N$ 535 ± 30 1 $I-TM$ 260.8 1 F-S 343.5 ± 6.7 1 $Ge-Ni$ 290.3 ± 10.9 1 $Hf-O$ 801 ± 13 1 $I-U$ 299 ± 27 1 F-Sb 439 ± 96 1 $Ge-O$ 657.5 ± 4.6 4 $Hg-Hg$ 8.10 ± 0.18 1 $I-Xe$ ~ 6.9 1 F-Sc 599.1 ± 13.4 1 $Ge-Ph$ 145.3 ± 6.9 6 $Hg-I$ 34.69 ± 0.96 1 $I-Xe$ ~ 6.9 1 F-Se 339 ± 42 1 $Ge-Ph$ 254.7 ± 10.5 1 $Hg-K$ 8.8 1 $I-Xe$ 257.3 1 F-Si 576.4 ± 17 1 $Ge-Se$ 234.7 ± 10.5 1 $Hg-K$ 5.75 1	F-Pr	582 ± 46	1	Gd–Te	341 ± 15	1	He–Hg	3.8	1	I–Th	361 ± 25	1
F-Ru 402 1 $Ge-I$ 268 ± 25 1 $Hf-N$ 535 ± 30 1 $I-Tm$ 260.8 1 F-S 343.5 ± 6.7 1 $Ge-Ni$ 290.3 ± 10.9 1 $Hf-O$ 801 ± 13 1 $I-U$ 299 ± 27 1 F-Sb 439 ± 96 1 $Ge-O$ 657.5 ± 4.6 4 $Hg-Hg$ 8.10 ± 0.18 1 $I-Xe$ ~ 6.9 1 F-Sc 599.1 ± 13.4 1 $Ge-Pb$ 145.3 ± 6.9 6 $Hg-I$ 34.69 ± 0.96 1 $I-Y$ 422.6 ± 12.5 1 F-Se 339 ± 42 1 $Ge-Pb$ 254.7 ± 10.5 1 $Hg-K$ 8.8 1 $I-Yb$ 257.3 1 F-Si 576.4 ± 17 1 $Ge-S$ 534 ± 3 1 $Hg-K$ 5.75 1 $I-Zn$ 153.1 ± 6.3 1 F-Si 565 1 $Ge-Se$ 270 ± 11 1 $Hg-Na$ 10.8 1 $In-In$ 82.0 ± 5.7 1 F-Si 538 1 $Ge-Se$	F–Pu	538 ± 29	1	Ge–Ge	264.4 ± 6.8	1	Не-Хе	3.8	1	I–Ti	306	1
F-S 343.5 ± 6.7 1 Ge-Ni 290.3 ± 10.9 1 Hf-O 801 ± 13 1 I-U 299 ± 27 1 F-Sb 439 ± 96 1 Ge-O 657.5 ± 4.6 4 Hg-Hg 8.10 ± 0.18 1 I-Xe ~6.9 1 F-Sc 599.1 ± 13.4 1 Ge-Pb 145.3 ± 6.9 6 Hg-I 34.69 ± 0.96 1 I-Y 422.6 ± 12.5 1 F-Se 339 ± 42 1 Ge-Pd 254.7 ± 10.5 1 Hg-K 8.8 1 I-Yb 257.3 1 F-Si 576.4 ± 17 1 Ge-S 534 ± 3 1 Hg-Kr 5.75 1 I-Zr 153.1 ± 6.3 1 F-Sm 565 1 Ge-Sc 270 ± 11 1 Hg-Li 13.16 ± 0.38 1 I-Zr 127 1 F-Sn 476 ± 8 1 Ge-Se 484.7 ± 1.7 1 Hg-Na 10.8 1 In-Kr 4.85 1 <t< td=""><td>F-Rb</td><td>494 ± 21</td><td>1</td><td>Ge–H</td><td>263.2 ± 4.8</td><td>1</td><td>Hf–Hf</td><td>328 ± 58</td><td>1</td><td>I–Tl</td><td>285 ± 21</td><td>1</td></t<>	F-Rb	494 ± 21	1	Ge–H	263.2 ± 4.8	1	Hf–Hf	328 ± 58	1	I–Tl	285 ± 21	1
F-Sb 439 ± 96 1 Ge-O 657.5 ± 4.6 4 Hg-Hg 8.10 ± 0.18 1 I-Xe ~ 6.9 1 F-Sc 599.1 ± 13.4 1 Ge-Pb 145.3 ± 6.9 6 Hg-I 34.69 ± 0.96 1 I-Y 422.6 ± 12.5 1 F-Se 339 ± 42 1 Ge-Pd 254.7 ± 10.5 1 Hg-K 8.8 1 I-Yb 257.3 1 F-Si 576.4 ± 17 1 Ge-S 534 ± 3 1 Hg-Kr 5.75 1 I-Zn 153.1 ± 6.3 1 F-Sm 565 1 Ge-Sc 270 ± 11 1 Hg-Li 13.16 ± 0.38 1 I-Zr 127 1 F-Sn 476 ± 8 1 Ge-Sc 484.7 ± 1.7 1 Hg-Na 10.8 1 In-In 82.0 ± 5.7 1 F-Sr 538 1 Ge-Si 297 1 Hg-Ne 4.14 1 In-Li 92.5 ± 14.6	F–Ru	402	1	Ge–I	268 ± 25	1	Hf–N	535 ± 30	1	I–Tm	260.8	1
F-Sc 599.1 ± 13.4 1 Ge-Pb 145.3 ± 6.9 6 Hg-I 34.69 ± 0.96 1 I-Y 422.6 ± 12.5 1 F-Se 339 ± 42 1 Ge-Pd 254.7 ± 10.5 1 Hg-K 8.8 1 I-Yb 257.3 1 F-Si 576.4 ± 17 1 Ge-S 534 ± 3 1 Hg-Kr 5.75 1 I-Zn 153.1 ± 6.3 1 F-Sm 565 1 Ge-Sc 270 ± 11 1 Hg-Li 13.16 ± 0.38 1 I-Zr 127 1 F-Sn 476 ± 8 1 Ge-Sc 484.7 ± 1.7 1 Hg-Na 10.8 1 In-In 82.0 ± 5.7 1 F-Sr 538 1 Ge-Si 297 1 Hg-Ne 4.14 1 In-Kr 4.85 1 F-Ta 579.009 ± 0.108 1 Ge-Sn 230.1 ± 13 1 Hg-O 269 1 In-Li 92.5 ± 14.6 1 F-Ta <td>F-S</td> <td>343.5 ± 6.7</td> <td>1</td> <td>Ge–Ni</td> <td>290.3 ± 10.9</td> <td>1</td> <td>Hf–O</td> <td>801 ± 13</td> <td>1</td> <td>I–U</td> <td>299 ± 27</td> <td>1</td>	F-S	343.5 ± 6.7	1	Ge–Ni	290.3 ± 10.9	1	Hf–O	801 ± 13	1	I–U	299 ± 27	1
F-Se 339 ± 42 1 Ge-Pd 254.7 ± 10.5 1 Hg-K 8.8 1 I-Yb 257.3 1 F-Si 576.4 ± 17 1 Ge-S 534 ± 3 1 Hg-Kr 5.75 1 I-Zn 153.1 ± 6.3 1 F-Sm 565 1 Ge-Sc 270 ± 11 1 Hg-Li 13.16 ± 0.38 1 I-Zr 127 1 F-Sn 476 ± 8 1 Ge-Se 484.7 ± 1.7 1 Hg-Na 10.8 1 In-In 82.0 ± 5.7 1 F-Sr 538 1 Ge-Si 297 1 Hg-Ne 4.14 1 In-Kr 4.85 1 F-T 579.009 ± 0.108 1 Ge-Sn 230.1 ± 13 1 Hg-O 269 1 In-Li 92.5 ± 14.6 1 F-Ta 573 ± 13 1 Ge-Te 396.7 ± 3.3 1 Hg-Rb 8.4 1 In-O 346 ± 30 1	F-Sb	439 ± 96	1	Ge–O	657.5 ± 4.6	4	Hg–Hg	8.10 ± 0.18	1	I–Xe	~6.9	1
F-Si 576.4 ± 17 1 Ge-S 534 ± 3 1 Hg-Kr 5.75 1 I-Zn 153.1 ± 6.3 1 F-Sm 565 1 Ge-Sc 270 ± 11 1 Hg-Li 13.16 ± 0.38 1 I-Zr 127 1 F-Sn 476 ± 8 1 Ge-Se 484.7 ± 1.7 1 Hg-Na 10.8 1 In-In 82.0 ± 5.7 1 F-Sr 538 1 Ge-Si 297 1 Hg-Ne 4.14 1 In-Kr 4.85 1 F-T 579.009 ± 0.108 1 Ge-Sn 230.1 ± 13 1 Hg-O 269 1 In-Li 92.5 ± 14.6 1 F-Ta 573 ± 13 1 Ge-Te 396.7 ± 3.3 1 Hg-Rb 8.4 1 In-O 346 ± 30 1 F-Tb 561 ± 42 1 Ge-Y 279 ± 11 1 Hg-S 217.3 ± 22.2 1 In-P 197.9 ± 8.4	F-Sc	599.1 ± 13.4	1	Ge–Pb	145.3 ± 6.9	6	Hg–I	34.69 ± 0.96	1	I–Y	422.6 ± 12.5	1
F-Sm 565 1 Ge-Sc 270 ± 11 1 Hg-Li 13.16 ± 0.38 1 I-Zr 127 1 F-Sn 476 ± 8 1 Ge-Se 484.7 ± 1.7 1 Hg-Na 10.8 1 In-In 82.0 ± 5.7 1 F-Sr 538 1 Ge-Si 297 1 Hg-Ne 4.14 1 In-Kr 4.85 1 F-T 579.009 ± 0.108 1 Ge-Sn 230.1 ± 13 1 Hg-O 269 1 In-Li 92.5 ± 14.6 1 F-Ta 573 ± 13 1 Ge-Te 396.7 ± 3.3 1 Hg-Rb 8.4 1 In-O 346 ± 30 1 F-Tb 561 ± 42 1 Ge-Y 279 ± 11 1 Hg-S 217.3 ± 22.2 1 In-P 197.9 ± 8.4 1	F–Se	339 ± 42	1	Ge–Pd	254.7 ± 10.5	1	Hg–K	8.8	1	I–Yb	257.3	1
F-Sn 476 ± 8 1 Ge-Se 484.7 ± 1.7 1 Hg-Na 10.8 1 In-In 82.0 ± 5.7 1 F-Sr 538 1 Ge-Si 297 1 Hg-Ne 4.14 1 In-Kr 4.85 1 F-T 579.009 ± 0.108 1 Ge-Sn 230.1 ± 13 1 Hg-O 269 1 In-Li 92.5 ± 14.6 1 F-Ta 573 ± 13 1 Ge-Te 396.7 ± 3.3 1 Hg-Rb 8.4 1 In-O 346 ± 30 1 F-Tb 561 ± 42 1 Ge-Y 279 ± 11 1 Hg-S 217.3 ± 22.2 1 In-P 197.9 ± 8.4 1	F–Si	576.4 ± 17	1	Ge–S	534 ± 3	1	Hg–Kr	5.75	1	I–Zn	153.1 ± 6.3	1
F-Sr 538 1 Ge-Si 297 1 Hg-Ne 4.14 1 In-Kr 4.85 1 F-T 579.009 ± 0.108 1 Ge-Sn 230.1 ± 13 1 Hg-O 269 1 In-Li 92.5 ± 14.6 1 F-Ta 573 ± 13 1 Ge-Te 396.7 ± 3.3 1 Hg-Rb 8.4 1 In-O 346 ± 30 1 F-Tb 561 ± 42 1 Ge-Y 279 ± 11 1 Hg-S 217.3 ± 22.2 1 In-P 197.9 ± 8.4 1	F–Sm	565	1	Ge–Sc	270 ± 11	1	Hg–Li	13.16 ± 0.38	1	I–Zr	127	1
F-T 579.009 ± 0.108 1 $Ge-Sn$ 230.1 ± 13 1 $Hg-O$ 269 1 $In-Li$ 92.5 ± 14.6 1 $F-Ta$ 573 ± 13 1 $Ge-Te$ 396.7 ± 3.3 1 $Hg-Rb$ 8.4 1 $In-O$ 346 ± 30 1 $F-Tb$ 561 ± 42 1 $Ge-Y$ 279 ± 11 1 $Hg-S$ 217.3 ± 22.2 1 $In-P$ 197.9 ± 8.4 1	F–Sn	476 ± 8	1	Ge–Se	484.7 ± 1.7	1	Hg–Na	10.8	1	In–In	82.0 ± 5.7	1
F-Ta 573 ± 13 1 Ge-Te 396.7 ± 3.3 1 Hg-Rb 8.4 1 In-O 346 ± 30 1 F-Tb 561 ± 42 1 Ge-Y 279 ± 11 1 Hg-S 217.3 ± 22.2 1 In-P 197.9 ± 8.4 1	F–Sr	538	1	Ge–Si	297	1	Hg–Ne	4.14	1	In–Kr	4.85	1
F-Tb 561 ± 42 1 Ge-Y 279 ± 11 1 Hg-S 217.3 ± 22.2 1 In-P 197.9 ± 8.4 1	F-T	579.009 ± 0.108	1	Ge–Sn	230.1 ± 13	1	Hg-O	269	1	In–Li	92.5 ± 14.6	1
	F–Ta	573 ± 13	1	Ge–Te	396.7 ± 3.3	1	Hg–Rb	8.4	1	In-O	346 ± 30	1
F-Th 652 1 H-H 435.7799 \pm 0.0001 1 Hg-Se 144.3 \pm 30.1 1 In-S 287.9 \pm 14.6 1	F-Tb	561 ± 42	1	Ge–Y	279 ± 11	1	Hg–S	217.3 ± 22.2	1	In-P	197.9 ± 8.4	1
	F–Th	652	1	Н–Н	435.7799 ± 0.0001	1	Hg–Se	144.3 ± 30.1	1	In-S	287.9 ± 14.6	1

A-B	$D^{o}_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	A-B	$D^{o}_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	A-B	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	A-B	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.
In–Sb	151.9 ± 10.5	1	Lr–O	665	1	Nd-Te	305 ± 15	1	O–Zr	766.1 ± 10.6	1
In-Se	245.2 ± 14.6	1	Lu–Lu	142 ± 33	1	Ne-Ne	4.070	1	Os–Os	415 ± 77	1
In-Te	215.5 ± 14.6	1	Lu–O	669	1	Ne-Xe	4.31	1	P-P	489.1	1
In-Xe	6.48	1	Lu–Pt	402 ± 34	1	Ne-Zn	3.92	1	P–Pt	≤416.7 ± 16.7	1
In-Zn	32.2	1	Lu–S	508.4 ± 14.4	1	Ni–Ni	204	1	P–Rh	353.1 ± 16.7	1
Ir–Ir	361 ± 68	1	Lu–Se	418 ± 15	1	Ni-O	366 ± 30	1	P-S	442 ± 10	1
Ir–La	577 ± 12	1	Lu-Te	325 ± 15	1	Ni–Pd	140.9	1	P-Sb	356.9 ± 4.2	1
Ir–Nb	465 ± 25	1	Md-O	418	1	Ni–Pt	273.7 ± 0.3	1	P–Se	363.7 ± 10.0	1
Ir–O	414 ± 42	1	Mg-Mg	11.3	1	Ni-S	356 ± 21	1	P–Si	363.6	1
Ir–Si	462.8 ± 21	1	Mg-Ne	~4.1	1	Ni–Si	318 ± 17	1	Р-Те	297.9 ± 10.0	1
Ir-Th	574 ± 42	1	Mg-O	358.2 ± 7.2	1	Ni-V	206.3 ± 0.2	1	P–Th	372 ± 29	1
Ir–Ti	422 ± 13	1	Mg-S	234	1	Ni-Y	283.92 ± 0.10	1	P-Tl	209 ± 13	1
Ir-Y	457 ± 15	1	Mg–Xe	9.70 ± 1.79	1	Ni–Zr	279.8 ± 0.1	1	P–U	293 ± 21	1
К-К	56.96	1	Mn–Mn	61.6 ± 9.6	1	No-O	268	1	P-W	305 ± 4	1
K–Kr	4.6	1	Mn-O	362 ± 25	1	Np-O	731	1	Pb-Pb	86.6 ± 0.8	1
K–Li	82.0 ± 4.2	1	Mn–S	301 ± 17	1	O-O	498.36 ± 0.17	1	Pb-S	398	1
K–Na	65.994 ± 0.008	1	Mn–Se	239.3 ± 9.2	1	O–Os	575	1	Pb–Sb	161.5 ± 10.5	1
K-Zn	6.5	1	Мо-Мо	435.5 ± 1.0	1	O-P	589	1	Pb–Se	302.9 ± 4.2	1
К-О	271.5 ± 12.6	1	Mo-Nb	452 ± 25	1	O–Pa	792	1	Pb–Si	168.8 ± 7.3	6
K–Rb	53.723 ± 0.005	1	Мо-О	502	1	O–Pb	382.4 ± 3.3	4	Pb-Te	249.8 ± 10.5	1
K–Xe	5.0	1	N-N	944.84 ± 0.10	1	O-Pd	238.1 ± 12.6	1	Pd–Pd	>136	1
Kr–Kr	5.39	1	N-O	631.62 ± 0.18	1	O–Pr	740	1	Pd–Pt	191.0	1
Kr–Li	~12.1	1	N-P	617.1 ± 20.9	1	O–Pt	418.6 ± 11.6	13	Pd-Si	261 ± 12	1
Kr–Mg	6.71 ± 0.96	1	N–Pt	374.2 ± 9.6	1	O–Pu	656.1	1	Pd-Y	241 ± 15	1
Kr–Na	~4.53	1	N–Pu	469 ± 63	1	O–Rb	276 ± 12.6	1	Po-Po	187	1
Kr–Ne	4.31	1	N–S	467 ± 24	1	O–Re	627 ± 84	1	Pr–Pr	129.1	1
Kr-O	<8	1	N-Sb	460 ± 84	1	O–Rh	405 ± 42	1	Pr–S	492.5 ± 4.6	1
Kr-Tl	4.14	1	N–Sc	464 ± 84	1	O–Ru	528 ± 42	1	Pr–Se	446.4 ± 23.0	1
Kr–Xe	5.66	1	N–Si	437.1 ± 9.9	1	O–S	517.90 ± 0.05	1	Pr–Te	326 ± 20	1
Kr–Zn	5.0	1	N–Ta	607 ± 84	1	O–Sb	434 ± 42	1	Pt–Pt	306.7 ± 1.9	1
La–La	244.9	1	N–Th	577 ± 33	1	O–Sc	671.4 ± 1.0	1	Pt–Si	501 ± 18	1
La–N	519 ± 42	1	N–Ti	476 ± 33	1	O–Se	429.7 ± 6.3	1	Pt–Th	551 ± 42	1
La–O	798	1	N–U	531 ± 21	1	O–Si	799.6 ± 13.4	1	Pt–Ti	397.5 ± 10.6	1
La–Pt	505 ± 12	1	N–V	523 ± 38	1	O–Sm	573	1	Pt-Y	474 ± 12	1
La–Rh	550 ± 12	1	N–Xe	26.9	1	O–Sn	528	1	Rb–Rb	48.898 ± 0.005	1
La–S	573.4 ± 1.7	1	N–Y	477 ± 63	1	O–Sr	426.3 ± 6.3	1	Re–Re	432 ± 30	1
La–Se	485.7 ± 14.6	1	N–Zr	565 ± 25	1	O-Ta	839	1	Rh–Rh	235.85 ± 0.05	1
La–Te	385.6 ± 15	1	Na–Na	74.805 ± 0.586	1	O-Tb	694	1	Rh–Sc	444 ± 11	1
La–Y	197 ± 21	1	Na–Ne	~3.8	1	O-Tc	548	1	Rh–Si	395.0 ± 18.0	1
Li–Li	105.0	1	Na-O	270 ± 4	1	O–Te	377 ± 21	1	Rh–Th	513 ± 21	1
Li–Mg	67.4 ± 6.3	1	Na-Rb	63.887 ± 0.024	1	O-Th	877	1	Rh–Ti	390.8 ± 14.6	1
Li–Na	87.181 ± 0.001	1	Na-Xe	~5.12	1	O-Ti	666.5 ± 5.6	1	Rh–U	519 ± 17	1
Li-O	340.5 ± 6.3	1	Nb-Nb	513	1	O–Tl O–Tm	213 ± 84	1	Rh–V	364 ± 29	1
Li–Pb Li–S	78.7 ± 8 312.5 ± 7.5	1	Nb–Ni Nb–O	271.9 ± 0.1 726.5 ± 10.6	$\frac{1}{1}$	O-IIII O-U	514 755	1 1	Rh–Y Ru–Ru	446 ± 11 193.0 ± 19.3	1 1
Li–Sb	169.0 ± 10.0	1	Nb-Ti	302.0 ± 0.1	1	0-V	637	1	Ru–Si	397.1 ± 21	1
Li–Si	149	1	Nb-V	369.3 ± 0.1	1	O-W	720 ± 71	1	Ru-Th	592 ± 42	
Li–Si Li–Sm	193.3 ± 18.8	1	Nd-Nd	82.8	1	O–W O–Xe	36.4	1	Ru–III Ru–V	414 ± 29	1
Li–3iii Li–Tm	276.1 ± 14.6	1	Nd-Nd Nd-O	703	1	O-Xe O-Y	714.1 ± 10.2	1	S–S	425.30	1
Li–Tiii Li–Xe	~12.1	1	Nd-S	471.5 ± 14.6	1	O-Yb	387.7 ± 10.2	1	S–Sb	378.7	1
Li–Yb	143.5 ± 12.6	1	Nd–Se	393.9	1	O–Zn	≤250	1	S–Sc	478.2 ± 12.6	1
2. 10	_ 10.0 _ 12.0	-	114 50	575.7	1			-	5 50	-, -, - I = I	-

A-B	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	А-В	$D^o_{~298}/{ m kJ~mol^{-1}}$	Ref.	А-В	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	А-В	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.
S–Se	371.1 ± 6.7	1	Sb–Tl	126.7 ± 10.5	1	Si-Te	429.2	3	Ti–Ti	117.6	1
S-Si	617 ± 5	1	Sc–Sc	163 ± 21	1	Si-Y	258 ± 17	1	Ti-V	203.2 ± 0.1	1
S-Sm	389	1	Sc–Se	385 ± 17	1	Sm-Sm	54 ± 21	1	Ti–Zr	214.3 ± 0.1	1
S–Sn	467	1	Sc–Si	227.2 ± 14	1	Sm-Te	272.4 ± 14.6	1	Tl-Tl	59.4	1
S–Sr	338.5 ± 16.7	1	Sc-Te	289 ± 17	1	Sn-Sn	187.1 ± 0.3	1	Tl–Xe	4.18	1
S-Ta	669.5 ± 13.5	1	Se–Se	330.5	1	Sn-Te	338.1 ± 6.3	1	Tm-Tm	54 ± 17	1
S-Tb	515 ± 42	1	Se–Si	538 ± 13	1	Sr–Sr	16.64 ± 1.12	1	U–U	222 ± 21	1
S-Te	335 ± 42	1	Se–Sm	331.0 ± 14.6	1	T-T	446.67	1	V–V	269.3 ± 0.1	1
S-Ti	418 ± 3	1	Se–Sn	401.2 ± 5.9	1	Та-Та	390 ± 96	1	V–Zr	260.6 ± 0.3	1
S-Tm	368 ± 21	1	Se–Sr	251.0 ± 12.6	1	Tb-Tb	138.8	1	W-W	666	1
S-U	528.4 ± 10.5	1	Se–Tb	423 ± 20	1	Tb-Te	339 ± 42	1	Xe-Xe	6.023	1
S-V	449.4 ± 14.6	1	Se-Te	293.3	1	Tc-Tc	330	1	Y-Y	\sim 270 ± 39	1
S-Y	528.4 ± 10.5	1	Se–Ti	381 ± 42	1	Те-Те	257.6 ± 4.1	1	Yb-Yb	16.3	1
S-Yb	167	1	Se-Tm	274 ± 40	1	Te-Ti	289 ± 17	1	Zn–Zn	22.2 ± 6.3	1
S-Zn	224.8 ± 12.6	1	Se–V	347 ± 21	1	Te-Tm	182 ± 40	1	Zr–Zr	298.2 ± 0.1	1
S–Zr	572.0 ± 11.6	1	Se–Y	435 ± 13	1	Te-Y	339 ± 13	1			
Sb-Sb	301.7 ± 6.3	1	Se–Zn	170.7 ± 25.9	1	Te-Zn	117.6 ± 18.0	1			
Sb-Te	277.4 ± 3.8	1	Si–Si	310	1	Th-Th	≤289 ± 33	1			

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TABLE 2. Enthalpy of Formation of Gaseous Atoms

Atom	$\Delta_{\mathcal{H}}^{o}_{298}/\mathrm{kJ}\;\mathrm{mol}^{-1}$	Ref.	Atom	$\Delta H_{298}^o/\text{kJ mol}^{-1}$	Ref.	Atom	$\Delta H_{298}^o/\text{kJ mol}^{-1}$	Ref.	Atom	$\Delta_{f}H^{o}_{298}/\text{kJ mol}^{-1}$	Ref.
Ac	406	5	Cr	397.48 ± 4.2	3	La	431.0 ± 2.1	4	Pu	345	6
Ag	284.9 ± 0.8	2	Cs	76.5 ± 1.0	2	Li	159.3 ± 1.0	2	Ra	159	5
Al	330.9 ± 4.0	2	Cu	337.4 ± 1.2	2	Lu	427.6 ± 2.1	4	Rb	80.9 ± 0.8	2
Am	284	6	Dy	290.4 ± 2.1	4	Mg	147.1 ± 0.8	2	Re	774 ± 6.3	1
As	302.5 ± 13	1	Er	316.4 ± 2.1	4	Mn	283.3 ± 4.2	3	Rh	556 ± 4	1
Au	368.2 ± 2.1	1	Es	133	6	Mo	658.98 ± 3.8	3	Ru	650.6 ± 6.3	1
В	565 ± 5	2	Eu	177.4 ± 2.1	4	N	472.68 ± 0.40	2	S	277.17 ± 0.15	2
Ba	179.1 ± 5.0	3	F	79.38 ± 0.30	2	Na	107.5 ± 0.7	3	Sb	264.4 ± 2.5	1
Be	324 ± 5	2	Fe	415.5 ± 1.3	3	Nb	733.0 ± 8	3	Sc	377.8 ± 4	1
Bi	209.6 ± 2.1	1	Ga	271.96 ± 2.1	3	Nd	326.9 ± 2.1	4	Se	227.2 ± 4	1
Bk	310	6	Gd	397.5 ± 2.1	4	Ni	430.1 ± 8.4	3	Si	450.0 ± 8	2
Br	111.87 ± 0.12	3	Ge	372 ± 3	2	Np	464.8	6	Sm	206.7 ± 2.1	4
C	716.68 ± 0.45	2	Н	217.998 ± 0.006	2	О	249.229 ± 0.002	7	Sn	301.2 ± 1.5	2
Ca	177.8 ± 0.8	2	Hf	618.4 ± 6.3	3	Os	787 ± 6.3	1	Sr	164.0 ± 1.7	3
Cd	111.80 ± 0.20	2	Hg	61.38 ± 0.04	2	P	316.5 ± 1.0	2	Ta	782.0 ± 2.5	1
Ce	420.1 ± 2.1	4	Но	300.6 ± 2.1	4	Pa	563	5	Tb	388.7 ± 2.1	4
Cf	196	6	I	106.76 ± 0.04	2	Pb	195.2 ± 0.8	2	Tc	678	5
Cl	121.301 ± 0.008	2	In	243 ± 4	1	Pd	376.6 ± 2.1	1	Te	196.6 ± 2.1	1
Cm	386	6	Ir	669 ± 4	1	Pr	356.9 ± 2.1	4	Th	602 ± 6	2
Co	426.7	3	K	89.0 ± 0.8	2	Pt	565.7 ± 1.3	1	Ti	473 ± 3	2

Atom	$\Delta_f H^o_{298}$ /kJ mol ⁻¹	Ref.	Atom	$\Delta_{f}H^{o}_{298}/\mathrm{kJ}\;\mathrm{mol}^{-1}$	Ref.	Atom	$\Delta_f H^o_{298}/\text{kJ mol}^{-1}$	Ref.	Atom	$\Delta_{f}H^{o}_{298}/\mathrm{kJ}\;\mathrm{mol}^{-1}$	Ref.
Tl	182.2 ± 0.4	1	U	533 ± 8	2	W	851.0 ± 6.3	3	Yb	155.6 ± 2.1	4
Tm	232.2 ± 2.1	4	V	515.5 ± 8	3	Y	424.7 ± 2.1	4	Zn	130.40 ± 0.40	2
									Zr	610.0 ± 8.4	3

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TABLE 3. Bond Dissociation Energies in Polyatomic Molecules

The D_{298}° values in polyatomic molecules are notoriously difficult to measure accurately since the mechanism of the kinetic systems involved in many of the measurements are seldom straightforward. Thus, much lively controversy has taken place in the literature and is likely to continue for some time to come. We will continue updating and presenting our assessment of the most reliable BDE data every year.

The references relating to each of the D_{298}^{o} values listed in Table 3 are contained in the *Comprehensive Handbook of Chemical Bond Energies*, by Yu-Ran Luo, CRC Press, 2007. Many D_{298}^{o} in Table 3 are derived from the equation

$$D^o_{298}(\text{R-X}) = \Delta_f H^o(\text{R}) + \Delta_f H^o(\text{X}) - \Delta_f H^o(\text{RX})$$

Here, the enthalpies of formation of the atoms and radicals are taken from Tables 2 and 4, respectively, and the enthalpies of formation of the molecules are from reference sources listed in the above *Comprehensive Handbook of Chemical Bond Energies*.

Table 3 presents H-C, C-C, C-halogen, O-, N-, S-, Si-, Ge-, Sn-, Pb-, P-, As-, Sb-, Bi-, Se-, Te-, and metal-X BDEs. The boldface in the species indicates the dissociated fragment. The metal-X BDEs are arranged on the basis of the Periodic Table with the new IUPAC notation for Groups 1 to 18, see inside front cover of this *Handbook*.

Bond	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	Bond	$D^{o}_{298}/\mathrm{kJ}~\mathrm{mol}^{-1}$	Ref.	Bond	$D^o_{298}/\mathrm{kJ}~\mathrm{mol}^{-1}$	Ref.
(1) C-H BDEs			CH_2 = $CHCCCH_2$ - H	363.3	1	H-cyclo-C ₅ H ₉	400.0 ± 4.2	1
` '	439.3 ± 0.4	1	CH ₃ CCCH ₂ CH ₃	365.3 ± 9.6	1	H-cyclo-C ₆ H ₁₁	416.3	1
CH ₃ -H			HCCCH,CH,CH3	349.8 ± 8.4	1	H-C ₆ H ₅	472.2 ± 2.2	1
CH ₃ CH ₂ -H	420.5 ± 1.3	1	HCCCH(CH ₃),	345.2 ± 8.4	1	H-CH ₂ C ₆ H ₅	375.5 ± 5.0	1
CH ₃ CH ₂ CH ₂ - H	422.2 ± 2.1	1	CH ₂ CCC H (CH ₂) ₂	344.3 ± 11.3	1	H-CH(CH ₃)C ₆ H ₅	357.3 ± 6.3	1
$CH_3CH_2CH_3$	410.5 ± 2.9	1	HCCCCCC-H	~543 ± 13	1	H-CH(C,H,)	353.5 ± 2.1	1
$CH_{3}CH_{2}CH_{2}CH_{2}$	421.3	1	H_C=CH- H	464.2 ± 2.5	1	H-CH(C ₆ H ₄ -p-OH) ₂	375.8 ± 4.7	1
CH ₃ CH ₂ CH ₂ CH ₃	411.1 ± 2.2	1	CH ₂ =C=CH -H	371.1 ± 12.6	1	H-C(CH ₂) ₂ C ₆ H ₅	348.1 ± 4.2	1
$(CH_3)_2CHCH_2$ - H	419.2 ± 4.2	1	CH ₂ CH=CH- H	464.8	1	\mathbf{H} $-\mathbf{C}(\mathbf{C}_{6}\mathbf{H}_{5})_{3}$	338.9 ± 8.4	1
$(CH_3)_3C-\mathbf{H}$	400.4 ± 2.9	1	CH ₂ =CHCH ₂ - H	369 ± 3	1	1-H-C, H,	469.4 ± 5.4	1
$(CH_3)_3CCH_2$ - H	419.7 ± 4.2	1	2 2	410.5		10 /		
(CH ₃ CH ₂)CH(CH ₃) ₂	400.8	1	CH ₂ =CH-CH ₂ CH ₂ -H		1	2- H -C ₁₀ H ₇	468.2 ± 5.9	1
CH ₃ CH ₂ (CH ₂) ₂ CH ₃	415.1	1	CH_2 = $CHCH_2CH_3$	350.6	1	H-CF ₃	445.2 ± 2.9	1
(C,H,)CH(CH,)	396.2 ± 8.4	1	$CH_2 = C(CH_3)CH_2 - H$	372.8	1	H-CHF ₂	431.8 ± 4.2	1
CH ₂ CH(CH ₂)CH(CH ₂)	399.2 ± 13.0	1	CH ₂ =CHCH=CHCH ₂ -H	347.3 ± 12.6	1	H –CH ₂ F	423.8 ± 4.2	1
CH ₃ CH ₂ (CH ₂) ₃ CH ₃	410	1	$(CH_2=CH)_2CH-H$	320.5 ± 4.2	1	H-CClF ₂	421.3 ± 8.4	1
CH ₂ CH ₂ (CH ₂) ₄ CH ₃	410	1	CH ₂ =CHCH ₂ CH ₂ CH ₃	348.8	1	H-CCl ₂ F	410.9 ± 8.4	1
HCC-H	557.81 ± 0.30	1	CH ₂ =CHCH(CH ₃) ₂	332.6 ± 7.1	1	H-CBrF ₂	415.5 ± 12.6	1
			CH,=C(CH,CH,)CH,-H	356.1 ± 8.4	1	H-CHClF	421.7 ± 10.0	1
HCCCC-H	539 ± 12	1	$(CH_2=CH)_2C(CH_2)-H$	322.2	1	H-CCl ₃	392.5 ± 2.5	1
CHCCH ₂ -H	384.1 ± 4.2	1	H-cyclo-C ₂ H ₅	444.8 ± 1.0	1	H-CHCl,	400.6 ± 2.0	1
CH ₃ CCCH ₂ -H	379.5	1	H-CH ₂ -cyclo-C ₂ H ₅	407.5 ± 6.7	1	H-CH,Cl	419.0 ± 2.3	1
HCCCH ₂ CH ₃	373.0	1	H-cyclo-C ₄ H ₇	407.3 ± 0.7 409.2 ± 1.3	1	H–CFClBr	413 ± 21	1
			11-cyclo-C ₄ 11 ₇	TU 7.2 ± 1.3	1	11 01 0151	110 - 21	1

Bond	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	Bond	$D^o_{298}/\mathrm{kJ}\ \mathrm{mol}^{-1}$	Ref.	Bond	$D^o_{298}/{ m kJ\ mol^{-1}}$	Ref.
H–CHClBr	406.0 ± 2.4	1	(C H ,OH),	385.3	1	Me,CHC(O)OEt	387.4	1
H-CCl ₂ Br	387 ± 21	1	HOCH ₂ (CH ₂) ₂			PhCHMe(C(O)OEt)	358.2	1
H–CClBr ₂	371 ± 21	1	(OH)CH –H	399.2	1	H-furaylmethyl	361.9 ± 8.4	1
H-CBr ₂	399.2 ± 8.4	1	CH ₃ OCH ₃	402.1	1	CH ₃ NH ₃	392.9 ± 8.4	1
H-CHBr ₂	412.6 ± 2.7	3	CHF ₂ OCF ₃	443.5 ± 4.2	1	CH ₃ N=CH ₂	407.9 ± 14.6	1
H-CH ₂ Br	427.2 ± 2.4	1	CHF,OCHF,	435.1 ± 4.2	1	CH ₃ CH ₂ NH,	377.0 ± 8.4	1
H-CI,	423 ± 29	1	CH ₃ OCF ₃	426.8 ± 4.2	1	C ₂ H ₅ CH ₂ NH ₂	380.7 ± 8.4	1
H-CHI,	431.0 ± 8.4	1	CH ₃ OCH ₂ CH ₃	389.1	1	C ₃ H ₇ CH ₂ NH ₂	393.3 ± 8.4	1
H-CH ₂ I	431.6 ± 2.8	1	(CH ₃) ₃ COC(CH ₃) ₃	402.1	1	$C_4H_9CH_2NH_2$	387.7 ± 8.4	1
CF ₃ CF ₂ -H	429.7 ± 2.1	1	CH ₃ CH ₂ OCH ₂ CH ₃	389.1	1	HOCH ₂ CH ₂ NH ₂	379.5 ± 8.4	1
CHF,CF,- H	431.0 ± 18.8	1	CH ₃ CH ₂ Ot-C(CH ₃) ₃	405.4	1	(CH ₃ CH ₂) ₂ NH	370.7 ± 8.4	1
CH,FCF,- H	433.0 ± 14.6	1	C H ₃OPh	385.0	1	$(C_3H_7CH_2)_2NH$	379.9 ± 8.4	1
CHF,CFH- H	426.8 ± 14.6	1	H-2-oxiran-2-yl	420.5 ± 6.5	1	$(C_4H_9CH_2)_2NH$	384.5 ± 8.4	1
CF ₃ CH ₂ -H	446.4 ± 4.5	1	H -tetrahydrofuran-2-yl	385.3 ± 6.7	1	$(C_2H_5)_2NCH_2CH_3$	379.5 ± 1.7	1
CH ₂ CF ₂ -H	416.3 ± 4.2	1	HC(O)- H	368.40 ± 0.67	1	$(C_2H_5CH_2)_3N$	376.6 ± 8.4	1
CH ₃ CF ₂ H CH ₂ FCHF -H	413.4 ± 12.6	1	FC(O)-H	423.0	1	((CH ₃) ₂ CCH ₂) ₃ N	388.3 ± 8.4	1
CHF ₂ CH ₂ -H	433.0 ± 14.6	1	CH ₃ C(O)-H	374.0 ± 1.3	1	(Bu) ₂ NCH ₂ (nPr)	381 ± 10.0	1
CH ₂ FCH ₂ -H	433.5 ± 8.4	1	CF ₃ C(O)-H	390.4	1	((CH ₃) ₂ CH) ₃ N	387.0 ± 8.4	1
CH ₃ CHF- H	439.9 ± 8.4 410.9 ± 8.4	1	$C_2H_5C(O)-H$	374.5	1	(CH ₃) ₂ CHNH ₂	372.0 ± 8.4	1
CF ₃ CHCl -H	425.9 ± 6.3	1	CH ₂ =CHC(O)– H	372.8	1	CH ₃ NHCH ₂	364.0 ± 8.4	1
CF ₃ CClBr –H	423.9 ± 6.3 404.2 ± 6.3	1	$C_3H_7C(O)-H$	371.2	1	(CH ₃) ₃ N	380.7 ± 8.4	1
CClF,CHF–H	404.2 ± 0.3 412.1 ± 2.1	1	iso-C ₂ H ₂ C(O)- H	364.5	1	tert-BuN(CH ₂)	376.6 ± 8.4	1
CCl ₃ CCl ₂ -H	397.5 ± 8.4	1	C,H,C(O)-H	372.0	1	((HOCH ₂ CH ₃) ₂ (CH ₃))N	364.4 ± 8.4	1
	397.3 ± 8.4 393.3 ± 8.4	1	(CH ₃),CHCH,C(O)- H	362.5	1	(HOCH ₂ CH ₂) ₂ (CH ₃))N	379.9 ± 8.4	1
CHCl ₂ CCl ₂ – H CH ₃ CCl ₂ – H	397.9 ± 5.0	1	C,H,CH(CH,)C(O)-H	360.8	1	((HOCH ₂)CH(CH ₃)) ₃ N	379.9 ± 8.4	1
CH ₃ CHCl- H	406.6 ± 1.5	1	tert-BuC(O) –H	375.1	1	PhCH ₂ NH ₂	368.2	1
CH,ClCH,- H	400.0 ± 1.3 423.1 ± 2.4	1	Et,CHC(O)-H	367.2	1	PhN(CH ₂ CH ₃) ₂	383.3 ± 4.2	1
CH ₃ CBr ₂ - H	397.1 ± 5.0	1	CH ₃ (CH ₂) ₈ C(O)– H	373.3	1	Ph ₂ NCH ₃	379.5 ± 1.7	1
CH ₃ CH ₂ -H CH ₃ BrCH ₃ -H	415.1 ± 8.4	1	C ₆ H ₅ C(O)– H	371.1 ± 10.9	1	PhN(CH ₂ Ph),	377.3 ± 1.7 357.3 ± 8.8	1
CH ₂ CHBr –H	415.0 ± 2.7	3	PhCH ₂ C(O)– H	362.0	1	$N(CH_{2}Ph)_{3}$	377.3 ± 3.8 372.8 ± 2.5	1
CF ₂ =CF- H	464.4 ± 8.4	1	PhC(CH ₃) ₂ C(O)– H	362.9	1	$PhN(CH_2CH=CH_2)_2$	372.8 ± 2.9 339.3 ± 2.9	1
CF ₂ CF ₂ CF ₂ - H	432.2	1	H-CH=C=O	448.1	1	$N(CH_2CH=CH_2)_3$	345.6 ± 3.3	1
CH ₃ CH ₂ CH ₂ CHCl -H	407.0 ± 3.5	1	CH ₃ C(O)H	394.5 ± 9.2	1	H ₂ NNH(CH ₃)	410	1
CH ₂ =CH-CHF- H	370.7 ± 4.6	1	CH ₃ C(O)Cl	≤423.4	1	$HNN(CH_3)_2$	410	1
CH ₂ =CHCHCl- H	370.7 ± 4.6 370.7 ± 4.6	1	CH ₃ CH ₂ C(O)H	383.7	1	$(CH_3)_2NC_6H_5$	383.7 ± 5.4	1
CH ₂ =CHCHBr-H	374.0 ± 4.6	1	CH ₃ COCH ₃	401.2 ± 2.9	1	H-CN	528.5 ± 0.8	1
$H-C_6F_5$	487.4	1	CF ₃ C(O)CH ₃	465.6	1	CH ₃ CN	405.8 ± 4.2	1
H-CH ₂ OH	401.92 ± 0.63	1	CH ₃ COCH ₂ CH ₃	403.8	1	CH ₃ CH ₂ CN	393.3 ± 12.6	1
CH ₂ CHOH	467 ± 11	1	$MeCOCH_{2}Me$	386.2 ± 7.1	1	PhCH ₂ CN	344.3	1
CH ₃ CH ₂ OH	401.2 ± 4.2	1	EtCOC H ₂ Me	396.5 ± 2.8	1	C _s F _s CH _s CN	350.6	1
CH ₃ CH ₂ OH	421.7 ± 8	1	CH ₃ CH ₂ COC ₆ H ₅	402.8 ± 3.6	1	CH ₂ (CN) ₂	366.5	1
CH ₃ CH ₂ CH ₂ OH	392	1	MeCH ₂ COPh	388.7	1	$CH_2(CN)(NH_2)$	355.2	1
CH ₃ CH ₂ CH ₂ OH	394.6 ± 8.4	1	H-C(O)OH	404.2	1	(CH ₃) ₂ CHCN	384.5	1
CH ₃ CH ₂ CH ₂ OH	406.3 ± 8.4	1	CH ₃ C(O)OH	398.7 ± 12.1	1	CH ₃ NC	389.1 ± 12.6	1
(CH ₃) ₂ C H OH	383.7 ± 8.4	1	ClCH ₂ C(O)OH	398.9	1	H-HCNN	405.8 ± 8.4	1
$(CH_3)_2CHOH$	394.6 ± 8.4	1	H-C(O)OCH ₃	399.2 ± 8.4	1	H-CNN	331 ± 17	1
CH ₂ =CHCH ₂ OH	341.4 ± 7.5	1	CH ₃ C(O)OCH ₃	406.3 ± 10.5	1	CH ₃ NO ₂	415.4	1
$(CH_3)_3COH$	418.4 ± 8.4	1	CH ₃ C(O)OCH ₃	404.6	1	CH ₃ CH ₂ NO ₂	410.5	1
(CH ₂ =CH) ₂ CHOH	288.7	1	CH ₃ C(O)OCH ₂ CH ₃	401.7	1	C,H,CH,NO,	410.5	1
Ph ₂ C H OH	326	1	CH₃C(O)OPh	419.2 ± 5.4	1	Me ₂ CHNO ₂	394.9	1
CH ₃ C H (OH) ₂	~385	1	CH ₃ CH ₂ C(O)OEt	400	1	C ₆ H ₅ C(NO ₂)C H CH ₃	357.3	1
3 \ 1/2		-	PhCH ₂ C(O)OEt	370.7	1	3		

Bond	$D^{o}_{298}/\mathrm{kJ}\ \mathrm{mol}^{-1}$	Ref.	Bond	$D^{o}_{298}/\mathrm{kJ}\ \mathrm{mol}^{-1}$	Ref.	Bond	$D^o_{298}/\mathrm{kJ}~\mathrm{mol}^{-1}$	Ref.
H –C(S)H	399.6 ± 5.0	1	CH ₂ -CHCH ₃	426.3 ± 6.3	1	CCl,-CH,Cl	323.8 ± 8.4	1
CH ₃ SH	392.9 ± 8.4	1	CH ₂ -CH=CCH ₂	359.8 ± 5.9	1	CCl ₂ -CH ₂	362.3 ± 6.3	1
CH,SCH,	392.0 ± 5.9	1	CH ₂ -cyclopro-en-1-yl	340.6 ± 20.9	1	CHCl,-CHCl,	326.9 ± 4.1	1
PhSCH ₂	389.1	1	CH ₃ -CH ₂ CH=CH ₂	317.6 ± 3.8	1	CHCl ₂ -CH ₂ Cl	352.2 ± 5.9	1
PhCH ₂ SPh	352.3	1	CH ₃ -CH ₂ C(CH ₃)=CH ₂	310.0 ± 4.2	1	CHCl ₂ -CH ₃	361.3 ± 2.5	1
(PhS) ₂ C H Ph	341.0	1	CH ₃ -CH(CH ₃)CH=CH ₂	302.5 ± 6.3	1	CHBrCl-CH,	384.5	1
PhSCHPh ₂	344.8	1	CH ₃ -C(CH ₃) ₂ CH=CH ₂	282.4 ± 6.3	1	CHClBr-CHClBr	317.1 ± 12.6	1
CH ₃ SOCH ₃	393.3	1	CH ₂ -cyclo-C ₅ H ₇	299.2 ± 8.4	1	CH,Cl-CH,Cl	360.7 ± 8.4	1
CH ₃ SO ₂ CH ₃	414.2	1	CH ₃ -C ₆ H ₅	426.8 ± 4.2	1	CH,Cl-CH,	375.7 ± 9.2	1
CH ₃ SO ₂ CF ₃	431.0	1	HCC-C ₆ H ₅	590.8 ± 5.9	1	Br ₂ C-CH ₂	356.9 ± 12.6	1
CH ₃ SO ₂ Ph	414.2	1	$C_3H_3-C_6H_5$	482.0 ± 5.4	1	Br ₃ C-CBr ₂	278.7 ± 16.7	1
PhCH ₂ SO ₂ Me	380.7	1	CH ₃ -CH ₂ C ₆ H ₅	325.1 ± 4.2	1	CHBr ₂ -CH ₃	372.8	1
PhCH ₂ SO ₂ CF ₃	372.4	1	CH ₃ -CH(CH ₃)C ₆ H ₅	318.8 ± 8.4	1	CH ₂ Br-CH ₂ Cl	378.2	1
PhCH ₂ SO ₂ tBu	376.6	1	CH ₃ -C(CH ₃) ₂ C ₆ H ₅	303.3 ± 8.4	1	CH ₂ Br-CH ₂ Br	379.9 ± 8.4	1
Ph,CHSO,Ph	365.3	1	CH ₃ -CH ₂ CHCHPh	295.4	1	CH ₂ I-CH ₂ I	387.0 ± 0.4 387.0 ± 10.5	1
$CH_2(SPh)_2$	372.4	1	CH_3 - $CH(C_6H_5)_2$	315.9 ± 6.3	1	CH ₃ -CH ₃ Br	381.6 ± 8.4	1
H-CH ₂ SiMe ₃	418 ± 6.3	1	0 0 2	290.8 ± 8.4	1	CH ₃ -CH ₂ I		1
H-CH ₂ C(CH ₃) ₂ SiMe ₃	409 ± 5	1	$CH_3-C(CH_3)(C_6H_5)_2$		1	3 2	384.5 ± 8.4	1
2 32 3	410.1	1	CH CH CH	478.6 ± 6.3		CF ₃ -CF ₂ CF ₃	424.3 ± 13.6	
H-CH ₂ SiMe ₂ Ph			C ₆ H ₅ -CH ₂ C ₆ H ₅	383.7 ± 8.4	1	CF ₃ -CF=CF ₂	420.5	1
H-CH((CH ₃) ₃ Si) ₂	397 ± 13	1	C ₆ H ₅ CH ₂ -CH ₂ C ₆ H ₅	272.8 ± 9.2	1	CH ₃ -CH ₂ CH ₂ Cl	371.4 ± 2.8	1
H-CH ₂ B(RO) ₂	412.5	1	$\mathbf{C}_{6}\mathbf{H}_{5}$ - $\mathbf{C}\mathbf{H}(\mathbf{C}_{6}\mathbf{H}_{5})_{2}$	361.1 ± 8.4	1	CH ₃ -CHClCH ₃	367.5 ± 2.0	1
\mathbf{H} - $\mathbf{CH}((\mathbf{CH}_3)_2\mathbf{P})_2$	385 ± 13	1	$\mathbf{C}_{6}\mathbf{H}_{5}-\mathbf{C}(\mathbf{C}_{6}\mathbf{H}_{5})_{3}$	324.3 ± 12.6	1	CH ₂ Cl-CHClCH ₃	356.5 ± 8.4	1
(2) C-C BDEs			Ph ₂ CH-CHPh ₂	247.3 ± 8.4	1	CH ₂ Cl-CH ₂ CClH ₂	369.0 ± 8.4	1
CH ₃ -CH ₃	377.4 ± 0.8	1	PhCH ₂ -CPh ₃	234.7 ± 14.6	1	CH ₃ -CCl ₂ CH ₃	362.8 ± 8.4	1
CH ₃ -C ₂ H ₅	370.3 ± 2.1	1	R- R, π-dimer, R =	42	1	CH ₂ Br-CHBrCH ₃	369.4 ± 8.4	1
CH ₃ -C ₃ H ₇	372.0 ± 2.9	1	phenalenyl			CH ₂ ClCH ₂ -CHClCH ₃	364.4 ± 8.4	1
CH ₃ -iso-C ₃ H ₇	369.0 ± 3.8	1	R -R, σ-dimer, R = phenalenyl	42.7	1	CH ₂ ClCH ₂ -CH ₂ CClH ₂	369.0 ± 8.4	1
CH ₃ -C ₄ H ₉	371.5 ± 2.9	1	R -R, R = 9-			CH₃CHBr –CHBrCH ₃	355.6 ± 8.4	1
CH ₃ -iso-C ₄ H ₉	370.3 ± 4.6	1	phenylfluorenyl	63.6	1	$\mathbf{CF_3} - \mathbf{C_6} \mathbf{H_5}$	463.2 ± 12.6	1
CH ₃ -sec-C ₄ H ₉	368.2 ± 2.9	1	CF ₃ -CF ₃	413.0 ± 5.0	1	CCl ₃ -C ₆ H ₅	388.7 ± 8.4	1
CH ₃ -tert-C ₄ H ₉	363.6 ± 2.9	1	CF ₃ -CHF ₂	399.6 ± 8.4	1	$\mathbf{CH_3}$ - $\mathbf{C_6F_5}$	439.3	1
$CH_3 - C_5H_{11}$	368.4 ± 6.3	1	CF ₃ -CClF ₂	373.6 ± 12.5	1	$\mathbf{CF_3}$ - $\mathbf{C_6F_5}$	435.1	1
$\mathbf{CH_3} - \mathbf{CH}(\mathbf{C_2H_5})_2$	365.7 ± 4.2	1	CF ₃ -CH ₂ F	397.5 ± 8.4	1	CF ₃ -CH ₂ C ₆ H ₅	365.7 ± 12.6	1
CH_3 $CH(C_2H_5)_2$ CH_3 $-C(CH_3)_2(CH_2CH_3)$	360.9 ± 6.3	1	CF ₃ -CCl ₃	332.2 ± 5.4	1	$C_6F_5-C_6F_5$	488.3	1
$\mathbf{CH_3} = \mathbf{C}(\mathbf{CH_3})_2(\mathbf{CH_2}\mathbf{CH_3})$ $\mathbf{CH_3} = \mathbf{C}_{\epsilon}\mathbf{H}_{13}$	368.2 ± 6.3	1	CF ₃ -CHBrCl	377.0 ± 10.5	1	CF ₃ -CHPh ₂	352.3 ± 16.7	1
$C_{2}H_{5}-C_{2}H_{5}$	363.2 ± 0.5 363.2 ± 2.5	1	CF ₃ -CH ₂ Br	399.6 ± 8.4	1	CF ₃ -CPh ₃	290.8 ± 16.7	1
C_2H_5 C_2H_5 C_3H_7 - C_3H_7	366.1 ± 3.3	1	CF ₃ -CH ₂ I	408.4 ± 10.5	1	CF ₂ CF-CFCF ₂	558.1 ± 12.6	1
iso - C_3H_7 - iso - C_3H_7	353.5 ± 4.6	1	CF ₃ -CH ₃	429.3 ± 5.0	1	CH ₂ FCH ₂ -CPh ₃	274.9 ± 16.7	1
	364.0 ± 3.8	1	CHF ₂ -CHF ₂	382.4 ± 15.5	1	CHF ₂ CH ₂ -CPh ₃	264.0 ± 16.7	1
C ₄ H ₉ -C ₄ H ₉			CCIF ₂ -CCIF ₂	378.7 ± 12.6	1	CH ₃ -CH ₂ OH	364.8 ± 4.2	1
iso-C ₄ H ₉ -iso-C ₄ H ₉	362.3 ± 6.3	1	CF,Cl-CFCl,	358.6 ± 12.6	1	CF ₃ -CH ₂ OH	405.4 ± 6.3	1
sec-C ₄ H ₉ -sec-C ₄ H ₉	348.5 ± 3.3	1	CHF,-CH,F	394.1 ± 16.7	1	C ₂ H ₅ -CH ₂ OH	356.9 ± 5.0	1
tert-C ₄ H ₉ -tert-C ₄ H ₉	322.6 ± 4.2	1	CH,F-CH,F	368.2 ± 8.4	1	C ₃ H ₇ -CH ₂ OH	357.3 ± 3.3	1
CH ₃ -cyclo-C ₅ H ₉	358.2 ± 5.0	1	CHF,-CH ₃	405.0 ± 8.4	1	iso-C ₃ H ₇ -CH ₂ OH	354.8 ± 4.2	1
CH ₃ -cyclo-C ₆ H ₁₁	377.0 ± 7.5	1	CH ₃ F-CH ₃	388.3 ± 8.4	1	C ₄ H ₆ -CH ₅ OH	355.6 ± 4.2	1
cyclo-C ₆ H ₁₁ -cyclo-C ₆ H ₁₁	369.0 ± 8.4	1	CHCIF-CH ₃	399.6 ± 12.6	1	sec-C ₄ H ₉ -CH ₂ OH	352.7 ± 4.2	1
CH ₃ -CH ₂ C≡CH	320.5 ± 5.0	1	CF ₂ Br-CHClF	369.4	1	iso-C ₄ H ₉ -CH ₂ OH	354.0 ± 5.4	1
CH ₃ -CH ₂ C≡CCH ₃	308.4 ± 6.3	1		396.6 ± 15.1	1	C ₆ H ₅ -CH ₃ OH	413.4 ± 5.4	1
CH ₃ -CH(CH ₃)C≡CH	305.4 ± 8.4	1	CCI -CCI		1	HOH,C-CH,OH	358.2 ± 6.3	1
CH_3 - $CH(CH_3)C\equiv CCH_3$	320.9 ± 6.3	1	CCl CCl	285.8 ± 6.3		NH ₂ CH ₂ -CH ₂ OH	335.6 ± 10.5	1
CH_3 - $C(CH_3)_2$ C \equiv CH	295.8 ± 6.3	1	CCl CHCl	282.0 ± 12.6	1	CH ₃ -CH ₂ OCH ₃	363.2 ± 5.0	1
$\mathbf{CH_3} - \mathbf{C(CH_3)_2C} = \mathbf{CCH_3}$	303.3 ± 6.3	1	CCl ₃ -CHCl ₂	303.3 ± 6.3	1	3 - 2 3		-

Bond	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	Bond	$D^o_{298}/\mathrm{kJ}\ \mathrm{mol}^{-1}$	Ref.	Bond	D^o_{298} /kJ mol $^{-1}$	Ref.
CH,OCH,-CH,OCH,	338.9 ± 10.5	1	C_{58} - C_2	955.2 ± 14.5	1	CI-CF,CF,Cl	331.4 ± 20.9	1
CH ₃ -C(O)H	354.8 ± 1.7	1				CI-CCl ₂ CF ₃	307.9	1
CCl ₃ -C(O)H	309.2 ± 5.0	1	(3) C-halogen BDEs			CI-CCI,CCI,	303.8	1
CH ₃ -C(O)F	417.6 ± 6.3	1	F-CN	482.8	1	CI-CHCICCI,	330.5 ± 4.2	1
CH ₃ -C(O)Cl	367.8 ± 6.3	1	F-CF ₃	546.8 ± 2.1	1	CI-CCI,CHCI,	311.7	1
CCl ₃ -C(O)Cl	289.1 ± 6.3	1	F-CHF ₂	533.9 ± 5.9	1	CI-CHCICH,	327.9 ± 1.8	1
CHCl ₂ -C(O)Cl	312.5 ± 8.4	1	F-CH ₂ F	496.2 ± 8.8	1	CI-CH,CH,Cl	345.1 ± 5.0	1
CCIH ₂ -C(O)Cl	340.2 ± 8.4	1	F-CF ₂ Cl	511.7	1	CI-CHBrCH,	331.8 ± 8.4	1
C_sH_s -C(O)H	408.4 ± 4.2	1	F-CFCl ₂	482.0 ± 10.5	1	CI-CH,CH,	352.3 ± 3.3	1
C_6H_5 –C(O)Cl	417.6 ± 6.3	1	F-CHFCl	462.3 ± 10.0	1	CI-CH,CH=CH,	298.3 ± 5.0	1
CH ₃ -C(O)CH ₃	351.9 ± 2.1	1	F-CCl ₃	439.3 ± 4	1	CI-C ₃ H ₇	352.7 ± 4.2	1
C ₂ H ₅ -C(O)CH ₃	347.3 ± 2.9	1	F-CH ₂ Cl	465.3 ± 9.6	1	CI-CH,CH,CH,CI	348.9	1
C_3H_7 -C(O)CH ₃	348.5 ± 2.9	1	F-CH ₃	460.2 ± 8.4	1	Cl–iso-C ₂ H ₇	354.0 ± 6.3	1
iso-C ₃ H ₇ -C(O)CH ₃	340.2 ± 3.8	1	F–C≡CH	521.3	1	CI-CH,CHCH=CH,	342.7	1
C_4H_7 -C(O)CH ₃	346.9 ± 5.4	1	F–C≡CF	519 ± 21	1	Cl-C ₄ H ₉	350.6 ± 6.3	1
tert-C ₄ H ₉ -C(O)CH ₃	329.3 ± 4.2	1	F-CF=CF ₂	546.4 ± 12.6	1	Cl–sec-C ₄ H ₉	350.2 ± 6.3	1
C_6H_5 -C(O)CH ₃	406.7 ± 4.6	1	F-CF ₂ CF ₃	532.2 ± 6.3	1	Cl–tert-C ₄ H ₉	351.9 ± 6.3	1
$C_6H_5CH_2-C(O)CH_3$	299.7 ± 8.4	1	F-CH ₂ CF ₃	457.7	1	CH,CHCHCI(CH ₃)	300.0 ± 6.3	1
HC(O)–C(O)H	295.8 ± 6.3	1	F-CF ₂ CH ₃	522.2 ± 8.4	1	Cl-C ₅ H ₁₁	350.6 ± 6.3	1
CIC(O)-C(O)Cl	292.5 ± 8.4	1	$\mathbf{F} - \mathbf{C}_2 \mathbf{H}_3$	517.6 ± 12.6	1	CI-C(CH ₃) ₂ (C ₂ H ₅)	352.7 ± 6.3	1
$CH_3C(O)$ - $C(O)H$	302.5 ± 8.4	1	$\mathbf{F} - \mathbf{C}_2 \mathbf{H}_5$	467.4 ± 8.4	1	Cl–cyclo-C _c H ₁₁	360.2 ± 6.5	1
$CH_3C(O)$ - $C(O)CH_3$	307.1 ± 4.2	1	\mathbf{F} - $\mathbf{C}_{3}\mathbf{H}_{7}$	474.9 ± 8.4	1	CI-C ₆ H ₅	399.6 ± 6.3	1
$C_6H_5C(O)-C(O)C_6H_5$	288.3 ± 16.7	1	F-iso-C ₃ H ₇	483.8 ± 8.4	1	Cl-C ₆ F ₅	383.3 ± 8.4	1
CH_3 -C(O)OH	384.9 ± 8.4	1	\mathbf{F} -tert- $\mathbf{C_4}\mathbf{H_9}$	495.8 ± 8.4	1	CI-CH ₂ C ₆ H ₅	299.9 ± 4.3	1
CF_3 -C(O)OH	370.7 ± 8.4	1	$\mathbf{F} - \mathbf{C}_{6}\mathbf{H}_{5}$	525.5 ± 8.4	1	CI-C(O)Cl	318.8 ± 8.4	1
CCl ₂ -C(O)OH	310.5 ± 12.6	1	$\mathbf{F} - \mathbf{C}_6 \mathbf{F}_5$	485 ± 25	1	CI-COF	376.6	1
CClH ₂ -C(O)OH	357.7 ± 8.4	1	F-CH ₂ C ₆ H ₅	412.8 ± 4.2	1	CI-C(O)CH ₂	354.0 ± 8.4	1
CH ₂ Br-C(O)OH	358.2 ± 8.4	1	F-COH	497.9 ± 10.5	1	CI-C(O)CH ₂ CH ₃	353.3 ± 6.3	1
$NH_2CH_2-C(O)OH$	349.4 ± 8.4	1	F-COF	510.3	1	Cl-C(O)C ₆ H ₅	341.0 ± 8.4	1
CH_3NHCH_2 -C(O)OH	300.4 ± 8.4	1	F-COCl	484.5	1	CI -CH ₂ C(O)C ₆ H ₅	309	1
C_6H_5 -C(O)OH	429.7 ± 8.4	1	F-C(O)CH ₃	511.7 ± 12.6	1	Cl-CH ₂ C(O)OH	310.9 ± 2.2	1
C_6F_5 –C(O)OH	470.0 ± 10.5	1	Cl-CN	422.6 ± 8.4	1	Cl-C(O)OC ₆ H ₅	364	1
HOCH ₂ -C(O)OH	371.5 ± 5.4	1	Cl-CF ₃	365.3 ± 3.8	1	CI-C(NO ₂) ₃	302.1	1
HOC(O)-C(O)OH	334.7 ± 6.3	1	CI-CHF ₂	364 ± 8	1	Br-CN	364.8 ± 4.2	1
$CH_3NHCH_2-C(O)OH$	301.2 ± 16.7	1	Cl-CH ₂ F	354.4 ± 11.7	1	Br-CF ₃	296.2 ± 1.3	1
$CH_3CH(NH_2)$ - $C(O)OH$	331.4 ± 16.7	1	Cl-CF ₂ Cl	333.9 ± 10.5	1	Br-CHF,	288.7 ± 8.4	1
NH ₂ CH ₂ -CH ₂ C(O)OH	325.5 ± 16.7	1	Cl-CFCl ₂	320.9 ± 8.4	1	Br-CF ₂ Cl	269.9 ± 6.3	1
CN-CN	571.9 ± 6.7	1	CI-CHFCl	346.0 ± 13.4	1	Br-CCl ₃	231.4 ± 4.2	1
HC(O)-CN	455.2 ± 8.4	1	Cl-CCl ₃	296.6	1	Br-CH ₂ Cl	237.4 ± 4.2 277.3 ± 3.6	1
HC(S)-CN	530.1 ± 8.4	1	CI-CHCl ₂	311.1 ± 2.0	1	Br-CBr ₃	242.3 ± 8.4	1
CF ₃ -CN	469.0 ± 4.2	1	CI-CH ₂ Cl	338.0 ± 3.3	1	Br-CHBr ₂	274.9 ± 13.0	1
CH ₃ -CN	521.7 ± 9.2	1	Cl-CBrCl ₂	287 ± 10.5	1	Br-CH ₂ Br	276.1 ± 5.3	1
NCC-CN	462.3	1	Cl–CH ₂ Br	332.8 ± 4.6	1	Br-CH,I	274.5 ± 7.5	1
C_2H_5 -CN	506.7 ± 7.5	1	Cl-CH ₂ I	328.2 ± 6.9	1	Br-CH ₂	294.1 ± 2.1	1
CH ₃ -CH ₂ CN	348.1 ± 12.6	1	CI-CH ₃	350.2 ± 1.7	1	Br-C≡CH	410.5	1
C ₆ H ₅ -CH ₂ CN	386.6 ± 8.4	1	Cl −C≡CCl	443 ± 50	1	Br-CH=CH ₂	338.3 ± 3.1	1
\mathbf{CH}_3 - $\mathbf{CH}(\mathbf{CH}_3)\mathbf{CN}$	332.6 ± 8.4	1	CI–C≡CH	435.6 ± 8.4	1	Br-CF ₂ CF ₃	283.3 ± 6.3	1
CH_3 -Cr(CH_3) ₂ CN	340.6 ± 16.7	1	CI-CH ₂ CN	267.4	1	Br-CClBrCF ₂	253.3 ± 6.3 251.0 ± 6.3	1
CH_3 - $C(CH_3)_2CN$ CH_3 - $C(CH_3)(CN)C_6H_5$	250.6 250.6	1	Cl-CCl=CCl ₂	383.7	1	Br-CF ₂ CF ₂ Br	282.8 ± 6.7	1
$(Ph)_2(CN)C-C(CN)(Ph)_2$		1	Cl-CH=CH ₂	394.1 ± 3.1	2	Br-CHClCF ₂	274.9 ± 6.3	1
(NO2)3C-C(NO2)3	308.8	1	Cl-CF=CF ₂	434.7 ± 8.4	1	Br-CF ₂ CH ₃	274.9 ± 6.3 287.0 ± 5.4	1
2/3		-	Cl-CF ₂ CF ₃	346.0 ± 7.1	1	2 2 2 3		-

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Bond	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	Bond	$D^{o}_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	Bond	$D^{o}_{298}/{ m kJ\ mol^{-1}}$	Ref.
Br-CH ₂ CH ₂ Cl	292.5 ± 8.4	1	I–2-naphthyl	272.0 ± 10.5	1	C ₆ H ₅ OO– H	384	1
Br-CHClCH ₃	272.0 ± 8.4	1	I-CH ₂ CN	187.0 ± 8.4	1	C ₆ H ₅ CH ₂ OO– H	363	1
$\mathbf{Br} - \mathbf{C}_{2}\mathbf{H}_{5}$	292.9 ± 4.2	1	I-CH ₂ OCH ₃	229.4 ± 8.4	1	$(C_6H_5)_2$ CHOO- H	370	1
\mathbf{Br} - $\mathbf{CH}_{2}\mathbf{CH}$ = \mathbf{CH}_{2}	237.2 ± 5.0	1	I-CH ₂ SCH ₃	216.8 ± 6.3	1	CH ₃ C(O)OO-H	386	1
$\mathbf{Br} - \mathbf{C}_{3}\mathbf{H}_{7}$	298.3 ± 4.2	1	I-C(O)CH ₃	223.0 ± 8.4	1	CCl ₂ (CN)OO–H	384	1
Br-iso-C ₃ H ₇	299.2 ± 6.3	1	I-C(O)C ₆ H ₅	212.1 ± 8.4	1	OHCH ₂ OO- H	368	1
$\mathbf{Br}\text{-}CH_{\scriptscriptstyle{2}}CH_{\scriptscriptstyle{2}}CH_{\scriptscriptstyle{2}}Br$	324.7	1	I-CH ₂ C(O)OH	197.5 ± 2.7	1	H-ONO	330.7	1
Br-CF ₂ CF ₂ CF ₃	278.2 ± 10.5	1	I-C(NO ₂) ₃	144.8	1	H-OONO	299.2	1
CF ₃ CFBrCF ₃	274.2 ± 4.6	1	(4) O. V. P.D.F			H-ONH ₂	318	1
\mathbf{Br} - $\mathbf{C}_{_{4}}\mathbf{H}_{_{9}}$	296.6 ± 4.2	1	(4) O–X BDEs	407.10 0.00	1	H-ONO ₂	426.8	1
Br-sec-C ₄ H ₉	300.0 ± 4.2	1	HO-H	497.10 ± 0.29	1	H-ONNOH	189	1
\mathbf{Br} - $tert$ - $\mathbf{C_4H_9}$	292.9 ± 6.3	1	FO-H	425.1	1	H-OPO ₂	465.7 ± 12.6	1
\mathbf{Br} - $\mathbf{C}_{6}\mathbf{H}_{5}$	336.4 ± 6.3	1	ClO-H	393.7	1	H-OSO ₂ OH	441.4 ± 14.6	1
\mathbf{Br} - $\mathbf{C}_{6}\mathbf{F}_{5}$	~328	1	BrO-H	405	1	H–OSiMe3	495	1
Br-CH ₂ C ₆ H ₅	239.3 ± 6.3	1	IO-H	403.3	1	(CH₃)CHNO- H	354.4	1
$Br-CH_2C_6F_5$	225.1 ± 6.3	1	CH ₃ O-H	440.2 ± 3	1	(CH ₃) ₂ CNO-H	354.0	1
$Br-1-C_{10}H_{7}$	339.7	1	CF ₃ O-H	497.1	1	(C ₆ H ₅)CHNO- H	368.6	1
$Br-2-C_{10}H_{7}$	341.8	1	НС≡СО−Н	443.1	1	PhO –H	362.8 ± 2.9	1
Br-anthracenyl	322.6	1	C_2H_5O-H	441.0 ± 5.9	1	α-tocopherol RO- H	323.4	1
Br-C(O)CH ₃	292.0 ± 8.4	1	CH ₂ =CHO-H	355.6	1	β-tocopherol RO- H	335.6	1
Br-C(O)C _e H _e	276.6 ± 8.4	1	CF ₃ CH ₂ O- H	447.7 ± 10.5	1	γ-tocopherol RO- H	335.1	1
Br-CH,C(O)CH,	257.9 ± 10.5	1	C ₃ H ₇ O- H	\leq 433 \pm 2	1	δ-tocopherol RO- H	342.8	1
Br-CH ₂ C(O)C ₆ H ₅	271	1	iso-C ₃ H ₇ O-H	442.3 ± 2.8	1	p-C ₆ H ₅ CH ₂ -C ₆ H ₄ O- H	356.2	1
Br-CH ₂ C(O)OH	257.4 ± 3.7	1	C ₄ H ₉ O– H	432.3	1	O-O,	106.6	1
Br-C(NO ₂) ₃	218.4	1	sec-C ₄ H ₉ O- H	441.4 ± 4.2	1	HO-OH	210.66 ± 0.42	1
I-CN	320.1	1	tert-C ₄ H ₉ O– H	444.9 ± 2.8	1	HO-OF	199.7 ± 8.4	1
I-CF ₂	227.2 ± 1.3	1	tert-BuCH ₂ O –H	436.1	1	HO-OCl	~146	1
I-CCl ₂	168 ± 42	1	C ₆ H ₅ CH ₂ O- H	442.7 ± 8.8	1	HO–OBr	138.5 ± 8.4	1
I-CH ₂ Cl	221.8 ± 4.2	1	CH ₃ C(OH)O-H	446.9 ± 6.3	1	FO-OF	199.6	1
I–CH ₂ Br	219.2 ± 5.4	1	(CH ₃) ₂ C(OH)O –H	450.6 ± 6.3	1	CIO-OCl	72.4 ± 2.8	1
I–CH,I	216.9 ± 7.9	1	HC(O)O-H	468.6 ± 12.6	1	IO-OI	74.9 ± 17	1
I-CH ₂	238.9 ± 2.1	1	CH ₃ C(O)O-H	468.6 ± 12.6	1	trans-perp-HO-ONO	≤67.8 ± 0.4	1
I-CH ₂ CN	187.0 ± 6.3	1	$C_2H_5C(O)O-H$	472.8	1	cis-cis-HO-ONO	83.3 ± 2.1	1
I-CF ₂ CF ₃	219.2 ± 2.1	1	iso-C ₃ H ₇ C(O)O-H	472.8	1	HO-ONO,	163.2 ± 8.4	1
I-CF ₂ CF ₃ I	217.2 ± 2.1 217.6 ± 6.7	1	C ₆ H ₅ C(O)O–H	464.4 ± 16.7	1	HO-OCH ₂	189.1 ± 4.2	1
I-CH ₂ CF ₃	235.6 ± 4.2	1	HOO- H	366.06 ± 0.29	1	HO-OCF ₂	201.3 ± 20.9	1
I-CHFCClF ₂	202 ± 2	1	CH ₃ OO- H	370.3 ± 2.1	1	HO-OC ₂ H ₅	178.7 ± 6.3	1
I-CF ₂ CH ₃	202 ± 2 217.6 ± 4.2	1	CF ₃ OO-H	383	1	HO-O-iso-C ₃ H ₇	185.8 ± 6.3	1
I-CFICH3	217.0 ± 4.2 218.0 ± 4.2	1	CH ₂ FOO- H	379	1	HO-O-tert-C ₄ H ₀	186.2 ± 4.2	1
CF ₃ CFICF ₃	215.1	1	CCl ₃ OO–H	386	1	HO-OC(O)CH ₃	169.9 ± 2.1	1
I-CH=CH,	259.0 ± 4.2	1	CHCl ₂ OO –H	383	1	HO-OC(O)C ₂ H ₅	169.9 ± 2.1 169.9 ± 2.1	1
2			CH ₂ ClOO-H	379	1	CH ₃ O-OCH ₃	167.9 ± 2.1 167.4 ± 6.3	1
I-C ₂ H ₅	233.5 ± 6.3	1	CBr ₃ OO–H	383	1	CF ₃ O-OCF ₃	107.4 ± 0.3 198.7 ± 2.1	1
I-CH ₂ CH=CH ₂	185.8 ± 6.3	1	CH ₂ BrOO-H	379	1	$C_2H_5O-OC_2H_5$	166.1	1
I-C ₃ H ₇	236.8 ± 4.2	1	C ₂ H ₅ OO-H	354.8 ± 9.2	1			1
I-iso-C ₃ H ₇	234.7 ± 6.3	1	CH ₃ CHClOO-H	377	1	C ₃ H ₇ O-OC ₃ H ₇	155.2 ± 4.2	
I-C ₄ F ₉	205.8	1	CH ₃ CCl ₂ OO-H	383	1	iso-C ₃ H ₇ O-O-iso-C ₃ H ₇	157.7	1
I-tert-C ₄ H ₉	227.2 ± 6.3	1	CF ₃ CHClOO-H	384	1	sec-C ₄ H ₉ O-O-sec-C ₄ H ₉	152.3 ± 4.2	1
I-C ₆ H ₅	272.0 ± 4.2	1	C ₂ Cl ₅ OO–H	383	1	tert-BuO-O-tert-Bu	162.8 ± 2.1	1
I-C ₆ F ₅	<301.7	1	iso-C ₃ H ₇ OO–H	356	1	tert-BuCH ₂ O-OCH ₂ - tert-Bu	152.3	1
I-CH ₂ C ₆ H ₅	187.8 ± 4.8	1	CH ₂ =CHCH ₂ OO- H	372.4	1	EtC(Me),O-OC(Me),Et	164.4 ± 4.2	1
I–1-naphthyl	274.5 ± 10.5	1	tert-C,H,OO-H	352.3 ± 8.8	1	$(CF_3)_3CO-OC(CF_3)_3$	104.4 ± 4.2 148.5 ± 4.6	1
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Bond	$D^{o}_{298}/\mathrm{kJ}~\mathrm{mol}^{-1}$	Ref.	Bond	$D^o_{298}/\mathrm{kJ}\mathrm{mol}^{-1}$	Ref.	Bond	$D^o_{298}/\mathrm{kJ}\ \mathrm{mol}^{-1}$	Ref.
Ph ₃ CO-OCPh ₃	131.4	1	CH ₃ O-C ₄ H ₉	346.0 ± 6.3	1	O ₂ N- ONO ₂	95.4 ± 1.5	1
SF ₅ O-OSF ₅	155.6	1	CH ₃ O-tert-C ₄ H ₉	353.1 ± 6.3	1	cis-HO–NO	207.0	1
SF ₅ O-OOSF ₅	126.8	1	C ₆ H ₅ -OCH ₃	418.8 ± 5.9	1	trans-HO-NO	200.64 ± 0.19	1
(CH ₃) ₃ CO-OSi(CH ₃) ₃	196.6	1	C ₆ H ₅ CH(CH ₃)-OCH ₃	313.4 ± 9.6	1	FO-NO	132.5 ± 17	1
tert-BuO-OGeEt ₃	192.5	1	C ₆ H ₅ -OC ₆ H ₅	326.8 ± 4.2	1	cis-ClO-NO	127.6 ± 8.4	1
tert-BuO-OSnEt ₃	192.5	1	CH ₃ -OC(O)H	383.7 ± 12.6	1	trans-ClO-NO	116.6 ± 8.4	1
CF ₃ OO-OCF ₃	126.8 ± 8.4	1	HC(O)-OH	457.7 ± 2.1	1	cis-BrO-NO	138.1 ± 8.4	1
HC(O)O- OH	199.2 ± 8.4	1	CH ₃ C(O)–OH	459.4 ± 4.2	1	trans-BrO-NO	121.6 ± 8.4	1
FC(O)O-OC(O)F	96.2	1	C ₆ H ₅ C(O)–OH	447.7 ± 10.5	1	trans-perp-HOO-NO	114.2 ± 4	1
CH ₃ C(O)O-ONO ₂	131.4 ± 8.4	1	HO-CH ₂ C(O)OH	368.2 ± 10.5	1	CH ₃ O-NO	176.6 ± 3.3	1
CH ₃ C(O)O-OC(O)CH ₃	140.2 ± 21	1	CH ₃ -OC(O)CH ₃	380.3 ± 12.6	1	C_2H_5O - NO	185.4 ± 4.2	1
$CF_3C(O)O$ -OC(O)C F_3	125.5	1	HC(O)-OCH ₃	423.8 ± 4.2	1	C_3H_7O – NO	179.1 ± 6.3	1
$CF_3OC(O)O-OC(O)F$	121.3 ± 4.2	1	CH ₃ C(O)-OCH ₃	424.3 ± 6.3	1	iso-C ₃ H ₇ O- NO	175.3 ± 4.2	1
$CF_3OC(O)O-OCF_3$	142.3 ± 2.9	1	C ₆ H ₅ C(O)–OCH ₃	421.3 ± 12.6	1	C ₄ H ₉ O- NO	177.8 ± 6.5	1
$CF_3OC(O)O-OC(O)$	119.2	1	$C_6H_5C(O)-OC_6H_5$	307.5 ± 8.4	1	iso-C ₄ H ₉ O- NO	175.7 ± 6.5	1
OCF ₃	117.2	1	CH ₃ OCH ₂ -OCH ₃	367.5 ± 8.4	1	sec-C ₄ H ₉ O-NO	173.6 ± 3.3	1
$C_2H_5C(O)O-OC(O)$	150.6	1	CH ₃ C(O)-OC(O)CH ₃	382.4 ± 12.6	1	tert-C ₄ H ₉ O- NO	176.1 ± 5.9	1
C_2H_5			$C_6H_5C(O)$ -OC(O) C_6H_5	384.9 ± 16.7	1	tert-AmO-NO	171.1 ± 0.4	1
$C_3H_7C(O)O-OC(O)$ C_3H_7	150.6	1	CH ₃ -OOH	300.4 ± 12.6	1	C ₆ H ₅ O- NO	87.0	1
FS(O) ₂ O-OS(O) ₂ F	92-100	1	C ₂ H ₅ -OOH	332.2 ± 20.9	1	HO-NO ₂	205.4	1
HO-CF ₂	≤482.0 ± 1.3	1	C ₃ H ₇ -OOH	364.4	1	FO-NO,	131.8 ± 12.6	1
FO-CF ₃	408 ± 17	1	iso-C ₃ H ₇ -OOH	298.3	1	ClO-NO,	110.9	4
HO-CH ₃	384.93 ± 0.71	1	tert-C ₄ H ₉ -OOH	309.2 ± 4.2	1	BrO-NO ₂	118.0 ± 6.3	1
HO-C ₂ H ₅	391.2 ± 2.9	1	CH ₃ -OOCH ₃	292.5 ± 8.4	1	IO-NO ₂	~100	1
HO-CH ₂ CF ₃	408.4 ± 8.4	1	CF ₃ -OOCF ₃	361.5 ± 8.4	1	CH ₃ O-NO ₂	176.1 ± 4.2	1
HO-CH,CH=CH,	332.6 ± 4.2	1	CH ₃ -OO	137.0 ± 3.8	1	$C_2H_5O-NO_2$	174.5 ± 4.2	1
HO-C ₃ H ₇	392.0 ± 2.9	1	CF ₃ -OO	169.0	1	$C_3H_7O-NO_2$	177.0 ± 4.2	1
HO-iso-C ₂ H ₇	397.9 ± 4.2	1	CClF ₂ -OO	127.6	1	iso-C ₃ H ₇ O-NO ₂	175.7 ± 4.2	1
$HO-C_4H_9$	389.9 ± 4.2	1	CCl ₂ F-OO	124.7	1	HOO-NO ₂	99.2 ± 4.6	1
HO-sec-C ₄ H _o	396.1 ± 4.2	1	CH ₂ Cl-OO	122.4 ± 10.5	1	CH ₃ OO-NO ₂	86.6 ± 8.4	1
HO-iso-C ₄ H ₉	394.1 ± 4.2	1	CHCl ₂ -OO	108.2 ± 8.2	1	CF ₃ OO-NO ₂	105	1
HO-tert-C ₄ H ₉	398.3 ± 4.2	1	CCl ₃ -OO	92.0 ± 6.4	1	CF ₂ ClOO-NO ₂	106.7	1
HO-CH(CH ₂)(nC ₂ H ₂)	398.3 ± 4.2	1	HC(O)-OOH	290.0	1	CFCl ₂ OO-NO ₂	106.7	1
HO-CH(C ₂ H ₂) ₂	399.2 ± 4.2	1	CH ₃ C(O)-OOC(O)CH ₃	315.1	1	CCl ₃ OO-NO ₂	95.8	1
$HO-C(CH_3)_3(C_3H_5)$	395.8 ± 6.3	1	CIO-CF ₃	\leq 369.9 ± 1.3	1	CH ₃ N(O)-O	305.3 ± 4.4	1
HO-C ₆ H ₅	463.6 ± 4.2	1	CH ₃ -ONO	245.2	1	$C_6H_5N(O)$ -O	392 ± 8	1
HO-C ₆ F ₅	446.9 ± 9.2	1	C ₂ H ₅ -ONO	260.2	1	$C_5H_5N-\mathbf{O}$	264.9 ± 2.0	1
HO-CH ₂ C ₆ H ₅	334.1 ± 2.6	1	C ₃ H ₇ -ONO	249.4 ± 6.3	1	$C_6H_5N=N(O)(C_6H_5)-O$	309.4 ± 3.5	1
HO-C(CH ₂) ₂ C ₆ H ₅	339.3 ± 6.3	1	iso-C ₃ H ₇ -ONO	254.4 ± 6.3	1	$C_6H_5(O)N=N(O)(C_6H_5)$ -	309.4 ± 3.6	1
cyclo-C ₅ H ₉ - OH	385.8 ± 6.3	1	C ₄ H ₉ -ONO	256.5 ± 6.3	1	0		
1-C ₁₀ H ₇ - OH	468.6 ± 6.3	1	iso-C ₄ H ₉ -ONO	254.0 ± 6.3	1	O-SO	551.1	1
2-C ₁₀ H ₇ - OH	467.8 ± 6.3	1	sec-C ₄ H ₉ -ONO	253.6 ± 6.3	1	O-SOF ₂	513.3	1
(CH ₃) ₂ (NH ₂)C- OH	310.4 ± 6.3	1	tert-C ₄ H ₉ -ONO	252.7 ± 6.3	1	O-SOCl ₂	398.5	1
CH ₃ C(O)-OH	459.4 ± 4.2	1	$(C_2H_5)(CH_3)_2C$ - ONO	254.0 ± 8.4	1	O-S(OH) ₂	493.7 ± 25	1
носн, -он	411.3	1	CH ₃ -ONO ₂	340.2	1	HO-SH	293.3 ± 16.7	1
CH ₂ -OCH ₂	351.9 ± 4.2	1	C ₂ H ₅ -ONO ₂	344.8	1	HO-SOH	313.4 ± 12.6	1
ICH,-OCH,	373.2 ± 12.6	1	CH ₃ O-CH ₂ CN	393.3	1	HO-S(OH)O ₂	384.9 ± 8.4	1
CH ₃ O-C ₂ H ₅	355.2 ± 5.4	1	$O-N_2$	167.4 ± 0.4	1	HO-SCH ₃	303.8 ± 12.6	1
CH ₃ O-CHCICH ₃	370.3 ± 8.4	1	O-NO	306.21 ± 0.13	1	HO-SO ₂ CH ₃	360.2 ± 12.6	1
CH ₃ O-C ₃ H ₇	358.6 ± 6.3	1	O-NO ₂	206.3	1	F-OH	215.1	1
CH ₃ O-iso-C ₃ H ₇	360.7 ± 4.2	1	NO-NO	40.6 ± 2.1	1	F-OF	164.1	1
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F-OCF,	200.8 ± 4.2	1	ON-NO ₂	42.5	1	C ₆ H ₅ CH ₂ -NH ₃	306.7 ± 6.3	1
F-OCH ₃	>196.6	1	O ₂ N-NO ₂	57.3 ± 1	1	C ₆ H ₅ CH(CH) ₃ -NH ₂	307.5 ± 9.6	1
F-ONO ₂	143.1	1	H ₂ N-NH ₂	277.0 ± 1.3	1	HC(O)-NH	421.7 ± 8.4	1
Cl-OH	233.5	1	F ₂ N-NF ₂	92.9 ± 12.6	1	CH ₂ C(O)-NH ₂	414.6 ± 8.4	1
CI-OCl	142	1	H ₂ N-NHCH ₂	275.8 ± 8.4	1	HS-NO	138.9	1
Cl-OCF ₂	≤220.9 ± 8.4	1	H ₂ N-N(CH ₂) ₂	259.8 ± 8.4	1	CH ₃ S-NO	104.6 ± 4.2	1
Cl-OCH ₂	200.8	1	H,N-NHC,H,	227.6 ± 8.4	1	tert-BuS-NO	115.1	1
Cl-O-tert-C ₄ H _o	198.3	1	H ₂ N-NO ₂	230	1	PhCH ₂ S-NO	120.5	1
Cl-OOCl	91.2	1	H ₂ NN(CH ₃)- NO	179.6	1	C ₆ H ₅ S- NO	81.2 ± 5.4	1
Cl-ONO,	172.0	1	$(C_6H_5)_2$ N- NO	94.6	1	SCN-SCN	255.6	1
Br-OH	209.6 ± 4.2	1	N,-CH,	335.1 ± 20.5	1	FSO ₂ -NF ₂	163	1
Br-OBr	125	1	N ₃ -C ₆ H ₅	375.7 ± 20.9	1	F-NO	235.26	1
Br -O-tert-C ₄ H ₉	183.3	1	N ₃ -CH ₂ C ₆ H ₅	211.3 ± 14.2	1	F-NO ₂	221.3	1
Br-ONO ₂	143.1 ± 6.3	1	CH ₂ -NC	413.0 ± 3.3	1	F-NF ₂	254.0	1
I-OH	213.4	1	C ₂ H ₅ -NC	413.4 ± 8.4	1	F-NH ₂	286.6	1
I-OI	130.1	1	iso-C ₃ H ₇ -NC	423.0 ± 8.4	1	Cl–NO	158.8 ± 0.8	1
I-ONO ₂	>140.6	1	tert-C ₄ H ₉ -NC	399.6 ± 5.4	1	Cl-NO ₂	130.8 ± 0.8 141.8 ± 1.3	1
I ONO ₂	>140.0	1	NC-NO	204.4	1	2	~134	1
(5) N-X BDEs				172	1	Cl-NF ₂	253.1	1
\mathbf{H} - \mathbf{NH}_2	450.08 ± 0.24	1	CH ₃ -NO		1	Cl-NH ₂		1
H -NF $_2$	316.7 ± 10.5	1	CF ₃ -NO	167		Br-NO	120.1 ± 0.8	
H-NNH	254.4	1	CCl ₃ -NO	125	1	Br-NO ₂	82.0 ± 7.1	1
$H-N_3$	≤389	1	C ₂ H ₅ -NO	171.5	1	Br-NF ₂	<227.2	1
H-N=CH ₂	364 ± 25	1	CH ₂ CHCH ₂ -NO	110	1	I-NO	75.6 ± 4	1
H-NO	199.5	1	iso-C ₃ H ₇ -NO	152.7 ± 12.6	1	I-NO ₂	79.6 ± 4	1
H-NHOH	341	1	tert-C ₄ H ₉ -NO	167	1	(6) S-X BDEs		
H-NCO	460.7 ± 2.1	1	C ₆ H ₅ -NO	226.8 ± 2.1	1	H-SH	381.18 ± 0.05	1
H-NCS	\leq 396.6 \pm 4.6	1	C ₆ F ₅ -NO	211.3 ± 4.2	1	H-SCH ₃	365.7 ± 2.1	1
H-NCS	347.3 ± 8.4	1	C ₆ H ₅ CH ₂ -NO	123	1	H-SCHCH,	351.5 ± 8.4	1
CH ₃ NH ₂	425.1 ± 8.4	1	CH ₃ -NO ₂	260.7 ± 2.1	1	H-SC ₂ H ₅	365.3	1
tert-BuN H ₂	397.5 ± 8.4	1	C ₂ H ₅ -NO ₂	254.4	1	H-SC ₃ H ₇	365.7	1
C ₆ H ₅ CH ₂ NH ₂	418.4	1	C ₃ H ₇ -NO ₂	256.5	1	H-S-iso-C ₃ H ₇	369.9 ± 8.4	1
(CH ₃) ₂ N H	395.8 ± 8.4	1	iso-C ₃ H ₇ -NO ₂	259.8	1	H-S-tert-C ₄ H ₉	362.3 ± 9.2	1
H-NHNH(CH ₃)	276 ± 21	1	C ₄ H ₉ -NO ₂	254.8	1	H-SOH	330.5 ± 14.6	1
H-NHN(CH ₃) ₂	356 ± 21	1	sec-C ₄ H ₉ -NO ₂	263.2	1	H-SCOCH ₃	370.7	1
NH ₂ CN	414.2	1	tert-C ₄ H ₉ -NO ₂	258.6	1	H-SCOPh	364	1
$(NH_2)_2C=O$	464.4	1	C ₆ H ₅ -NO ₂	295.8 ± 4.2	1	H-SO ₂ CH ₃	≤397	1
$(NH_2)_2C=S$	389.1	1	C ₆ H ₅ CH ₂ -NO ₂	210.3 ± 6.3	1	H-SSCH ₃	330.5 ± 14.6	1
CH_3CSNH_2	380.7	1	(NO ₂)CH ₂ -NO ₂	207.1	1	H–SPh	349.4 ± 4.5	1
PhCSNH ₂	380.7	1	(NO ₂) ₃ C-NO ₂	176.1	1	H-SSH	318.0 ± 14.6	1
$(PhNH)_2C=S$	364.0	1	CF ₃ -NF ₂	280.7	1	H-SSSH	292.9 ± 6.5	1
$(NH_2)_2C=NH$	435.1	1	CH NH	237.2 ± 14.6	1	HS-SH	270.7 ± 8.4	1
$Ph_{2}C=NH$	489.5	1	CH ₃ -NH ₂	356.1 ± 2.1	1	FS-SF	362.3	1
H-N(SiMe ₃) ₂	464	1	C ₂ H ₅ -NH ₂	352.3 ± 6.3	1	CIS-SCI	329.7	1
H-NHPh	375.3	1	C ₃ H ₇ -NH ₂	356.1 ± 2.9	1	HS-SCH ₃	272.0	1
C ₆ H ₅ N H OH	292	1	iso-C ₃ H ₇ -NH ₂	357.7 ± 3.8	1	HS-SPh	255.2 ± 6.3	1
C ₆ H ₅ N H (CONMe2)	387.9	1	C ₄ H ₉ -NH ₂	356.1 ± 2.9	1	CH ₃ S-SCH ₃	272.8 ± 3.8	1
H – NPh_2	364.8	1	sec-C ₄ H ₉ -NH ₂	359.0 ± 2.9	1	C ₂ H ₅ S-SC ₂ H ₅	276.6	1
$HN-N_2$	63	1	iso-C ₄ H ₉ -NH ₂	254.8 ± 5.0	1	MeS–SPh	272.0 ± 6.3	1
ON-N	480.7 ± 0.4	1	tert-C ₄ H ₉ -NH ₂	355.6 ± 6.3	1	C ₆ H ₅ S-SC ₆ H ₅	214.2 ± 12.6	1
ON-NO	8.49 ± 0.12	1	pyridin-2-yl-NH ₂	431	1	F ₅ S-SF ₅	305 ± 21	1
			$C_6H_5-NH_2$	429.3 ± 4.2	1	3 3		

Bond	$D^{o}_{298}/\mathrm{kJ}~\mathrm{mol}^{-1}$	Ref.	Bond	$D^{o}_{298}/\mathrm{kJ}\ \mathrm{mol}^{-1}$	Ref.	Bond	$D^{o}_{298}/\mathrm{kJ}~\mathrm{mol}^{-1}$	Ref.
HS-CH	312.5 ± 4.2	1	SiH ₃ - Br	376 ± 9	1	MgO-H	441	1
HS-C ₂ H ₅	307.9 ± 2.1	1	SiH ₃ -I	299 ± 8	1	Mg(OH)–OH	349	1
HS -C ₃ H ₇	310.5 ± 2.9	1	GeH ₃ - H	348.9 ± 8.4	1	BrMg-CH ₂	253	1
HS-iso-C ₃ H ₇	307.1 ± 3.8	1	Me ₂ Ge– H	364.0	1	BrMg-CH ₂ CH ₃	205	1
$HS-C_4H_9$	309.2 ± 2.9	1	Ph ₃ Ge–H	359.8	1	BrMg-i-C ₃ H ₇	184	1
HS-sec-C ₄ H ₉	307.5 ± 2.9	1	(CH ₃) ₃ Ge-Ge(CH ₃) ₃	280.3	1	$\mathbf{BrMg} = \mathbf{t} - \mathbf{C}_{a}\mathbf{H}_{a}$	174	1
HS-iso-C ₄ H ₉	310.0 ± 4.6	1	(CH ₃) ₃ Ge Ge(CH ₃) ₃ (CH ₃) ₄ Ge-CH ₃	288.7	1	BrMg-C ₆ H ₅	289	1
HS-tert-C ₄ H _o	301.2 ± 3.8	1	Me ₃ Sn-H	326.4	1	BrMg-CH ₂ C ₆ H ₅	201	1
HS-C ₆ H ₅	360.7 ± 6.3	1	Ph ₃ Sn-H	294.6	1	BrMg-C(C_6H_5)	180	1
HS-CH2C6H5	258.2 ± 6.3	1	(CH ₃) ₃ Sn-Sn(CH ₃) ₃	257.7	1	Ca(OH)–OH	409	1
HS-C(O)H	309.6 ± 8.4	1	(CH ₃) ₃ Sn-Cl	425 ± 17	1	Sr(OH)-OH	407	1
HS-C(O)CH ₃	307.9 ± 6.3	1	(CH ₃) ₃ Pb-Pb(CH ₃) ₃	228.4	1	Ba(OH)-OH	443	1
3		1	Cl ₂ Pb-Cl	271 ± 84	1	Da(OII)—OII	773	1
CH ₃ S-CH ₃	307.9 ± 3.3	1	(CH ₃) ₃ Pb-CH ₃		1	(10.3) Group 3		
HOS-CH ₃	284.9 ± 12.6		(CII ₃) ₃ FD-CII ₃	238 ± 21	1	Sc-CH ₃	116 ± 29	1
CH ₃ SO-CH ₃	221.8 ± 8.4	1	(8) P-, As-, Sb-, Bi-X BD	Es		Sc-C ₆ H ₆	60.8	1
HOSO ₂ -CH ₃	324.3 ± 12.6	1	H_2P-H	351.0 ± 2.1	1	$La(\eta^5-C_5Me_5)_2-$	278.7 ± 10.5	1
CH ₃ SO ₂ -CH ₃	279.5	1	CH ₃ PH -H	322.2 ± 12.6	1	CH(SiMe ₃) ₂	276.7 ± 10.5	1
F ₅ S-CF ₃	392 ± 43	1	$\mathbf{H}_{2}\mathbf{P}$ -PH $_{2}$	256.1	1	$Nd(\eta^5-C_5Me_5)_2$	236.8 ± 10.5	1
F-SF ₅	391.6	1	$(C_2H_5)_2P-P(C_2H_5)_2$	359.8	1	CH(SiMe ₃) ₂	22601126	
F-SO ₂ (F)	379	1	$\mathbf{F}_{2}\mathbf{P}$ -F	549	1	$(\eta^5 - C_5 Me_5)_2 Sm - H$	226.8 ± 12.6	1
Cl-SF ₅	<272	1	Cl ₂ P–Cl	356 ± 8	1	$(\eta^5 - C_5 Me_5)_2 Sm - OCH_3$	343.1	1
CI-SO ₂ CH ₃	293	1	$\mathbf{Br}_{2}\mathbf{P}$ - \mathbf{Br}	<259	1	$(\eta^5-C_5Me_5)_2Sm-(\eta^3-C_4H_5)$	188.3 ± 6.3	1
Cl-SO ₂ Ph	297	1	I_2P-I	217	1	$(\eta^5 - C_5 Me_5)_3 Sm - S - nC_3 H_7$	295.4 ± 10.0	1
Br-SBr	259 ± 17	1	H_2P -Si H_3	331.4	1	$(\eta^5 - C_5 Me_5)_2 Sm - N(CH_3)_2$	201.7 ± 7.5	1
Br-SF ₅	<230	1	H ₂ As-H	319.2 ± 0.8	1	$(\eta^5 - C_5 Me_5)_2 Sm - SiH$		
I-SH	206.7 ± 8.4	1	H ₂ Sb-H	288.3 ± 2.1	1	$(SiMe_3)_2$	179.9 ± 21	1
I-SCH ₃	206.3 ± 7.1	1	F ₂ Bi-F	435 ± 19	1	$(\eta^5-C_5Me_5)_2Sm-P(Et)_2$	136.4 ± 8.4	1
(7) Si-, Ge-, Sn-, and Pb	-X BDEs		$\mathbf{Br}_{2}\mathbf{Bi} ext{-}\mathrm{Br}$	>297.1	1	$(\eta^5-C_5Me_5)_2$ Eu $-I$	238.9 ± 8.4	1
SiH ₃ – H	383.7 ± 2.1	1	(9) Se- and Te-X BDEs			$(\eta^5-C_5Me_5)_2Yb-I$	256.1 ± 6.3	1
$Me_{_3}Si$ – H	396 ± 7	1	H–SeH	334.93 ± 0.75	1	Lu(η ⁵ -C ₅ Me ₅) ₂ -	279.1 ± 10.5	1
H_5Si_2 - H	373 ± 8	1	H–SeC ₆ H ₅	326.4 ± 16.7	1	CH(SiMe ₃) ₂	255 1 6	
$(C_2H_5)_3Si-H$	396 ± 4	1	PhSe-SePh	280 ± 19	1	$(\eta^5 - C_5 H_4 SiMe_3)_3 Th - H$	277 ± 6	1
$C_6H_5SiH_2$ – H	382 ± 5	1	H –ТеН	277.0 ± 5.0	1	$(\eta^5-C_5H_4SiMe_3)_3Th-O$	371 ± 24	1
$(CH_3S)_3Si-H$	364.0	1	H-TeC ₆ H ₅	≤264	1	$(\eta^5-C_5H_5)_3Th-CH_3$	375 ± 9	1
(iPrS) ₃ Si –H	376.6	1	PhTe-TePh	138.1 ± 12.6	1	(η ⁵ - C ₅ H ₅) ₃ Th – CH ₂ Si(CH ₃) ₃	369 ± 12	1
PhMe ₂ Si –H	377 ± 7	1				$(\mathbf{C_9H_7})_3\mathbf{Th} - \mathbf{CH_2C_6H_5}$	342 ± 9	1
Ph_2SiH – H	379 ± 7	1	(10) Metal-Centered BD	Es		$(\eta^5 - C_5 H_4 tBu)_2 U - H$	249.7 ± 5.7	1
Ph ₂ MeSi– H	361 ± 10	1	Arranged by the Periodic	Table		$(\eta^5 - C_5 H_4 SiMe_2)_3 U - H$	253.7 ± 5.1	1
SiF_3 - H	432 ± 5	1	(10.1) Group 1			[HB(3,5-Me ₂ Pz) ₂]		
SiCl ₃ - H	391	5	Li-OH	431.0	1	$U(Cl)_2$ -Cl	422.6	1
$SiBr_3$ - H	334 ± 8	1	Li-C ₂ H ₅	214.6 ± 8.4	1	$(\eta^5-C_5H_4SiMe_3)_3U-I$	265.6 ± 4.3	1
SiH ₃ -SiH ₃	321 ± 4	1	Li-nC ₄ H ₉	197.9 ± 16.3	1	$(\eta^5-C_5H_4tBu)_3U-O$	307 ± 9	1
\mathbf{SiH}_{3} $-\mathbf{Si}_{2}\mathbf{H}_{5}$	313 ± 8	1	Na-OH	342.3	1	(η ⁵ -C ₅ H ₄ SiMe ₃) ₃ U–CO	43.1 ± 0.8	1
Ph ₃ Si-SiPh ₃	368.2	1	Na-On	<200	1	(C ₉ H ₇) ₃ U-CH ₃	196.3 ± 6.6	1
$\mathbf{F}_{3}\mathbf{Si}$ -Si \mathbf{F}_{3}	453.1 ± 25	1	K -OH	359	1	(η ⁵ -C ₅ Me ₅) ₂ U(Cl)-C ₆ H ₅	358 ± 11	1
SiH ₃ -CH ₃	375 ± 5	1	Rb-OH	356.2 ± 4.2	1	(η ⁵ -C ₅ H ₄ SiMe ₃) ₃ U-THF	41.0 ± 0.8	1
SiF_3 - CH_3	355.6	1	Cs-OH	373	1			
H ₃ Si– NO	158.2 ± 5.7	1	- CSO11	313	1	(10.4) Group 4		_
H_3Si-PH_2	331.4	1	(10.2) Group 2			$Ti(\eta^5-C_5H_5)_2-Cl$	471	1
SiH_3 – F	638 ± 5	1	ВеО-Н	469	1	$Ti(Cl)(\eta^5-C_5H_5)_2-Cl$	390	1
SiH ₃ -Cl	458 ± 7	1	Ве(ОН)-ОН	476	1	$\mathbf{Ti}(\mathbf{\eta}^{5}-\mathbf{C}_{5}\mathbf{Me}_{5})_{2}$ –I	219	1

n 1	Do /II I-1	D. C	l n 1	Do /II I-1	D.C	D 1	Da /II I-1	р. с
Bond	<i>D</i> ° ₂₉₈ /kJ mol ⁻¹		Bond	$D_{298}^{o}/\text{kJ mol}^{-1}$		Bond	<i>D</i> ° ₂₉₈ /kJ mol ⁻¹	
$Ti(\eta^5 - C_5 H_5)_2 - CO$	174	1	Cr(C ₆ H ₆)-C ₆ H ₆	268.2 ± 15.4	1	Fe-CH ₃	135 ± 29	1
$Ti(CO)(\eta^5-C_5H_5)_2$ -CO	170 174 ± 20	1	Cr(CO) ₅ -C ₆ H ₆	57.3 ± 3.3	1	Fe(C ₂ H ₄)(CO) ₃ -C ₂ H ₄	89.1 ± 8	1
Ti-CH ₃	174 ± 29	1	(P(C ₆ H ₁₁) ₃) ₂ (CO) ₃ Cr- P(OMe ₃) ₃	68.6 ± 2.5	1	Fe-C ₃ H ₅	218	1
$Ti(CI)(\eta^5-C_5H_5)_2-CH_3$	276	1	$(\eta^5-C_5H_5))Mo(CO)_3-H$	290	1	Fe-C ₃ H ₆	79	1
$Ti(CI)((\eta^5-C_5H_5)_2-C_6H_5$	292	1	$Mo(\eta^5-C_5H_5)_2-H$	246	1	Fe(CO) ₅ -Ni(CO) ₄	37.7	1
$Ti(C_6H_6)-C_6H_5$	308.7	1	$Mo(H)(\eta^5-C_5H_5)_2-H$	256.9 ± 8.4	1	$\mathbf{Fe(CO)}_{5} - (\eta^{3} - C_{3}H_{5})$	176	1 1
$\operatorname{Zr}(\operatorname{H}^5 - \operatorname{C}_5 \operatorname{Me}_5)_2 - \operatorname{H}$	351.0 ± 7.5 326.4 ± 4	1	$Mo(CO)_3(\eta^5-C_5H_5)-I$	216.7 ± 4.2	1	Fe(C ₃ H ₆)(CO) ₃ -C ₃ H ₆	~79.5 272	
$\mathbf{Zr}(\mathbf{H})(\eta^5 - \mathbf{C}_5 \mathbf{Me}_5)_2 - \mathbf{H}$		1	$(\eta^5 - C_5 Me_5)_2 Mo - O$	272	1	(CO ₂)(η ⁵ -C ₅ H ₅)Ru-H		1 1
$\mathbf{Zr}(\eta^5 - \mathbf{C}_5 \mathbf{Me}_5)_2 - \mathbf{Cl}$	481.2 410.0	1	$(P(C_6H_{11})_3)_2(CO)_3Mo-$			$(PMe_3)_2(\eta^5-C_5Me_5)Ru-H$	337.6	1
$\mathbf{Zr}(\mathbf{\eta}^5 - \mathbf{C}_5 \mathbf{Me}_5)_2 - \mathbf{Br}$		1	H ₂	27.2 ± 0.8	1	$(CO)_2(\eta^5-C_5Me_5)Ru-Cl$	337.0	1
$\mathbf{Zr}(\mathbf{I})(\eta^5 - \mathbf{C}_5 \mathbf{Me}_5)_2 - \mathbf{I}$	336.4 ± 2.1		$(P(C_6H_{11})_3)_2(CO)_3Mo-$	37.7 ± 2.5	1	$(\eta^5-C_5Me_5)(PMe_3)_2Ru-$ Cl	<138	1
$\operatorname{Zr}(\eta^5 - C_5 \operatorname{Me}_5)_2(\operatorname{Ph}) - \operatorname{OH}$	482.4 ± 6.3	1	N_2			(η ⁵ -C ₅ Me ₅)(PMe ₃) ₂ Ru-	2045	_
$\mathbf{Zr}(\eta^5 - \mathbf{C}_5 \mathbf{Me}_5)_2(\mathbf{Ph})(\mathbf{OH})$ -OH	482.8 ± 10.5	1	Mo(CO) ₅ -CO	169.5 ± 8.4	1	OH	204.6	1
Zr (η ⁵ -			$\mathbf{Mo(CO)}_3 (\eta^5 - \mathbf{C}_5 \mathbf{H}_5) - \mathbf{CH}_3$		1	$(CO)_4$ Ru $-CO$	115 ± 1.7	1
$C_5Me_5)_2(NH_2)H-NH_2$	421.3 ± 15.1	1	W(CO) ₅ –Xe	35.1 ± 0.8	1	$(\eta^{5}-C_{5}Me_{5})(PMe_{3})_{2}Ru-$	142.3	1
$\mathbf{Zr}(\eta^5-\mathbf{C}_5\mathbf{Me}_5)_3$ - \mathbf{CH}_3	276 ± 10	1	$W(CO)_3(\eta^5-C_5H_5)-H$	303	1	CH ₃		
$\mathbf{Zr}(\eta^{5}-\mathbf{C}_{5}\mathbf{H}_{5})_{2}(\mathbf{C}_{6}\mathbf{H}_{5})-$	300 ± 10	1	$W(H)(\eta^5-C_5H_5)_2-H$	310.9 ± 4.2	1	$Os(H)(CO)_4$ –H	326.4	1
C_6H_5	300 ± 10	1	$\mathbf{W}(\mathbf{I})(\eta^5 - \mathbf{C}_5 \mathbf{H}_5)_2 - \mathbf{H}$	273 ± 14	1	(CO) ₄ Os–CO	133 ± 2.6	1
$\operatorname{Zr}(\eta^5 - \operatorname{C}_5 \operatorname{H}_5)_2(\operatorname{Si}(\operatorname{SiMe}_3)_3)$	188 ± 30	1	(CO) ₅ W-H ₂	≥67	1	$Os(C_2H_2)(CO)_4$ -CO	99.5 ± 0.8	1
-SiMe ₃	346.0 ± 7.9	1	$(P(C_6H_{11})_3)(CO)_3W-$	28.5 ± 2.1	1	(10.9) Group 9		
$Hf(H)(\eta^5-C_5Me_5)_2-H$ $Hf(\eta^5-C_5Me_5)(C_4H_0)-$	340.0 ± 7.9	1	(η²-H ₂) W(CO) 5-CO	192.5 ± 8.48.4	1	(CO) ₄ Co-Co(CO) ₄	83 ± 29	1
C_4H_9	274 ± 10	1	$W(CH_3)(\eta^5-C_5H_5)_2-CH_3$	220.9 ± 4	1	$(CO)_4^4 Co-Mn(CO)_5$	96 ± 12	1
			W(CII ₃)(1 -C ₅ II ₅) ₂ -CII ₃	220.7 ± 4	1	(CO) ₄ Co-Re(CO) ₅	113 ± 15	1
(10.5) Group 5			(10.7) Group 7			Co(CO) ₄ -H	278	1
$(\eta^5 - C_5 H_5)(CO)_3 V - \eta^2 H_2$	90 ± 20	1	F ₃ Mn-MnF ₃	210.9 ± 2.5	1	Co(CO) ₃)(PPh ₃)-H	272	1
$(\eta^5-C_5H_5)(CO)_3V-CO$	146 ± 21	1	$(CO)_5Mn-Mn(CO)_5$	185 ± 8	1	(CO) ₃ HCo-CO	~54	1
V-CH ₃	169 ± 18	1	(CO) ₅ Mn–H	284.5	1	(η ⁵ -C ₅ H ₅)Co(CO)-CO	184.3 ± 4.8	1
$V-C_6H_6$	76.2	1	(PPh ₃)Mn(CO) ₄ -H	286.2	1	Co-CH	331 ± 38	1
$V(C_6H_6)-C_6H_6$	307.8	1	MnBr(CO) ₄ -CO	184	1	Co-CH,	178 ± 8	1
$Nb(\eta^5-C_5H_5)_2H_3$ -TFE	18.8 ± 1.3	1	$(\eta^5-C_5H_5)(CO)_2Mn$ –CO	195.8 ± 9.2	1	cobalamin–CH,	150.6	1
Ta(CH ₃) ₅ -CH ₃	261 ± 5	1	Mn-CH ₃	$>$ 35 \pm 12	1	cobinamide–iC,H,	104	1
(Me ₃ SiCH ₂) ₄ Ta- (CH ₂ SiMe ₃)	184.1 ± 8.4	1	$\mathbf{Mn(CO)}_{5}$ - \mathbf{CH}_{3}	187.0 ± 3.8	1	Co –C bonds in B ₁₂	123.8 ± 6.3	1
(CI I ₂ SHVIC ₃)			$\mathbf{Mn}(\mathbf{CO})_5 - \mathbf{C}_6 \mathbf{H}_5$	207 ± 11	1	Cl(CO) ₂ Rh-Rh(CO) ₂ Cl	94.6	1
(10.6) Group 6			$(CO)_5Mn$ -Re $(CO)_5$	149 ± 11	1	HRh(m-xylyl)Rh-H	255.6 ± 1.7	1
$[Cr(CO)_3(\eta^5-C_5Me_5)]_2$ -	61.5	1	$(\eta^5 - C_5 H_5) Mn(CO)_2 -$	59.4 ± 3.3	1	(PiPr ₃) ₂ (Cl)Rh-H ₂	136.0	1
Hg			PhMe			(PiPr ₃) ₂ (Cl)Rh-N ₂	69.0	1
$[\mathrm{Cr(CO)}_3(\eta^5\text{-}\mathrm{C}_5\mathrm{Me}_5)]-$ Hg	111.3	1	$(CO)_5$ Tc $-$ Tc $(CO)_5$	177.5 ± 1.9	1	(PiPr ₃) ₂ (Cl)Rh-CO	201.7	1
Cr(CO) ₅ –Xe	37.7 ± 3.8	1	(CO) ₅ Re-Re(CO) ₅	187 ± 4.8	1	HRh(m-xylyl)Rh-	195.4 ± 7.5	1
(CO) ₂ (PPh ₃)(η ⁵ -			(CO) Re-CH	313	1	CH ₂ OH	173.4 ± 7.3	1
C_5H_5)Cr-H	250.2 ± 4.2	1	(CO) ₅ Re-CH ₃	220 ± 8	1	$Ir(Cl)(CO)(PMe_3)_2$ -H	251	1
$(\eta^{5}-C_{5}H_{5})Cr(CO)_{3}-H,$	257	1	(10.8) Group 8			$Ir(H)(\eta^5-C_5Me_5)(PMe_3)-$	310.5 ± 21	1
Cr(CO) ₅ -H ₂	78 ± 4	1	(CO) ₄ Fe–Fe(CO) ₅	171.5	1	H	040.1	1
(P(C ₆ H ₁₁) ₃) ₂ (CO) ₃ Cr-H ₂	30.5 ± 0.4	1	(CO) ₄ Fe(H) _x -H	259.4 ± 8.4	1	Ir(Cl)(H)(CO)(PEt ₃) ₂ -H	243.1	1
$(\eta^6-C_6H_6)(CO)_3Cr-H_2$	251 ± 17	1	(η ⁵ -C ₅ H ₅)(CO) ₂ Fe-H	239	1	Ir(Cl)(H)(CO)(PPh ₃) ₂ -H		1
$Cr(CO)_5 - N_2$	81 ± 4	1	Fe(CO) ₃ (N ₂)-N ₂	37.7 ± 19.2	1	(Cl)(CO)(PPh ₃) ₂ Ir-H ₂	62.8	1
$(P(C_6H_{11})_3)_2(CO)_3Cr-N_2$	38.9 ± 0.8	1	Fe(C ₂ H ₂)(CO) ₄ -CO	88 ± 2.3	1	(Cl)(CO)(PPh ₃) ₂ Ir-CO	45.2	1
$(\eta^5-C_5Me_5)(CO)_3Cr-SH$	193	1	Fe(CO) ₂ (PMe ₃)–CO	>125	1	Ir(H)(η^5 -C ₅ Me ₅)(PMe ₃)– C ₆ H ₅	321	1
Cr(CO) ₅ -CO	154.0 ± 8.4	1	Fe(CO) ₃ (PPh ₃)-CO	$<\!177.8\pm5$	1	6 5		
Cr(CO) ₅ -CH ₄	$\sim\!33.5\pm8$	1	Fe-NH ₃	31.4 ± 4.2	1	(10.10) Group 10		
Cr-C ₆ H ₆	9.6 ± 5.8	1	Fe-CH ₂	364 ± 29	1	Ni-H ₂ O	~29	1
						Ni(CO) ₃ -N ₂	~42	1

Bond	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	Bond	$D^o_{298}/\mathrm{kJ\ mol^{-1}}$	Ref.	Bond	$D^o_{298}/\mathrm{kJ}~\mathrm{mol}^{-1}$	Ref.
Ni(CO) ₃ -CO	104.6 ± 8.4	1	Cu(C ₆ H ₆)-C ₆ H ₆	27.0 ± 19.3	1	(10.13) Group 13		
Ni-CH ₃	208 ± 8	1	Ag-CH ₃	134.1 ± 6.8	1	, , , , , , , , , , , , , , , , , , ,	172	1
$Ni-C_2H_2$	193 ± 25	1	Ag-NH ₃	8 ± 13	1	H ₃ B-BH ₃		1
$Ni-C_2H_4$	147.3 ± 17.6	1	Ag(NH ₃)-NH ₃	62.8 ± 4.2	1	H ₃ B-NH ₃	130.1 ± 4.2	_
Ni –propyne	155 ± 21	1	Au-OH	>262	1	(CH ₃) ₃ B-NH ₃	57.7 ± 1.3	1
Ni-2-butyne	121 ± 21	1	Au-NH ₃	76 ± 6	1	F ₃ B-N(CH ₃) ₃	130 ± 4.6	1
Pd-OH	213	1	Au-CH ₃	≥191.6	1	Cl ₃ B-N(CH ₃) ₃	127.6	1
$trans$ -Pt(PPh $_3$) $_2$ (Cl)-H	307 ± 37	1	Au-C ₆ H ₆	8.4	1	F ₂ B-CH ₃	397 - 418	1
$[Ph_2PCH_2]_2MePt-H$	104.6	1	(10.10) G 10			Al-OH	547 ± 13	1
$[Ph_2PCH_2]_2MePt$ -OH	167.4	1	(10.12) Group 12	=0.1.40		Al-C ₂ H ₂	>54	1
[Ph ₂ PCH ₂] ₂ MePt -SH	90.0	1	Zn-CH ₃	70 ± 10	1	Cl ₃ Al-N(CH ₃) ₃	198.7 ± 8.4	1
$Pt(\eta^5-C_5H_5)(CH_3)_2-CH_3$	163 ± 21	1	Zn(CH ₃)-CH ₃	266.5 ± 6.3	1	(CH ₃) ₃ Al-N(CH ₃) ₃	130	1
cis-Pt(PEt ₃) ₂ (CH ₃)-CH ₃	269 ± 13	1	Zn-C ₂ H ₅	92.0 ± 17.6	1	$(CH_3)_3AI-O(CH_3)_2$	92	1
			$\mathbf{Zn}(\mathbf{C}_2\mathbf{H}_5) - \mathbf{C}_2\mathbf{H}_5$	219.2 ± 8.4	1	$(CH_3)_3Ga-O(C_2H_5)_2$	50.6 ± 0.8	1
(10.11) Group 11			Cd-CH ₃	63.6 ± 10.0	1	$\mathbf{Cl_3Ga}$ - $\mathbf{S(C_2H_5)_2}$	235.1	1
Cu-OH	>406	1	Cd(CH ₃)-CH ₃	234.3 ± 6.3	1	In-CH ₃	216.3	1
Cu-CO	25 ± 5	1	Hg-CH ₃	22.6 ± 12.6	1	In(CH ₃) ₁ -CH ₃	318.8	1
Cu-CH ₃	223 ± 5	1	Hg(CH ₃)-CH ₃	239.3 ± 6.3	1	In(CH ₃) ₂ -CH ₃	587.4	1
Cu-NH ₃	47 ± 15	1	ClHg-CH ₃	280.0 ± 12.6	1	$(CH_3)_3In-N(CH_3)_3$	83.3 ± 2.1	1
Cu(NH ₃)-NH ₃	83.7 ± 4.2	1	BrHg-CH ₃	270 ± 38	1	T1-OH	330 ± 30	1
\mathbf{Cu} – $\mathbf{C}_{6}\mathbf{H}_{6}$	16.4 ± 12.5	1	IHg-CH ₃	258.6 ± 12.6	1			

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TABLE 4. Enthalpies of Formation of Free Radicals and Other Transient Species

References: Yu-Ran Luo, Comprehensive Handbook of Chemical Bond Energies, CRC Press, 2007.

Radical	Δ_{f} H $^{\circ}_{298}$ /kJ mol $^{-1}$	Ref.	Radical	$\Delta_{f}^{H^{o}}_{298}$ /kJ mol ⁻¹	
1) Carbon-Centered Species			n-C ₃ H ₇ *, n-propyl, CH ₃ CH ₂ C*H ₂	100 ± 2	
•	F0F 0 + 0 C	1	i-C ₃ H ₇ *, i-propyl, CH ₃ C*HCH ₃	88 ± 3	
CH (CH A)	595.8 ± 0.6	_	•n-C₄H₃, CH≡CCH=C•H	547.3	
CH ₂ (triplet)	391.2 ± 1.6	1	*i-C₄H₃, CH₂=C*C≡CH	499.2	
CH ₂ (singlet)	428.8 ± 1.6	1	*C₄H₅, CH₂C≡CC*H₂	304.5	
•CH ₃ , methyl	146.7 ± 0.3	1	*C₄H₅, CH≡CC*HCH₃	316.5	
•C ₂ H, acetenyl, CH≡C•	567.4 ± 2.1	1	*C,H,, *CH=CHCHCH,	364.4	
•C ₂ H ₂ , vinylidene CH ₂ =C••	419.7 ± 16.7	1	*C ₄ H _c , CH ₂ =CHC*CH ₂	313.3	
°C ₂ H ₃ , vinyl, CH ₂ =C°H	299.6 ± 3.3	1	*C ₄ H _{.,} , CH ₂ CH=CHC*H ₂	146 ± 8	
${}^{\bullet}\text{C}_{2}\text{H}_{5}$, ethyl, $\text{CH}_{3}\text{C}^{\bullet}\text{H}_{2}$	118.8 ± 1.3	1	*C ₄ H ₇ , CH ₂ =CHCH ₂ C*H ₂	192.5	
[•] C ₃ H ₃ , propargyl, CH≡CC [•] H ₂	351.9	2	*C ₄ H ₇ , CH ₂ =C(CH ₃)C*H ₂	137.9	
C ₃ H ₃ , CH ₃ C≡C	515 ± 13	1	*C ₄ H ₂ , CH ₂ =C(CH ₃)C H ₂	136.2	
${}^{\bullet}\text{C}_{\scriptscriptstyle 3}\text{H}_{\scriptscriptstyle 3}$, $\text{CH}_{\scriptscriptstyle 2}$ =C=CH ${}^{\bullet}$ \leftrightarrow CH \equiv CC ${}^{\bullet}\text{H}_{\scriptscriptstyle 2}$	351.9	2	${}^{\bullet}C_{4}H_{7}$, ${}^{\circ}C_{12}$ ${}^{\bullet}C_{11}C_{11}$ ${}^{\circ}C_{13}$	213.8 ± 6.7	
•C ₃ H ₃ , cyclopro-2-en-1-yl	439.7 ± 17.2	1	. ,	219.2 ± 4.2	
*C ₃ H ₅ , allyl, CH ₂ =CHC*H ₂	171.0 ± 3.0	1	*C ₄ H ₇ , cyclobutyl		
°C ₃ H ₅ , CH ₃ CH=C*H	267 ± 6	1	n-C ₄ H ₉ *, n-butyl, CH ₃ CH ₂ CH ₂ C*H ₂	77.8 ± 2.1	
C ₃ H ₅ , CH ₃ C=CH ₂	231.4	1	i-C ₄ H ₉ *, i-butyl, (CH ₃) ₂ CHC*H ₂	70 ± 4	
°C ₃ H ₅ , cyclopropyl	279.9 ± 10.5	1	s-C ₄ H ₉ *, s-butyl, CH ₃ C*HCH ₂ CH ₃	67.8 ± 2.1	
3 3			$t-C_4H_9^{\bullet}$, t-butyl, $(CH_3)_3C^{\bullet}$	48 ± 3	

Radical	Δ _t H° ₂₉₈ /kJ mol ⁻¹	Ref.	Radical	$\Delta_{\rm f} {\rm H^o}_{298}/{\rm kJ~mol}^{-1}$	Ref.
°C ₅ H ₃ , CH≡C-C≡CC°H ₂	579.1	1	*C ₇ H ₉ , (CH ₂ =CH) ₃ C*	274.0	1
*C₅H₃, (CH≡C)₂C*H	573.2	1	°C ₇ H ₁₁ , norborn-1-yl	136.4 ± 10.5	1
*C₅H₅, CH₂=CHC≡CC*H₂	351.5	1	°C ₇ H ₁₁ , cycloheptenyl	119.2	1
°C₅H₅, CH₂=CH-C°H-C≡CH	372.4	1	•C ₇ H ₁₃ , cycloheptyl	50.6 ± 4.2	1
*C _s H _s , cyclopenta-1,3-dien-5-yl	274.1 ± 7.3	1	*C ₇ H ₁₃ , cyclo-[C*(CH ₃)(CH ₂) ₅]	22.6	1
*C ₅ H ₂ , CH ₃ C≡CC*HCH ₃	272.8 ± 9.2	1	*C ₇ H ₁₃ , cyclo-[C*(CH ₂ CH ₃)(CH ₂) ₄]	47.0	1
°C₅H₂, CH≡CC°HC₃H₅	277.0 ± 8.4	1	*C ₇ H ₁₅ , (nC ₅ H ₁₁)(CH ₃)CH*	8.4	1
C ₅ H ₂ , CH≡CC(CH ₂) ₂	257.3 ± 9.2	1	*C ₇ H ₁₅ , (CH ₃) ₂ CHCHC*(CH ₃) ₂	-21.8 ± 5.2	1
*C ₅ H ₇ , CH ₂ =CHCH=CHC*H ₂	205.0 ± 12.6	1	°C ₈ H ₇ , cubyl	831.0 ± 16.7	1
*C ₅ H ₂ , (CH ₂ =CH) ₂ C*H	208.0 ± 4.2	1	*C ₈ H ₇ , C ₆ H ₅ C*=CH ₂	309.6	1
*C ₅ H ₇ , CH ₃ CH=C=CHC*H ₂	278.0	1	*C ₈ H ₇ C ₆ H ₅ CH=CH*	387.0	1
*C ₅ H ₇ , spiropentyl	380.7 ± 4.2	1	*C ₈ H ₆ , C ₆ H ₅ C*H(CH ₃)	175.7 ± 7.5	1
*C ₅ H ₇ , cyclopent-1-en-3-yl	160.7 ± 4.2	1	*C _s H _s , C _s H _s CH ₃ C*H ₃	236.0 ± 7.5	1
*C ₅ H _o , cyclopentyl	105.9 ± 4.2	1	*C ₈ H ₆ , p-CH ₃ C ₆ H ₄ C*H ₇	167.4	1
*C ₅ H _o , CH ₂ =CHC*HCH ₂ CH ₃	109.6 ± 8.4	1	*C ₈ H ₉ , m-CH ₃ C ₆ H ₄ C*H ₂	167.4	1
*C _E H _o , CH ₃ CH=CHC*H(CH ₃)	92	1	*C ₈ H ₆ , o-CH ₃ C ₆ H ₄ C*H ₇	167.4	1
*C ₅ H ₂ , CH ₃ CH=C(CH ₃)C*H ₂	92.0	1	*C _s H _o , 1-vinyl-cyclohexa-2,4-dienyl	247.7 ± 14.2	1
C ₅ H ₉ , CH ₂ =CHC(CH ₃) ₂	87.0 ± 8.4	1	*C _o H _o , 2-vinyl-cyclohexa-2,4-dienyl	249.8 ± 14.2	1
*C ₅ H ₉ , CH ₂ =C(CH ₃)C*H(CH ₃)	93.7	1	°C ₈ H _o , 3-vinyl-cyclohexa-2,4-dienyl	269.4 ± 14.2	1
*C ₅ H ₉ , CH ₂ =C(C*H ₂)CH ₂ CH ₃	114.2	1	*C _o H _o , 6-vinyl-cyclohexa-2,4-dienyl	284.5 ± 14.2	1
•C ₅ H ₉ , CH ₂ =CH(CH ₂) ₂ C•H ₂	179.5	1	*C ₈ H ₁₃ , CH ₂ =CHCH=CHC*H(CH ₂) ₂ CH ₃	130.5	1
nC ₅ H ₁₁ •, CH ₃ CH ₂ CH ₂ CH ₂ C•H ₂	54.4	1	*C ₈ H ₁₂ , CH ₂ =CHC*H(CH ₂) ₃ CH=CH ₂	130.5	1
*C ₅ H ₁₁ , (C ₂ H ₅) ₂ C*H	47.0	1	*C ₈ H ₁₃ , bicyclooct-1-yl	92.0	1
*C ₅ H ₁₁ , (nC ₃ H ₇)(CH ₃)C*H	50.2	1	*C ₈ H ₁₅ , CH ₂ =CHC*H(CH ₂) ₄ CH ₃	49.8	1
*C ₅ H ₁₁ , (CH ₃) ₃ C*CH ₂	36.4 ± 8.4	1	*C ₈ H ₁₅ , (E)-CH ₃ CH=C*(CH ₂) ₄ CH ₃	29.7	1
C ₅ H ₁₁ , (C ₂ H ₅)(CH ₃) ₂ C	29	1	*C ₈ H ₁₅ , (Z)-(CH ₃) ₂ C*CH=CHCH(CH ₃) ₂	9.2	1
${}^{\bullet}C_{_{6}}H_{_{5}}$, phenyl	330.1 ± 3.3	1	*C ₈ H ₁₅ , cyclooctanyl	59.4	1
°C ₆ H ₇ , cyclohexa-1,3-dien-5-yl	199.2	1	*C ₈ H ₁₅ , cyclo-[C*(CH ₂ CH ₃)(CH ₂) ₅]	10.0	1
°C ₆ H ₇ , cyclohexa-1,4-dien-3-yl	208.0 ± 3.9	5	°C ₉ H ₇ , indenyl	297.1	1
${}^{\bullet}C_6H_9$, $CH_3C\equiv CC^{\bullet}(CH_3)_2$	221.8 ± 9.2	1	°C ₉ H ₉ , indanyl-1	204.2 ± 8.4	1
C ₆ H ₉ , (CH ₂ =CH) ₂ C(CH ₃)	193.7	1	°C ₉ H ₁₁ , 2,6-dimethylbenzyl	124.7	1
°C ₆ H ₉ , cyclohexa-1-en-3-yl	119.7	1	°C ₉ H ₁₁ , 3,6-dimethylbenzyl	124.7	1
${}^{\bullet}C_{6}H_{11}$, $CH_{2}=CH(CH_{2})_{3}C^{\bullet}H_{2}$	158.6	1	°C ₉ H ₁₁ , 3,5-dimethylbenzyl	124.7	1
${}^{\bullet}C_{6}H_{11}$, $CH_{2}=CHC^{\bullet}H(CH_{2})_{2}CH_{3}$	89.0	1	*C ₉ H ₁₁ , C ₆ H ₅ C*(CH ₃) ₂	133.9 ± 4.2	1
${}^{\bullet}C_{6}H_{11}$, $CH_{2}=C(CH_{3})C^{\bullet}(CH_{3})_{2}$	37.7 ± 6.3	1	*C ₉ H ₁₁ , o-*C ₆ H ₄ C ₂ H ₅	279.5 ± 7.5	1
[*] C ₆ H ₁₁ , (CH ₃) ₂ C=C(CH ₃)C [*] H ₂	39.7 ± 6.3	1	°C ₉ H ₁₇ , cyclononanyl	52.3	1
*C ₆ H ₁₁ , (CH ₃) ₂ C=CHC*H(CH ₃)	47.3	1	°C ₁₀ H ₇ , naphth-1-yl	401.7 ± 5.4	1
[•] C ₆ H ₁₁ , (Z)-CH ₃ CH=CHC [•] (CH ₃) ₂	54.4	1	*C ₁₀ H ₇ , naphth-2-yl	400.4 ± 5.9	1
°C ₆ H ₁₁ , cyclohexyl	75.3 ± 6.3	1	*C ₁₀ H ₁₁ , tetralin-1-yl	154.8 ± 5.0	1
nC_6H_{13} , $CH_3CH_2CH_2CH_2CH_2C$	33.5	1	°C ₁₀ H ₁₃ , 1-phenyl-but-4-yl	192.0	1
${}^{\bullet}C_{_{6}}H_{_{13}}$, $(nC_{_{4}}H_{_{9}})(CH_{_{3}})C^{\bullet}H$	29.3	1	*C ₁₀ H ₁₃ , (C ₆ H ₅ CH ₂)(C ₂ H ₅)C*H	184.5	1
°C ₆ H ₁₃ , 2-methyl-2-pentyl	3.3 ± 8.4	1	•C ₁₀ H ₁₃ , (C ₆ H ₅ CH ₂ CH ₂)(CH ₃)C•H	184.5	1
°C ₆ H ₁₃ , 3-methyl-3-pentyl	14.2	1	*C ₁₀ H ₁₃ , (C ₆ H ₅ C*HCH ₂ CH ₂ CH ₃	134.7	1
°C ₆ H ₁₃ , 2,3-dimethyl-2-butyl	3.1 ± 10	1	°C ₁₀ H ₁₅ , 1-adamantyl	51.5	1
C ₇ H ₃ , (CH≡C) ₃ C	784.5	1	°C ₁₀ H ₁₅ , 2-adamantyl	61.9	1
${}^{\bullet}\text{C}_{7}\text{H}_{7}$, benzyl, $\text{C}_{6}\text{H}_{5}\text{C}{}^{\bullet}\text{H}_{2}$	208.0 ± 1.7	1	*C ₁₀ H ₁₉ , cyclodecanyl	32.2	1
•C ₇ H ₇ , quadricyclolan-5-yl	578.6 ± 5.4	1	°C ₁₁ H ₉ , 1-naphthylmethyl	252.7	1
${}^{ullet}C_{_{7}}H_{_{7}}$, quadricyclolan-4-yl	587.4 ± 5.4	1	*C ₁₁ H ₂₁ , cycloundecanyl	7.5	1
${}^{\bullet}\mathrm{C_{7}H_{7}}$, norborna-2,5-dien-7-yl	511.7 ± 7.9	1	*C ₁₂ H ₂₃ , cyclododecanyl	-38.5	1
${}^{\bullet}\mathrm{C_{7}H_{7}}$, cyclohepta-1,3,5-trien-7-yl	285.3 ± 12.6	1	°C ₁₃ H ₉ , 9-fluorenyl	297.5	1
${}^{\bullet}C_{7}H_{9}$, $CH_{2}=CH(CH=CH)_{2}CC^{\bullet}H_{2}$	251.0	1	*C ₁₃ H ₁₁ , (C ₆ H ₅) ₂ C*H	302.1 ± 4.2	1

Radical	ΔH ^o ₂₉₈ /kJ mol ⁻¹	Ref.	Radical	$\Delta_{\rm p}$ H $^{ m o}_{298}$ /kJ mol $^{-1}$	Ref.
°C ₁₃ H ₁₁ , 9-methyl-9-fluorenyl	268.2	1	°C ₂ HF ₄ , CHF ₂ C°F ₂	-664.8	1
*C ₁₄ H ₁₁ , 9,10-dihydroanthracen-9-yl	261.0	1	*C ₂ H ₂ F ₃ , CF ₃ C*H ₂	-517.1 ± 8.4	1
°C ₁₅ H ₁₁ , 9-anthracenylmethyl	337.6	1	°C ₂ H ₂ F ₃ , CHF ₂ C°HF	-456.0	1
°C ₁₅ H ₁₁ , 9-phenanthrenylmethyl	311.3	1	*C ₂ H ₂ F ₃ , CH ₂ FC*F ₂	-449.8	1
*C ₁₆ H ₃₁ , CH ₂ =CHC*H(CH ₂) ₁₂ CH ₃	-118.8	1	*C,H,F,Cl, CF,ClC*H,	-310.9 ± 7.0	1
C ₁₉ H ₁₅ , trityl, (C ₆ H ₅) ₃ C	392.0 ± 8.4	1	*C ₂ H ₃ F ₂ , CH ₃ C*F ₂	-302.5 ± 8.4	1
*C ₃₅ H ₂₅ , pentamethylcyclopentadienyl	67.4	1	*C ₂ H ₃ F ₂ , CHF ₂ C*H ₂	-285.8	1
CF	255.2 ± 8	1	*C ₂ H ₃ F ₃ , CH ₃ FC*HF	-238.5	1
CF,	-182.0 ± 6.3	1	*C ₂ H ₄ F, CH ₃ C*HF	-70.3 ± 8.4	1
FC*(O)	-161.2 ± 8.4	1	*C ₂ H ₄ F, CH ₂ FC*H ₂	-59.4 ± 8.4	1
CHF	143.0 ± 12.6	1	*C ₂ H ₂ F ₂ Cl, CF ₂ ClC*H ₂	-315.2 ± 6	1
CCIF	31.0 ± 13.4	1	*C,F ₄ Cl, CF,ClC*F,	-686.0	1
CCl	443.1 ± 13.0	1	*C,HF,Cl, CClF,C*HF	-450.6 ± 12.6	1
CCl ₂	226	1	*C ₂ F ₄ Cl, CF ₃ C*FCl	-728.0	1
CIC*(O)	-21.8 ± 2.5	1	*C,F,Cl,, CF,C*Cl,	-564.0	1
CHCl	326.4 ± 8.4	1	*C ₂ F ₃ ClBr, CF ₃ C*ClBr	-504.2 ± 8.4	1
CClBr	267	1	°C₂Cl, ClC≡C°	534 ± 50	1
CBr	510 ± 63	1	*C ₂ Cl ₃ , CCl ₂ =C*Cl	190 ± 50	1
CHBr	373 ± 18	1	*C ₂ Cl ₃ , CCl ₃ C*Cl ₂	35.1 ± 5.4	1
CBr ₂	343.5	1	·C ₂ HCl ₄ , CHCl ₂ C·Cl ₂	23.4 ± 8.4	1
CI	570 ± 35	1	·C ₂ HCl ₄ , CCl ₃ C·HCl	51.0	1
${ m CI}_2$	468 ± 60	1	·C ₂ H ₂ Cl ₃ , CH ₂ ClC·Cl ₂	26.4	1
*CF ₃	-465.7 ± 2.1	1	·C,H,Cl,, CHCl,C·HCl	46.4	1
*CHF,	-238.9 ± 4.2	1	•C ₂ H ₂ Cl ₃ , CCl ₃ C•H ₂	71.5 ± 8	1
*CH,F	-31.8 ± 4.2	1	*C ₂ H ₃ Cl ₂ , CH ₃ C*Cl ₂	42.5 ± 1.7	1
*CCIF,	-279.0 ± 8.4	1	•C ₂ H ₃ Cl ₂ , CH ₂ ClC•ClH	65.3	1
*CCl,F	-89.0 ± 8.4	1	•C ₂ H ₃ Cl ₂ , CHCl ₂ C•H ₂	90.1 ± 0.8	1
*CBrClF	-35.5 ± 6.3	1	*C ₃ H ₄ Cl, CH ₃ C*HCl	76.5 ± 1.6	1
*CHClF	-60.7 ± 10.0	1	*C,H,Cl,CH,ClC*H,	93.0 ± 2.4	1
*CBrF,	-224.7 ± 12.6	1	*C ₂ H ₃ Br ₂ , CH ₃ C*Br ₂	140.2 ± 5.4	1
*CCl ₃	71.1 ± 2.5	1	*C ₂ H ₄ Br, BrCH ₂ C*H ₂	135.1	1
*CHCl	87.1 ± 1.6	1	*C ₃ H ₄ Br, CH ₃ C*HBr	133.4 ± 3.4	3
*CH,Cl	117.2 ± 2.9	1	*C ₃ Br, CBrC*	623.8	1
•CHBrCl	140 ± 4	1	*C,Br,, CBr,C*Br	385.3	1
•CHBr ₂	199.1 ± 2.7	3	*C ₂ Br ₅ , CBr ₃ C*Br ₂	283.3	1
*CBr ₂ Cl	163 ± 8	1	*C ₃ H ₆ Cl, CH ₃ CH ₂ C*HCl	56.6	1
*CBrCl,	124 ± 8	1	*C ₃ H ₆ Cl, CH ₃ C*ClCH ₃	29.9 ± 0.6	1
*CBr ₃	214.8	1	*C ₃ H ₆ Br, C*H ₂ CH ₂ CH ₂ Br	120.1 ± 1.3	1
•CH ₂ Br	171.1 ± 2.7	1	*C ₃ H ₆ Br, CH ₃ C*HCH ₂ Br	96.7 ± 5.9	1
*CI ₃	424.9 ± 2.8	1	•C ₄ H ₆ Br, CH ₃ CH ₂ C•HBr	107.5 ± 2.5	1
•CHI,	314.4 ± 3.3	1	*C ₆ F ₅	-547.7 ± 8.4	1
*CH ₂ I	229.7 ± 8.4	1	•CH ₂ O, HOC•H ₂	-17.0 ± 0.7	1
°C,F, FC≡C°	460.0 ± 21.0	1	•CH ₂ ClO, HOC•ClH	-60.7 ± 7.5	1
C,Cl, ClC≡C	568 ± 26	1	*CHCl ₂ O, HOC*Cl ₂	-94.1 ± 7.5	1
*C ₂ F ₃ , CF ₂ =C*F	-192.0 ± 8.4	1	•CH,ClO, ClOC•H,	135.6 ± 9.2	1
*C ₂ F ₂ H, CF ₂ =C*H	-92.9 ± 8.4	1	*CH ₂ BrO, BrOC*H ₂	151 ± 16	1
*C ₂ F ₂ H, CHF=C*F	-52.9 ± 8.4 -50.6 ± 8.4	1	*C,H,O, C*H=CHOH	131 ± 10 121 ± 11	1
*CCl ₂ H, CHCl=C*Cl	-30.0 ± 8.4 234.7 ± 8.4	1	*C,H,O,C*H,CHO	13.0 ± 2	1
*CClH ₂ , CH ₂ =C*Cl	>254.7 ± 8.4	1	*C ₂ H ₅ O, CH ₃ C*HOH	-54.0	1
*C ₂ F ₅ , CF ₃ C*F ₂	-892.9 ± 4.2	1	*C ₂ H ₄ ClO, CH ₃ C*ClOH	-34.0 -108.4 ± 8.8	1
°C,HF ₄ , CF ₃ C°HF	-892.9 ± 4.2 -680.8 ± 9.6	1	*C ₂ H ₄ ClO, C*H ₂ CHClOH	-108.4 ± 8.8 -73.2 ± 8.8	1
21114, 0130111	-000.0 ± 7.0	1	C_2 C_4 C_1 C_2 C_1	-/3.2 ± 0.0	1

C,H,Q,C,CH,CH,OH -906.188 1 IPIC(IOCKCH,) -1736.120.9 1 C,H,Q,C,H,CH,OH 31±7 1 IC,H,CIOCH, -1155.126 1 C,H,Q,CH,CHCHOH 0±8.4 1 PRC(IOCH, 41.4±20.9 1 C,HQ,CH,CHCHOH -81±4 1 PRC(IOCH,E) 41.4±20.9 1 C,HQ,CH,CHCHOH -81±4 1 PRC(IOCH,E) 41.4±20.9 1 C,HQ,CH,CH,CH, -66.9±84 1 **C(IOIOCH,E) -69.9 1 C,HQ,CH,CHOHCH, -66.9±84 1 **C(IOIOCH,E) -219.6±2.9 1 C,HQ,CH,CHOHCH, -68.2±11.7 1 **C(IOIOCH,E) -246.6±2.9 1 C,HQ,CH,CHOHCH, -82.2±8.4 1 **CH(ICH)COOH -239±3 1 MC,CHO,CH, 152.3±6.3 1 **CH,CHOOH -230±8.4 1 C,HQ,CH,CHOCH, -152.3±6.3 1 **CH,CHOOHCH, -280.1 1 C,HQ,CHCHOCH, -152.48.4 1 **CH,COOHCH, -82.2±8.4 1	Radical	$\Delta_{\rm f}$ H $^{ m o}_{298}$ /kJ mol $^{-1}$	Ref.	Radical	ΔH ^o ₂₉₈ /kJ mol ⁻¹	Ref.
СДО, оплато-2-уі 1498.2 6.3 1 РЕСОЮСН, 1 84.5 ± 12.6 1 СДО, СДСН, СПОНО 0±84 1 РЕСОЮСНСН, 4 4.4 ± 20.9 1 СДО, СН, СПСНОН -88±4 1 РЕСОЮСН, 1 -09.9 1 СДО, ОСНДСИ, СМ, - -66.9 ± 84 1 **C(О)ОН-108 ≥-1946 ± 2.9 1 СДО, ОСНДСИ, СМ, - -66.9 ± 84 1 **C(О)ОН-108 ≥-1946 ± 2.9 1 СДО, ОСНДСИ, СМ, - -66.9 ± 84 1 **C(О)ОСН, - -16.5 1 СДО, ОСНДСИВ(Н), - -62.8 ± 11.7 1 **C(О)ОСН, - -16.5 1 СДО, СНДОСИ, - -10.4 ± 2 1 **CНДОООН, - -28.9 ± 12.0 1 СДО, СНДОСН, - -152.3 ± 6.3 1 **CНДОООН, - -28.0 ± 12.6 1 СДО, СНДОСН, - -152.3 ± 6.3 1 **CНДОООН, - -28.0 ± 12.6 1 СДО, СНДОСН, - -577.1 ± 8.4 1 **CНДОООН, - -28.0 ± 12.6 1 СДО, СНДОСН, ОСН, - -71.4 ± 2 1 **C	°C,H,Cl,O, C°H,CCl,OH	,		iPrC(O)C•(CH ₃) ₂	*	
СРДОСН-ЭСИСНОН 0.8.4 1 PROCOCHICH, CH, CH, CH, CH, CH, CH, CH, CH, CH,		-31 ± 7	1	$tC_4H_9C(O)C^{\bullet}H_2$	-115.5 ± 12.6	1
СДН,О. СН,СН,СНОН -81±4 1 PRCHCIOCH,PR 1343±20.9 1 СДН,О. НОСН,СН,СН, -669 + 84 1 PICCIOCH, CHOR, -669 + 84 1 **C(IO)OH-trans 2-1946±2.9 1 СДН,О. СН,СНОВСН, -669 + 84 1 **C(IO)OH-trans 2-1946±2.9 1 СДН,О. СН,СНОВОН, -628±11.7 1 **C(IO)OCH, -161.5 1 СДН,О. СН,СНОВОН, -1473±84 1 **CH,COIOOH -2489±12.0 1 РВ,СОН,О. 1096±42 1 **CH,COIOCH, -2368±8.4 1 РВ,СОН 1523±6.3 1 **CH,COIOCH, -260.2±12.6 1 СДН,О.СН,ОСН, -642 1 **CH,COIOCH, -260.2±12.6 1 СДН,О.СН,ОСН,ОСН, -421.2 1 **CH,COIOCH, -280.2±12.6 1 СДН,О.СН,ОСН,ОСН, -422.4 1 **CH,COIOCH, -183.1 1 СДН,О.СН,ОСН,ОСН, -7.3±2.1 1 **CH,O.O.CH,CH,O.CH,O. -33.0 1 СДН,О.СН,ОСН,ОСН,ОСН, -81.2	•C ₂ H ₃ O, oxiran-2-yl	149.8 ± 6.3	1	PhC(O)C•H ₂	84.5 ± 12.6	1
C, H, O, CH, CH, CHCH, C	*C ₃ H ₅ O,CH ₂ =CHC*HOH	0 ± 8.4	1	PhC(O)C•HCH ₃	41.4 ± 20.9	1
C, H, D, C, CH, D, CH, CH, CH -78.7 ± 8.4 1 Ph(C) OCH, CH -60.9 1 *C, H, D, CHC, CH, CH, CH -66.9 ± 8.4 1 *C(O)OH-trans ≥-1916 ± 2.9 1 *C, H, D, CH, CHO, CHO		-81 ± 4	1	PhC*HC(O)CH,Ph	134.3 ± 20.9	1
C,H,O,HOCH,CH,CH, CH,D,CCH,CHOHOCH, CH,D,CCH,CHOHOCH, CH,D,CCH,CHOHOCH, CH,D,CCH,CHOHOCH, CH,D,CCH,CHOHOCH, CH,D,CCH,CHOHOCH, CH,D,CCH,CHOHOCH, CH,D,CCH,CHOHOCH, CH,D,CCH,CHOHOCH, CH,D,CCH,CHOCH CH,D,CCH,CHOCH CH,D,CCH,CHOCH, CH,D,CCH,CCH, CH,D,CCH,CCH, CH,D,CCH,CCH, CH,D,CCH,CCH, CH,D,CCH,CCH, CH,D,CCH,CCH, CH,D,CCH,CCH, CH,D,CCH,CCH, CH,D,CCH,CCH, CH,D,CCH,CCH, CH,D,CCH,CCH, CH,D,CCH,CCH, CH,D,CCH,CH,CCH, CH,D,CCH,CCH, CH,D,CCH,CH,CCH, CH,D,CCH,CH,CCH, CH,D,CCH,CH,CCH, CH,D,CCH,CCH, CH,D,CCH,CH,CCH,CH, CH,D,CCH,CH,CCH,CH, CH,D,CCH,CH,CCH,CH,CH,CH,CH,CH,CH,CH,CH,CH,C		-78.7 ± 8.4	1	PhC(O)OC•H,	-69.9	1
C, H, O, (CH), (CH), (CH) -964 1 C(O)OH-cis -2197 1 'C,H,O, 'CH, (CH)(CH)(H) -628±11.7 1 C(O)OCH, -161.5 1 'C,H,O, 'CH, (CH)(CH)(H), -1473±84 1 CH, (CO)OCH, -238±3 1 'C,H,O, CH,OCH,OOH 193±63 1 CH, (CO)OCH, -2368±4 1 'C,H,O, CH,OCH, 0±42 1 CH, (CO)OCH, -28.0 1 'C,H,O, CH,OCHCH, -57.7±84 1 'CH, (O, CH)OCH, -18.0±63 1 'C,H,O, CH, CH,OCH, -57.7±84 1 'CH,O, CH, CH,OCH, -18.2±84 1 'C,H,O, CH, CH,OCH, -7.1±42 1 'C,H,O, CH,OCH,OCH, -31.8±12.6 1 'C,H,O, CH,CH,OCH, -81.2±42 1 'C,H,O, 2-CO)OH-CH, -33.0 1 'C,H,O, CH,CH,OCH, -81.2±42 1 'C,H,O, 2-CH,OCH-CH, -33.0 1 'C,H,O, CH,CH(CH)OCH, -81.2±42 1 'C,H,O, 2-CH,CHOCH, -33.0 1 'C,H,O, CH,CH(CH)OCH, -82.3±8 1		-66.9 ± 8.4	1	•C(O)OH-trans	≥-194.6 ± 2.9	1
C,H,O, CH,C(OH)(CH,J) -147.3 ± 84 1 CH,C(O)OH -248.9 ± 12.0 1 C,H,O, C,H,OCH,OOH 109.6 ± 42 1 CH(CH,J)C(O)OH -293.1 a 1 Ph,COH 152.3 ± 6.3 1 CH,C(O)OCH, -236.8 ± 8.4 1 C,H,O,CH,OCH, 0.2 ± 2.2 1 CH,C(O)OCH, -260.2 ± 12.6 1 C,H,O,CH,OCH, -57.7 ± 8.4 1 CH,C(O)OPh -28.0 1 C,H,O,CH,CH,OCH, -57.2 ± 8.4 1 CH,C(O)OPh -18.0 ± 6.3 1 C,H,O,CH,CH,OCH, -71.2 ± 2 1 C,H,O, cyclopentanon-2-yl -18.0 ± 6.3 1 C,H,O,CH,CH,OCH, -70.2 ± 8.4 1 C,H,O, 2-C(O)OH-C,H, -33.0 1 C,H,O,CH,CH,OCH, -70.2 ± 1.2 1 C,H,O, 2-C(O)OH-C,H, -33.0 1 C,H,O,CH,CH,OCH, -81.2 ± 2.1 1 C,H,O, 2-C(O)OH-C,H, -35.0 1 C,H,O,CH,CH,OCH, -72.4 ± 10 1 C,H,O, 2-C(O)OH-C,H, -33.0 1 C,H,O,CH,CH,OCH, -72.4 ± 10		-96.4	1	*C(O)OH-cis	-219.7	1
C ₁ H ₁ O ₉ CH ₁ OCH ₂ OOH 109.6±4.2 1 CH(CH) ₂ C(O)OH -293±3 1 PhCPOH 293±8.4 1 CH ₂ C(O)OCH ₂ -226.8±8.4 1 Ph, COH 1523±6.3 1 CH ₂ C(O)OCH ₂ CH ₃ -226.0±12.6 1 C,H ₂ O, CH ₂ OCH ₃ OCH ₄ 0±42 1 CH ₂ C(O)OCH ₂ CH ₃ -28.0 1 C,H ₃ O, CH ₂ OCH ₄ OCH ₄ -57.±8.4 1 CH ₂ (O)OCH ₂ Celpotentano-2-yl -41.8±12.6 1 C,H ₃ O, CH ₄ CH ₂ OCH ₄ -71.±42 1 CH ₂ O ₂ OCH ₂ -Clopentano-2-yl -41.8±12.6 1 C,H ₃ O, CH ₄ CH ₂ OCH ₄ -70.3±7.1 1 CH ₂ O ₂ OCH ₂ -ClOpOH-CH ₄ -33.0 1 C,H ₃ O, CH ₄ OCH ₄ OCH ₄ -81.2±4.2 1 CH ₂ O ₂ OCH ₂ COOH-CH ₄ -36.0 1 C,H ₃ O, CH ₄ OCH ₄ OCH ₄ -81.2±4.2 1 CH ₂ O ₂ OCH ₂ OOH 66.1 1 C,H ₃ O, CH ₄ OCH ₂ OCH ₄ -72±10 1 CH ₂ O ₂ OCH ₂ OCH ₂ OOH 66.1 1 C,H ₃ O, CH ₂ OCH ₂ OCH ₄ OCH ₂ OCH -102±5±4.8 1 CH ₂ O ₂ OCH ₂ OCH ₂ OOH <	*C ₃ H ₂ O, *CH,CH(OH)CH ₃	-62.8 ± 11.7	1	*C(O)OCH ₃	-161.5	1
Ph.CH'OH	*C ₄ H ₉ O, *CH ₂ C(OH)(CH ₃) ₂	-147.3 ± 8.4	1	C*H,C(O)OH	-248.9 ± 12.0	1
Ph,COH 1523±63 1 CH,CO)OCH,CH,GH,CH,GH,CH,GH,GH,GH -2602±12.6 1 C,H,O,CH,OCH,GH,GH,GH,GH,GH,GH,GH,GH,GH,GH,GH,GH,GH	*C,H5O3, C*H,OCH,OOH	109.6 ± 4.2	1	C•H(CH ₃)C(O)OH	-293 ± 3	1
C,H,O, CH,OCH, 0 ± 4.2 1 CH,CO)OPh -28.0 1 C,H,O, CH,OCHCH ₃ -57.7 ± 8.4 1 C,H,O, tetralydrofuran-2-yl -18.0 ± 6.3 1 C,H,O, CH,OCH,OCH ₃ -7.1 ± 4.2 1 C,H,O, cyclopentanon-2-yl -41.8 ± 12.6 1 C,H,O, CH,CH,OCH ₃ -7.1 ± 4.2 1 C,H,O,2 +(C)O)H-C,H ₄ -33.0 1 C,H,O, CH,CH,CHCH ₃ -81.2 ± 4.2 1 C,H,O,2 -C(O)OH-C,H ₄ -33.0 1 C,H,O, CH,CH,CHCH ₃ -42.3 ± 3.8 1 C,H,O,2 -C(O)OH-C,H ₄ -35.0 1 C,H,O, CH,CHCH ₃ OCOCH ₄ -72.4 ± 10 1 CH,O,2 -CH,OH 66.1 1 C,H,O, CH,CHCHOH -22.3 ± 8.4 1 C,H,O,2 -CH,CHOH 46.0 ± 4.6 1 C,H,O, CH,CHCHOH -220.1 ± 8.4 1 C,H,O,2 -CH,CHCOHOH 40.9 ± 5.4 1 C,H,O, CH,CHCHOH -220.1 ± 8.4 1 C,H,O,2 -CH,CHCOHOH 40.9 ± 5.4 1 C,H,O, CH,CHCHOH -220.1 ± 8.4 1 C,H,O,2 -CH,CHCOHOH 20.9 ± 5.4 1 <tr< td=""><td>PhCH*OH</td><td>29.3 ± 8.4</td><td>1</td><td>C•H,C(O)OCH,</td><td>-236.8 ± 8.4</td><td>1</td></tr<>	PhCH*OH	29.3 ± 8.4	1	C•H,C(O)OCH,	-236.8 ± 8.4	1
C,H,O, CH,OCH,CH,OCH,CH,OCH,CH,OCH,CH,OCH,CH,OCH,CH,OCH,CH,OCH,CH,OCH,CH,OCH,CH,OCH,CH,OCH,CH,OCH,CH,OCH,CH,CH,CH,OCH,CH,CH,CH,CH,CH,CH,CH,CH,CH,CH,CH,CH,C	Ph,C*OH	152.3 ± 6.3	1	C*H,C(O)OCH,CH,	-260.2 ± 12.6	1
C,H,O, CH,O, CH, CH,OCH, -57.7 ± 8.4 1 'C,H,O, tetrahydrofuran-2-yl -18.0 ± 6.3 1 C,H,O, CH,CH,OCH, -45.2 ± 8.4 1 'C,H,O, yelopentanon-2-yl -41.8 ± 12.6 1 C,H,O, CH,CH,OCH, -7.1 ± 4.2 1 'C,H,O, yelopentanon-2-yl -131.8 ± 12.6 1 C,H,O, CH,CH,OCHOCH, -70.3 ± 7.1 1 'C,H,O, yelopentanon-2-yl -33.0 1 C,H,O, CH,CH,OCHOCH, -81.2 ± 4.2 1 'C,H,O, yelopentanon-2-yl -33.0 1 C,H,O, CH,CH,OCHOCH, -81.2 ± 4.2 1 'C,H,O, yelcOOH,** -36.0 1 C,H,O, CH,CHOOCH, -724 ± 10 1 'CH,O, yelCOOH,** 66.1 1 C,H,O, CH,OHOH -220.1 ± 8.4 1 'C,H,O, yell,OOH 66.1 1 C,H,O, D, HOCH,CHOH -220.1 ± 8.4 1 'C,H,O, yell,CHOOH 26.9 1 C,H,O, O, HOCH,CHOH -220.1 ± 8.4 1 'C,H,O, yell,CHO,OOH 26.9 1 CH-C-CO, beetenyl 177.5 ± 8.8 1 'C,H,O, yell,CHO,OOH 20.1 ± 5.4 1<	*C,H5O, CH3OC*H,	0 ± 4.2	1	C*H,C(O)OPh	-28.0	1
C ₁ H ₁ O, CH ₂ CH ₂ OCH ₂ -45.2 ± 8.4 1 C ₁ H ₂ O, cyclopentanon-2·yl -41.8 ± 12.6 1 C ₁ H ₂ O, CH ₂ CH ₂ CH ₃ -7.1 ± 4.2 1 C ₁ H ₂ O ₂ Ld-dioxan-2·yl -131.8 ± 12.6 1 C ₁ H ₂ O, CH ₂ CHOCH ₃ -70.3 ± 7.1 1 C ₁ H ₂ O ₂ -2-C(O)OH·C ₁ H ₃ -33.0 1 C ₂ H ₂ O, CH ₃ CHOCH ₃ -81.2 ± 4.2 1 C ₂ H ₂ O ₂ -4C(O)OH·C ₂ H ₄ -35.0 1 C ₂ H ₃ O, CH ₃ CHOCH ₃ -42.3 ± 3.8 1 C ₂ H ₂ O ₂ CH ₂ CHOOH 66.1 1 C ₂ H ₃ O, CH ₃ COCH ₃ -72.4 ± 10 1 CH ₂ O ₂ CH ₃ CHOOH 66.1 1 C ₂ H ₃ O, CH ₃ COCH ₃ -10.5 ± 8.4 1 C ₂ H ₂ O ₂ CH ₃ CHOOH 46.0 ± 4.6 1 C ₂ H ₃ O, CH ₃ COCH ₃ -10.5 ± 8.4 1 C ₂ H ₂ O ₂ CH ₃ CHOOH 46.0 ± 4.6 1 C ₂ H ₃ O, CH ₃ COCH ₃ -10.5 ± 8.8 1 C ₂ H ₂ O ₂ CH ₃ CHOOH 26.9 1 CH-C ₂ O ₃ Cestenyl 177.5 ± 8.8 1 C ₂ H ₂ O ₂ CH ₂ CHOOH 26.3 1 CH ₂ O ₃ Cestenyl 17.5 ± 8.8		-57.7 ± 8.4	1	*C ₄ H ₇ O, tetrahydrofuran-2-yl	-18.0 ± 6.3	1
C,H,O, CH, CH, CH, CH, CH, CH, CH, CH, CH, CH		-45.2 ± 8.4	1		-41.8 ± 12.6	1
CH,O, (CH) ₂ CHOCH ₂ -70.3±7.1 1 CH,O, CH,OCH-CH ₄ -33.0 1 CH,O, CH,OCHCH ₃ -81.2±4.2 1 CH,O, 3-C(O)OH-CH ₄ -35.0 1 CH,O, CH,CH,OCHCH ₃ -81.2±4.2 1 CH,O ₂ -CH(O)OH-CH ₄ -35.0 1 CH,O, CH,OCHCH ₃ OCH ₄ -42.3±3.8 1 CH,O ₂ -CH,OOH 66.1 1 CH,O, CH,OCH ₃ COCH ₄ -72.4±10 1 CH _O ₂ -CH,ODOH 66.1 1 CH,O, CH,O, HOCH ₂ CHOH -220.1±8.4 1 CH _O ₂ -CH,CHOOH 26.9 1 CH-C=O, ketenyl 177.5±8.8 1 CH,O ₂ -CH,CHOOHCH ₂ 29.56.3 1 CH-C=O, ketenyl 177.5±8.8 1 CH,O ₂ -CH,CHOOHCH ₂ 29.56.3 1 CH-CO 425.±0.5 1 CH,O ₂ -CH,CHOOHCH ₂ 29.56.3 1 CH-CO 425.±0.5 1 CH,O ₂ -CH,CHOOHCH ₂ 29.56.3 1 CH-CO 425.±0.5 1 CH,O ₂ -CH,CHOOHCH ₂ 29.56.3 1 CH-CO 425.±0.5 1		-7.1 ± 4.2	1		-131.8 ± 12.6	1
C,H,O, CH,GH,OCHGH, -81.2 ± 4.2 1 C,H,O, CH,OCH,GH,GOCH, -35.0 1 C,H,O, CH,CHCH,OCH,OCH, -42.3 ± 3.8 1 C,H,O, C+C(O)OH-C,H, -36.0 1 C,H,O, CH,J,COCH, -72.4 ± 10 1 CH,O, CH,OOH -66.1 1 C,H,O, CH,J,COCH, -102.5 ± 8.4 1 CH,O, CH,CH,OOH 46.0 ± 4.6 1 C,H,O, HOCH,CHOH -220.1 ± 8.4 1 C,H,O, CH,CHCH,OOH 10.9 ± 5.4 1 CH-C-O, ketenyl 177.5 ± 8.8 1 C,H,O, CH,CHCH,OOH 10.9 ± 5.4 1 HC'(0) 42.5 ± 0.5 1 C,H,O, CH,J,CH(OOH)CH, 2.9 ± 6.3 1 CCO 381.2 ± 2.1 1 C,H,O, CH,J,CH(OOH)CH, 2.9 ± 6.3 1 CH,CCO -0.3 ± 1.8 1 C,H,O,CH,J,CHOOH)CH, 2.9 ± 6.3 1 CH,CCO -0.3 ± 1.8 1 C,H,O,D,CH,JOCH,OH -3.0 ± 5.4 1 CH,CCO -0.4 ± 2.3 1 C,H,O,D,CH,OHOH -3.0 ± 5.4 1 CH,CCO -10.3 ± 1.8 1 <td></td> <td>-70.3 ± 7.1</td> <td>1</td> <td>*C₂H₂O₂, 2-C(O)OH-*C₂H₄</td> <td>-33.0</td> <td>1</td>		-70.3 ± 7.1	1	*C ₂ H ₂ O ₂ , 2-C(O)OH-*C ₂ H ₄	-33.0	1
C,H,O,CH,CH,CH,JOCH, -42.3 ± 3.8 1 C,H,O,CH,J,COCH, -36.0 1 C,H,O,CH,J,COCH, -72.4 ± 10 1 CH,O,CH,J,COCH -36.0 1 C,H,O,CH,J,COCH, -72.4 ± 10 1 CH,O,CH,ONH 66.1 1 C,H,O,CH,J,COCH, -102.5 ± 8.4 1 CL,HO,CH,CHOOH 46.0 ± 4.6 1 CH,CO,CH,OCH,OHOOH -220.1 ± 8.4 1 CL,HO,CH,OHOOH 26.9 1 CH-C=O, ketenyl 177.5 ± 8.8 1 CJ,HO,CH,CHOOHICH, 2.9 ± 6.3 1 CH-CO 381.2 ± 2.1 1 CJ,HO,CH,OHOOHICH, 2.9 ± 6.3 1 CCO 381.2 ± 2.1 1 CJ,HO,CH,OHOOHICH, 2.9 ± 6.3 1 CH,CO -10.3 ± 1.8 1 CJ,HO,CH,OHOOHICH, 2.9 ± 6.3 1 CH,CO -0.13 ± 1.8 1 CJ,HO,CH,OHOOHICH, 2.9 ± 6.3 1 CH,CO -0.13 ± 1.8 1 CJ,HO,CH,CH,OOH -30.1 ± 5.4 1 CH,CICOO -17.6 ± 23 1 CH,NECHON		-81.2 ± 4.2	1	, , , , ,	-35.0	1
C ₁ H ₁ O ₁ (CH ₂) ₂ COCH ₃ -72.4±10 1 CH ₃ O ₂ CH ₂ OOH 66.1 1 C ₂ H ₁ O ₂ (HOL) ₂ COCH ₃ -102.5±8.4 1 C ₂ H ₂ O ₂ CH ₂ CH ₂ OOH 46.0±4.6 1 C ₂ H ₁ O ₂ (HOCH ₂ CHOH) -220.1±8.4 1 C ₂ H ₂ O ₂ CH ₂ CH ₂ OOH 26.9 1 CH-C=O, ketenyl 177.5±8.8 1 C ₂ H ₂ O ₂ CH ₂ CH ₂ OOH 10.9±5.4 1 HC(O) 42.5±0.5 1 C ₂ H ₂ O ₂ CH ₂ CH ₂ OOH -30.1±5.4 1 CCO 381.2±2.1 1 C ₂ H ₂ O ₂ CH ₂ CH ₂ OOH -30.1±5.4 1 CH ₂ C(O) -10.3±1.8 1 C ₂ H ₂ O ₂ CH ₂ COH ₂ OOH -30.1±5.4 1 CH ₂ C(O) -608.7 1 C ₂ H ₂ O ₂ CH ₂ COOH -30.1±5.4 1 CH ₂ C(O) -608.7 1 C ₂ H ₂ O ₂ CH ₂ C(OOOH -30.1±5.4 1 CH ₂ C(O) -608.7 1 C ₂ H ₂ O ₂ CH ₂ C(OOOH -30.1±5.4 1 CH ₂ C(O) -608.7 1 C ₂ H ₂ O ₂ CH ₂ C(OOOH -137.9 1 CH ₂ C(C(O) </td <td>· · · · · · · · · · · · · · · · · · ·</td> <td>-42.3 ± 3.8</td> <td>1</td> <td></td> <td>-36.0</td> <td>1</td>	· · · · · · · · · · · · · · · · · · ·	-42.3 ± 3.8	1		-36.0	1
C,H ₁ ,O, (CH ₃), COCH ₂ -102.5 ± 8.4 1 C,H ₁ O ₂ CH ₂ CH ₃ OOH 46.0 ± 4.6 1 C,H ₁ O ₂ HOCH ₂ CHOH -220.1 ± 8.4 1 C,H ₂ O ₂ CH ₂ CH ₃ OOH 26.9 1 CH=C=O, ketenyl 177.5 ± 8.8 1 C,H ₂ O ₂ CH ₂ CH ₂ CH ₂ OOH 10.9 ± 5.4 1 CCO 381.2 ± 2.1 1 C,H ₂ O ₂ CH ₂ CH ₂ OOOH -30.1 ± 5.4 1 CCO 381.2 ± 2.1 1 C,H ₂ O ₂ CH ₂ CH ₂ OOH -30.1 ± 5.4 1 CH ₃ C'(O) -10.3 ± 1.8 1 C,H ₃ O ₂ CH ₂ CH ₂ OOH -30.1 ± 5.4 1 CH ₃ C'(O) -60.87 1 C,H ₃ O ₂ CH ₃ CH ₂ OOH -26.8 ± 5.4 1 CH ₂ C(O) -60.87 1 C,H ₃ O ₂ CH ₃ CH ₂ OOH -26.8 ± 5.4 1 CH ₂ C(O) -21 ± 12.6 1 CH ₃ O ₂ CH ₃ CH ₂ OOH -26.8 ± 5.4 1 CH ₂ C(O) -21 ± 12.6 1 CH ₃ O ₂ CH ₃ CH ₂ OOH -26.8 ± 5.4 1 CH ₂ C(O) -10.7 1 CH ₃ O ₂ CH ₂ CH ₂ COOH -137.9 1	. ,		1		66.1	1
C,H,O,, HOCH,C'HOH -220.1±8.4 1 'C,H,O,, CH,CHOOH 26.9 1 C'H-C=O, ketenyl 177.5±8.8 1 'C,H,O,, CH,CHOOH 10.9±5.4 1 HC(O) 42.5±0.5 1 'C,H,O,, CH,CHOOHCH, 2.9±6.3 1 CCO 381.2±2.1 1 'C,H,O,, CH,JCCH,JOOH -30.1±5.4 1 CH,C'(O) -10.3±1.8 1 'C,H,O,, CH,JCCH,JOOH -30.1±5.4 1 CH,C'(O) -608.7 1 'C,H,O,, CH,JCCH,JOOH -26.8±5.4 1 CH,CIC(O) -608.7 1 'C,H,O,, CH,JCCH,JOOH -26.8±5.4 1 CH,CIC(O) -608.7 1 'C,H,O,, CH,JCCH,JOOH -137.9 1 CH,CIC(O) -17.6±2.3 1 'CH,N,O,, CH,CICH,JOOH -137.9 1 CH,CIC(O) -19.7 1 'CH,N,O,, CH,CICH,JOOH -137.9 1 CH,JC(O) -19.7 1 'CH,NET,HO,O 'CH,NH,D 111.7±8.4 1 CH,JC(O) -88.5 1 (CH,J)CH,CH		-102.5 ± 8.4	1		46.0 ± 4.6	1
$\begin{array}{c} \text{CH-C=O, ketenyl} & 177.5 \pm 8.8 & 1 \\ \text{HC'(O)} & 42.5 \pm 0.5 & 1 \\ \text{CCO} & 381.2 \pm 2.1 & 1 \\ \text{CH_C(O)} & 42.5 \pm 0.5 & 1 \\ \text{CH_C(O)} & 381.2 \pm 2.1 & 1 \\ \text{CH_C(O)} & -10.3 \pm 1.8 & 1 \\ \text{CH_C(O)} & -21 \pm 12.6 & 1 \\ \text{CH_C(O)} & -21 \pm 12.6 & 1 \\ \text{CH_C(O)} & -10.7 & 1 \\ \text{CH_C(O)} & -10.2 & 1 \\ $		-220.1 ± 8.4	1		26.9	1
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		177.5 ± 8.8	1		10.9 ± 5.4	1
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	HC*(O)		1		2.9 ± 6.3	1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	C*CO	381.2 ± 2.1	1		-30.1 ± 5.4	1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CH ₃ C*(O)	-10.3 ± 1.8	1		-26.8 ± 5.4	1
CH_CIC'(O)	CF ₃ C*(O)	-608.7	1		-137.9	1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CH,ClC*(O)	-21 ± 12.6	1		494.5	1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CHCl ₂ C•(O)	-17.6 ± 23	1	*CH ₂ N=CH ₂	263.6 ± 12.6	1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CCl ₃ C*(O)	-19.7	1	•CH ₂ NH ₂	151.9 ± 8.4	1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CH ₃ CH ₂ C•(O)	-31.7 ± 3.4	1	CH ₃ C*HNH ₂	111.7 ± 8.4	1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CH ₂ CHC*(O)	88.5	1	(CH ₃) ₂ C*NH ₂	69.9 ± 8.4	1
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	CH ₂ C(CH ₃)C*(O)	58.6 ± 16.7	1	*CH ₂ NHCH ₃	156.6	1
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	CH ₃ CH ₂ CH ₂ C*(O)	54.4 ± 4.2	1	*CH ₂ N(CH ₃) ₂	148.0	1
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	(CH ₃) ₂ CHC*(O)	-64.0 ± 3.8	1	(C ₂ H ₅) ₂ NC*HCH ₃	68.6 ± 2.1	1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		-102.9 ± 6.3	1		266.0 ± 12.6	1
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	C ₆ H ₅ C•(O)	116.3 ± 10.9	1	*CN	439.3 ± 2.9	1
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	HC(O)CH ₂ •	10.5 ± 9.2	1	•CH ₂ CN	252.6 ± 4	1
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ClC(O)CH ₂ •	-52.7 ± 13	1	CH ₃ C•HCN	226.7 ± 12.6	1
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	E-C*HClC(O)H	-27.2 ± 10.5	1	•CH ₂ CH ₂ CN	245.4 ± 12.6	1
E-C'HCIC(O)CI -88.7 ± 15.1 1 NCC'HCH ₂ CN 381.8 ± 12.6 1 C'H ₂ C(O)F -273.0 ± 5.8 1 'CH ₂ NC 334.7 ± 16.7 1 Z-C'HCIC(O)CI -84.9 ± 13.8 1 'C(O)NC 210.0 ± 10 1 C'Cl ₂ C(O)Cl -101.7 ± 15.5 1 'C(O)NH ₂ -15.1 ± 4 1 CH ₃ C(O)CH ₂ * -34 ± 3 1 C'NN 569 ± 21 1 CH ₃ C(O)C*HCH ₃ -70.3 ± 7.1 1 HC*NN 460 ± 8 1 CH ₃ C(O)C*=CH ₂ 113.4 1 H ₂ C*NN 292.5 ± 2.1 1	Z-C*HClC(O)H	-23.4 ± 10.5	1	(CH ₃) ₂ C*CN	190.4 ± 12.6	1
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	C*Cl ₂ C(O)H	-55.6 ± 14.2	1	Ph(CH ₃)C*CN	248.5 ± 8.4	1
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	E-C*HClC(O)Cl	-88.7 ± 15.1	1	NCC•HCH ₂ CN	381.8 ± 12.6	1
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	C*H ₂ C(O)F	-273.0 ± 5.8	1	•CH ₂ NC	334.7 ± 16.7	1
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Z-C*HClC(O)Cl	-84.9 ± 13.8	1	•C(O)NC	210.0 ± 10	1
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	C*Cl ₂ C(O)Cl	-101.7 ± 15.5	1	°C(O)NH ₂	-15.1 ± 4	1
$CH_3C(O)C^*=CH_2$ 113.4 1 H_2C^*NN 292.5 ± 2.1 1	CH ₃ C(O)CH ₂ •	-34 ± 3	1	C*NN	569 ± 21	1
3 \ ' 2	CH ₃ C(O)C*HCH ₃	-70.3 ± 7.1	1	HC*NN	460 ± 8	1
$C_2H_5C(O)C^*HCH_3$	$CH_3C(O)C^{\bullet}=CH_2$	113.4	1	H ₂ C*NN	292.5 ± 2.1	1
	$C_2H_5C(O)C^{\bullet}HCH_3$	-107.5 ± 20.9	1	*CH ₂ NO	157 ± 4	1

CH,NO,	Radical	Δ _t H° ₂₉₈ /kJ mol ⁻¹	Ref.	Radical	Δ _t H° ₂₉₈ /kJ mol ⁻¹	Ref.
CH_CHNO_ 619±126 1 PP_CSPh 435.6±126 1 CH_CHNO_ 63±126 1 NC(O) 125.2 1 CH_CHNO_ 1690±126 1 CNN 323.3 1 C_HN_ANH_CH_ 320.1 1 CNO 33±3.3 1 C_HNO_3-NO_CH_ 322.8 1 CH_SIMe_ -32±6 1 C_HNO_3-NO_CH_ 302.7 1 CH_SIME_ -32±6 1 C_HCH_CH_AMECH_ 296.6±96 1 CP_CHCH_CH_AMECH_ 296.6±96 1 HO* 109+10 1 C_HN_D, 2-Me+NO_CH_ 295.4±8.4 1 FO* 109+10 1 C_HN_D pyrrol-2+1 385.8 1 Bo* 126±17 1 C_HN_D pyrrol-3+1 385.8 1 Bo* 125±17 1 C_HN_D pyrrol-3+2 382.0 1 Bo* 125±17 1 C_HN_D pyrrol-3+3 382.6 1 Bo* 125±17 1 C_HN_D pyrrol-3-4	*CH,NO,	,		Ph ₂ C*SO ₂ Ph	,	
Decembor 1901 126 1		61.9 ± 12.6	1	Ph ₃ C*SPh	435.6 ± 12.6	1
Decembor 1901 126 1	(CH ₂) ₂ C*NO ₂	6.3 ± 12.6	1		127.2	1
C, H, M, a NH, C, H, 320.1 1 CNO 323.30 1 C, H, M, a NH, C, H, 327.8 1 CH, SiMe, -32.6 1 C, H, NO, a NO, C, H, 302.7 1 CP 450.29 1 C, H, CH, 2 - Me-C, H, 305.1 1 CP 450.29 1 C, H, NO, 2 - Me, C, H, 296.6 ± 9.6 1 1 PO 109.210 1 C, H, NO, 2 - S, NO, 2, CH, 305.4 1 FO 109.210 1 C, H, NO, 9 - S, NO, 2, CH, 305.4 1 FO 109.210 1 C, H, NO, 9 - S, NO, 2, CH, 305.8 1 CO 101.63.21 1 C, H, NO, 9 - S, NO, 2, CH, 385.8 1 CO 101.63.21 1 C, H, NO, 9 - S,		169.0 ± 12.6	1	*CNH	207.9 ± 12.1	1
C, H, N, a-NH, C, H, 340.6 ± 10.0 1 CH, SMGe, -32 ± 6 1 C, H, NO, a-NO, C, H, 340.6 ± 10.0 1 CH, C(H, SiMe) -125 1 C, H, C, H, a-No, C, H, 315.1 ± 10.5 1 CP 450 ± 9 1 C, H, C, H, a-Me, C, H, 296.6 ± 9.6 1 HO' 37.36 ± 0.13 1 C, H, N, Q, 2, Me+NO, C, H, 295.1 ± 8.4 1 CiO 101.6 ± 0.1 1 C, H, N, pyrrol-3 yl 385.8 1 BrO' 126.2 ± 1.7 1 C, H, N, pyrrol-3 yl 385.8 1 HOO' 123.0 ± 0.25 1 C, H, N, pyrrid-4-yl 391.0 1 FOO' 25.4 ± 2 1 C, H, N, pyrid-4-yl 391.0 1 GOO' 25.4 ± 2 1 C, H, N, pyrid-4-yl 391.0 1 GOO' 25.4 ± 2 1 C, H, N, pyrimid-2-yl 490.2 ± 12.6 1 IOO' 96.6 ± 15 1 C, H, N, pyrimid-4-yl 490.0 ± 12.6 1 OCIO' 95.6	2	320.1	1	*CNO	323 ± 30	1
C,H,NO, 3-NO, C,H, 30.6 ± 10.0 1 CH,C(CH),SIMe, -125 1 C,H,NO, 4-NO, C,H, 302.7 1 CP 450 ± 9 1 C,H,CH, 2-Me-C,H, 296.6 ± 9.6 1 CD,CH,4-Me-C,H, 296.6 ± 9.6 1 C,H,N,O,3,5-(NO),2-C,H, 305.4 1 FO 109 ± 10 1 C,H,N, pyrrol-2-yl 385.8 1 CO 101.63 ± 0.1 1 C,H,N, pyrrol-3-yl 385.8 1 IO° 115.9 ± 5.0 1 C,H,N, pyrroldin-2-yl 142.7 ± 12.6 1 HOO* 123.0 ± 0.5 1 C,H,N, pyrroldin-2-yl 391.0 1 ClOO* 98.0 ± 4 1 C,H,N, pyrroldin-2-yl 391.0 1 ClOO* 98.0 ± 4 1 C,H,N, pyrroldin-2-yl 391.0 1 ClOO* 98.0 ± 4 1 C,H,N, pyrroldin-2-yl 391.0 1 ClOO* 98.0 ± 4 1 C,H,N, pyrroldin-2-yl 391.0 1 ClOO* 98.0 ± 4 1		327.8	1	•CH ₂ SiMe ₂	-32 ± 6	1
C,H,NO, 4+NO, C,H, 30.7 1 CP, CH, CH, 2-Me-C,H, 315.1±10.5 1 C,H,CH, 2-Me-C,H, 315.1±10.5 1 (2) Oxygen-Centered Species C,H,NO, 3-KNO, C,H, 396.4 1 HO' 37.36±0.13 1 C,H,NO, 2-Me-4-NO, C,H, 295.4±8.4 1 ClO' 101.63±0.1 1 C,H,N, pyrrol-2-yl 385.8 1 IO' 126.2±1.7 1 C,H,N, pyrrol-2-yl 385.8 1 IO' 115.9±5.0 1 C,H,N, pyrrol-2-yl 362.0 1 HOO' 12.3±0.25 1 C,H,N, pyrrol-2-yl 391.0 1 ClOo' 38.4±2 1 C,H,N, pyrrad-2-yl 499.2±12.6 1 OFO' 37.8±2 1 C,H,N, pyrrad-2-yl			1			1
CH, CH, 2-Me C, H, 315.1±10.5 1 C, H, CH, 4-Me C, H, 296.5±6.6 1 C, H, CH, 4-Me C, H, 296.5±6.6 1 C, H, NO, 2-Me - 4-NO, C, H, 295.4±8.4 1 FO' 109.±10 1 C, H, NO, 2-Me - 4-NO, C, H, 295.4±8.4 1 CIO' 101.63±0.1 1 C, H, N, pyrrol-2-yl 385.8 1 BrO' 126.2±1.7 1 C, H, N, pyrrol-3-yl 385.8 1 HOO' 123.20.205.5 1 C, H, N, pyrid-3-yl 390.0 1 CIOO' 25.4±2 1 C, H, N, pyrid-3-yl 391.0 1 BrO' 108.2±0 1 C, H, N, pyrimid-4-yl 391.0 1 BrO' 108.2±0 1 C, H, N, pyrimid-2-yl 388.0±12.6 1 OFO' 378.6±2.0 1 C, H, N, pyrimid-4-yl 409.0±12.6 1 OFO' 378.6±2.0 1 C, H, N, pyrimid-5-yl 464.2±0.6 1 OFO' 378.6±2.0 1 C, H, N, p			1	2 32 3		1
C, H, CH, 4-Me C, H, 296.6 ± 9.6 1 HO 37.36 ± 0.13 1 C, H, MO, 2-Si (NO), 2, CH, 305.4 1 FO 109 ± 10 1 C, H, NO, 2-Si (NO), 2, CH, 295.4 ± 8.4 1 FO 109 ± 10 1 C, H, N, pyrol-2-yl 385.8 1 10° 115.9 ± 5.0 1 C, H, N, pyrol-2-yl 362.0 1 HOO* 12.30 ± 0.25 1 C, H, N, pyrid-2-yl 391.0 1 Cloo* 25.4 ± 2 1 C, H, N, pyrid-3-yl 391.0 1 Cloo* 98.0 ± 4 1 C, H, N, pyrid-4-yl 391.0 1 Cloo* 98.0 ± 4 1 C, H, N, pyrimid-2-yl 409.2 ± 12.6 1 OFO* 378.6 ± 20 1 C, H, N, pyrimid-4-yl 409.2 ± 12.6 1 OCIO* 95.4 1 C, H, N, pyrimid-4-yl 409.0 ± 12.6 1 ClOOGO* 142 ± 12 1 C, H, N, pyrimid-5-yl 446.4 ± 12.6 1 ClOOGO* 124 ± 12 1 <td>0 1 2 2 0 1</td> <td></td> <td></td> <td></td> <td></td> <td></td>	0 1 2 2 0 1					
CH,N,O, 2-St-(NO), 2-CH, 2-St-8.4 1 HO 373-62-0.13 1 CH,N,O, 2-Me-4-NO, CH, 2-St-8.4 1 FO 109 ± 10 1 CH,N, pyrrol-3-yl 385.8 1 BrO* 116.3 ± 0.1 1 CH,N, pyrrol-3-yl 385.8 1 IO 115.9 ± 5.0 1 CH,N, pyrrid-3-yl 362.0 1 FOO* 25.4 ± 2 1 CH,N, pyrid-4-yl 391.0 1 COO* 25.4 ± 2 1 CH,N, pyrid-4-yl 391.0 1 BrOO* 108.± 40 1 CH,N, pyrid-4-yl 391.0 1 BrOO* 108.± 40 1 CH,N, pyrimid-2-yl 409.2±12.6 1 OFO* 378.6±20 1 CH,N, pyrimid-2-yl 409.2±12.6 1 OFO* 378.6±20 1 CH,N, pyrimid-4-yl 409.0±12.6 1 OFO* 378.6±20 1 CH,N,NO,J 31.0 446.4±12.6 1 OCIO* 95.4 1 CH,N,NO,J 20.1 <				(2) Oxygen-Centered Species		
C, H, NO₂, 2-Mc 4+NO₂ C, H₃ 295.4 ± 8.4 1 FO 109.10 1 C, H, N, pyrrol-2-yl 385.8 1 BrO 126.2 ± 1.7 1 1 C, H, N, pyrrol-3-yl 385.8 1 BrO 126.2 ± 1.7 1 1 C, H, N, pyrid-3-yl 362.0 1 FOO 25.4 ± 2 1 <				HO*	37.36 ± 0.13	1
C,H,N, pyrrol-2-yl 385.8 1 CO 101.33±6.1 1 126.2±1.7 1 126.2±1.7 1 126.2±1.7 1 126.2±1.7 1 126.2±1.7 1 126.2±1.7 1 126.2±1.7 1 1 126.2±1.7 1 1 126.2±1.7 1 1 1 126.2±1.7 1 2 1 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 2 2 2 2 2 2 2				FO*	109 ± 10	1
C ₁ H ₁ N ₁ , pyrrol-3-yl 385.8 1 BrO' 126.2±1.7 1 C ₂ H ₁ N ₂ , pyrrolidin-2-yl 142.7±12.6 1 IO° 115.9±5.0 1 C ₂ H ₁ N ₂ , pyrrolid-3-yl 391.0 1 FOO' 25.4±2 1 C ₂ H ₁ N ₂ , pyrrolid-3-yl 391.0 1 BrOO' 108.±40 1 C ₄ H ₁ N ₂ , pyrrolid-4-yl 391.0 1 BrOO' 96.6±15 1 C ₄ H ₁ N ₂ , pyrrolid-4-yl 499.2±12.6 1 OFO' 378.6±20 1 C ₄ H ₁ N ₂ , pyrrolid-4-yl 499.2±12.6 1 OFO' 378.6±20 1 C ₄ H ₁ N ₂ , pyrrolid-5-yl 446.4±12.6 1 OCIO' 95.4 1 C ₄ H ₁ N ₂ , pyrimid-5-yl 446.4±12.6 1 CICIO' 90±30 1 CH(NO ₂) 139.1 1 NCO' 184.1 1 C(NO ₂) 201.2 1 NCO' 184.1 1 C(NO ₂) 103.3 1 HONO' 172.±1 1				ClO•	101.63 ± 0.1	1
Cyll, N. pyrid-2-yl 142.7 ± 12.6 1 IO 115.9 ± 5.0 1 Cyll, N. pyrid-2-yl 362.0 1 FOO' 25.4 ± 2 1 Cyll, N. pyrid-3-yl 391.0 1 FOO' 25.4 ± 2 1 Cyll, N. pyrid-4-yl 391.0 1 BrOO' 108 ± 40 1 Cyll, N. pyraid-2-yl 19.7 1 100' 96.6 ± 15 1 Cyll, N. pyraid-2-yl 49.9 ± 12.6 1 OFO' 378.6 ± 20 1 Cyll, N. pyraid-2-yl 489.2 ± 12.6 1 OCO' 96.6 ± 15 1 Cyll, N. pyraid-4-yl 499.2 ± 12.6 1 OCO' 378.6 ± 20 1 Cyll, N. pyraid-4-yl 499.2 ± 12.6 1 OCO' 378.6 ± 20 1 Cyll, N. pyraid-4-yl 499.2 ± 12.6 1 OCO' 378.6 ± 20 1 Cyll, N. pyraid-4-yl 499.2 ± 12.6 1 OCO' 378.6 ± 20 1 Cyll, N. pyraid-4-yl 409.2 ± 12.6 1 OCO' 386.6 1				BrO*	126.2 ± 1.7	1
C, H, N, pyrid-2-yl 362.0 1 HOO' 125.4±2 1 C,H, N, pyrid-3-yl 391.0 1 ClOO' 98.0±4 1 C,H, N, pyrid-4-yl 391.0 1 BrOO' 108±40 1 C,H,N, pyrad-2-yl 119.7 1 IOO' 96.6±15 1 C,H,N, pyrad-2-yl 399.2±12.6 1 OFO' 378.6±20 1 C,H,N, pyrimid-2-yl 409.2±12.6 1 OCO' 95.4 1 C,H,N, pyrimid-2-yl 409.0±12.6 1 OCO' 95.4 1 C,H,N, pyrimid-5-yl 46.4±12.6 1 CIOCIO' 142±12 1 CH,OO,J 139.1 1 NCO' 184.1 1 CH,CROO,J 150.6 1 HONNO' 172 1 CH,CROO,J 150.6 1 HONNO' 172 1 CH,CH(NO),J 103.3 1 sym-ClO; 217.2±2 1 CH,CH,CNO,J 173.6 1 HSO'				IO*	115.9 ± 5.0	1
C ₁ H ₁ N, pyrid-3-yl 391.0 1 FOO' 25.4±2 1 C ₂ H ₁ N, prid-4-yl 391.0 1 BrOO' 98.0±4 1 C ₂ H ₁ N, priperad-2-yl 119.7 1 100' 96.6±15 1 C ₂ H ₁ N ₂ , primid-2-yl 409.2±12.6 1 OFO' 378.6±20 1 C ₁ H ₁ N ₂ , pyrimid-2-yl 409.0±12.6 1 OCIO' 95.4 1 C ₁ H ₁ N ₂ , pyrimid-4-yl 409.0±12.6 1 COCO' 95.4 1 CH ₁ N ₂ , pyrimid-4-yl 409.0±12.6 1 COCO' 95.4 1 CH ₁ N ₂ , pyrimid-4-yl 409.0±12.6 1 COCO' 95.4 1 CH ₁ N ₁ N ₂ pyrimid-5-yl 446.4±12.6 1 CIOOCIO' 90±30 1 CH ₁ N ₁ N ₂ pyrimid-5-yl 446.4±12.6 1 CICIO' 90±30 1 CH ₂ N ₁ N ₂ pyrimid-5-yl 466.4 1 CICIO' 90±30 1 CH ₂ CH ₂ O ₁ O ₂ 150.6 1 NCO' 184.1 1				HOO*	12.30 ± 0.25	1
Cyfi, N, pyprid-4-yl 391.0 1 Cloo* 98.0±4 1 Cyfi, N, pyprid-4-yl 119.7 1 BrOO* 108±40 1 Cyfi, N, pyprid-4-yl 409.2±12.6 1 100° 96.6±15 1 Cyfi, N, pyrimid-2-yl 409.0±12.6 1 OCIO* 95.4 1 Cyfi, N, pyrimid-4-yl 409.0±12.6 1 CICIO* 90±30 1 CH(NO,) 139.1 1 NCO* 184.1 1 CH(NO,) 201.2 1 NCO* 184.1 1 CHO, CINO,) 150.6 1 HONNO* 172 1 CH, CIK(NO,) 150.6 1 HONNO* 172 1 CH, CIK(NO,) 153.3 1 sym*CIO 217.2±21 1 CH, CIK(NO,) 153.3 1 sym*CIO 217.2±21 1 CH, CH(NOO,) 173.6 1 HSO* 112 1 CH, CH(NOO,) 173.6 1 HSO* 121.8				FOO*	25.4 ± 2	1
C ₁ H,N ₂ , pipierad-2-yl 119.7 1 BrOo* 108 ± 40 1 C ₁ H,N ₂ , pyrimid-2-yl 409.2 ± 12.6 1 OFO 378.6 ± 20 1 C ₁ H,N ₂ , pyrimid-2-yl 388.0 ± 12.6 1 OFO 378.6 ± 20 1 C ₂ H,N ₂ , pyrimid-4-yl 409.0 ± 12.6 1 CIClO* 95.4 1 C ₂ H,N ₂ , pyrimid-5-yl 446.4 ± 12.6 1 CIClO* 90 ± 30 1 CHOO,0 139.1 1 NCO* 184.1 1 CHC,CNO,0,3 150.6 1 NCO* 386.6 1 CH,CHOO,0,3 150.6 1 NCO* 386.6 1 CH,CHONO,3 133.9 1 MNO* 172 1 CH,CH,CNOO,3 173.6 1 HSO* 212.2 1 CH,NOO,3CH,CHNO,3 168.6 1 CH,SOO* 76 1 CH,CH,NOO,3CH,CHONO,3 37.7 1 NCO* 184.0 1 CH,CH,NOO,3 -57.3 1 </td <td>3 4</td> <td></td> <td></td> <td>ClOO•</td> <td>98.0 ± 4</td> <td>1</td>	3 4			ClOO•	98.0 ± 4	1
C ₁ H ₁ N ₂ , pyriazin-2-yl 409.2±12.6 1 100° 96.6±15 1 C ₁ H ₁ N ₂ , pyrimid-2-yl 388.0±12.6 1 OFCO 378.6±20 1 C ₁ H ₁ N ₂ , pyrimid-2-yl 486.0±12.6 1 OCIO° 95.4 1 C ₁ H ₁ N ₂ , pyrimid-5-yl 446.4±12.6 1 CIClO° 90±30 1 C(NO) ₂ 139.1 1 NCO° 184.1 1 C(NO ₂) ₂ 201.2 1 CNO° 386.6 1 CH ₂ C(NO ₂) ₃ 150.6 1 CNO° 386.6 1 CH ₂ CH ₂ C(NO ₂) ₃ 133.3 1 HONNO° 172 1 CH ₂ CH ₂ C(NO ₂) ₃ 133.9 1 HSO° -21.8±2.1 1 CH ₂ CH ₂ CN(NO ₂) ₃ 173.6 1 HSO° -21.8±2.1 1 CH ₂ N(NO ₂ CH ₂ CH(NO ₂) ₃ 168.6 1 CH ₂ SOO° 76 1 CH ₂ CH ₂ N(NO ₂ CH ₂ C(NO ₂) ₃ 168.6 1 CH ₂ SOO° 73.7±1.4 1	<i>y</i> .			BrOO•	108 ± 40	1
C ₁ H,N _p pyrimid-2-yl 388.0 ± 12.6 1 OFO 378.6 ± 20 1 C ₁ H,N _p pyrimid-4-yl 409.0 ± 12.6 1 OCIO 95.4 1 C ₁ H,N _p pyrimid-5-yl 446.4 ± 12.6 1 CIOOCIO 142 ± 12 1 CCHNO ₂ / ₃ 139.1 1 NCO 184.1 1 CCNO ₃ / ₃ 150.6 1 CNO 386.6 1 CH ₂ C(NO ₂ / ₃ 150.6 1 CNO 386.6 1 CH ₂ C(NO ₂ / ₃ 150.6 1 CNO 386.6 1 CH ₂ C(RO ₂ / ₃ 150.6 1 CNO 386.6 1 CH ₂ C(RIO ₂ / ₃ 133.9 1 HSO 172 1 CH ₂ CH ₂ C(NO ₂ / ₃ 133.9 1 HSO 218.2.1 1 CH ₂ CH ₂ C(NO ₂ / ₃ 173.6 1 HSO 76 1 CH ₂ N(NO ₂)CH ₂ CH(NO ₂ / ₃ 173.6 1 CH ₂ SO,0 76 1 CH ₂ CH ₂ N(NO ₂ CH ₂ C(NO ₂) 37.7 <td>- · · -</td> <td></td> <td></td> <td>IOO•</td> <td>96.6 ± 15</td> <td>1</td>	- · · -			IOO•	96.6 ± 15	1
C ₁ H,N ₂ pyrimid-4-yl 409.0 ± 12.6 1 CClOCO 95.4 1 C ₄ H,N ₂ pyrimid-5-yl 446.4 ± 12.6 1 ClOCOCO 142 ± 12 1 CC(NO ₂) ₃ 139.1 1 CICICO 90 ± 30 1 CC(NO ₂) ₃ 201.2 1 NCO 184.1 1 CCH ₂ C(NO ₂) ₃ 150.6 1 HONNO 172 1 CH ₂ CH(NO ₂) ₂ 103.3 1 sym-ClO ₃ 217.2 ± 21 1 CH ₂ CH(CNO ₂) ₃ 133.9 1 HSO° 218.± 2.1 1 CH ₂ CH ₂ CH ₂ CNO ₂) ₃ 173.6 1 HSO° 218.± 2.1 1 CH ₂ CH ₂ CH ₂ CNO ₂) ₃ 168.6 1 CH ₃ SOO° 76 1 CH ₂ CH ₃ ONO ₂ CH ₂ C(NO ₂) ₃ 168.6 1 CH ₃ SOO° 76 1 CH ₂ CH ₃ ONO ₂ CH ₂ C(NO ₂) ₃ 158.2 1 NCO° 184.0 1 CH ₂ CH ₃ ONO ₂ CH ₂ C(NO ₂) ₃ 158.2 1 NCO° 184.0 1	1 0 2			OFO•	378.6 ± 20	1
CH, N ₂ pyrimid-5-yl 446.4 ± 12.6 1 CLOOGIO 142 ± 12 1 'CH(NO) ₂ 139.1 1 CLOOGIO 90 ± 30 1 'C(NO) ₃ 201.2 1 NCO' 184.1 1 'CH ₂ C(NO) ₃ 150.6 1 HONNO' 172 1 'CH ₂ C(NO) ₃ 103.3 1 Sym-ClO ₃ 217.2 ± 21 1 'CH ₂ CH ₂ C(NO) ₃ 133.9 1 HSOO' 217.2 ± 21 1 'CH ₂ CH ₂ C(NO) ₃ 133.9 1 HSOO' 112 1 'CH ₂ CH ₂ C(NO) ₃ 133.9 1 HSOO' 112 1 'CH ₂ CH ₂ C(NO) ₃ 168.6 1 CH ₃ SOO' 76 1 'CH ₂ CH ₂ N(NO ₃)CH ₂ C(NO ₃ 168.6 1 CH ₃ SOO' 76 1 'CH ₂ CH ₂ N(NO ₃)CH ₂ C(NO ₃ 168.6 1 CH ₃ SOO' 76 1 'CH ₂ C(NO ₃)CH ₂ C(NO ₃) -57.3 1 NCO' 184.0 1 'CH ₂ C(H ₂ NOO ₃) <t< td=""><td></td><td></td><td></td><td>OClO•</td><td>95.4</td><td>1</td></t<>				OClO•	95.4	1
CH(NO ₂) ₂ 139.1 1 CCRO 184.1 1 CCN(O ₂) ₃ 201.2 1 NCO° 184.1 1 CCN ₂ (CNO ₂) ₃ 150.6 1 NCO° 386.6 1 CH ₂ CH(NO ₂) ₂ 103.3 1 Sym-ClO ₃ 217.2±21 1 CH ₂ CH(NO ₂) ₃ 133.9 1 HSO° -21.8±2.1 1 CH ₂ CH ₂ C(NO ₂) ₃ 173.6 1 HSO° -21.8±2.1 1 CH ₂ N(NO ₂)CH ₂ C(NO ₂) ₃ 168.6 1 CH ₃ SOO° 76 1 CH ₂ CH ₂ N(NO ₂ CH ₂ C(NO ₂) ₃ 168.6 1 CH ₃ SOO° 76 1 CH ₂ CH ₂ N(NO ₂ CH ₂ C(NO ₂) ₃ 37.7 1 NCO° 184.0 1 CH ₂ CH ₂ N(NO ₂ C(NO ₂) ₃ -57.3 1 O ₂ NO° 73.7±1.4 1 CH ₂ CH ₂ N(NO ₂ ONO ₂ -57.3 1 O ₂ NO° 73.7±1.4 1 CH ₂ CH ₂ O(NO ₂ ONO ₂ -57.3 1 O ₂ NO° -511.7 1 CH ₂				Clooclo•	142 ± 12	1
C(NO ₂) 201.2 1 NCO 184.1 1 1 1 1 1 1 1 1 1				ClClO•	90 ± 30	1
CH,CNO ₂) ₃ 150.6 1 HONNO' 172 1 CH,CH(NO ₂) ₂ 103.3 1 Sym-ClO ₃ 217.2±21 1 CH,CH(NO ₂) ₃ 133.9 1 HSO' -21.8±2.1 1 CH,N(NO ₂)CH,C(NO ₂) ₃ 173.6 1 HSO' 1112 1 CH,N(NO ₂)CH,C(NO ₂) ₃ 168.6 1 CH ₃ SOO' 76 1 CH,CH ₂ ONO ₃ 37.7 1 CH ₃ CH ₂ ONO' 78.7±1.4 1 CH,CH ₂ ONO ₂ CHCH ₂ ONO ₂ -57.3 1 ONO' 73.7±1.4 1 CH,CH ₂ ONO ₂) ₃ -158.2 1 HOSO' 75.11.7 1 CH,CH ₂ ONO ₂ 164.8 1 CH ₃ OO' 75.11.7 1 CH ₂ N(NO ₃)CH ₃ 149.4 1 CH ₃ OO' 75.11.7 1 CH ₂ N(NO ₂)CH ₃ 144.3 1 CH ₃ OO' 75.11.7 1 CH ₂ CH ₂ N(NO ₂) ₃ 210.5 1 CF ₃ O' -635.1±7.1 1 CH ₂ N(NO ₂) ₂ 210.5 1 CF ₃ O' -38.1±9.2 1 CH ₂ N(NO ₂) ₂ 173.2 1 CH ₂ ClO' -32.2±9.2 1 CH ₃ N(NO ₂)CH ₃ N(NO ₂)CH ₃ 136.8±5.9 1 CH ₃ CH ₂ O' -13.6±3.3 1 CH ₃ SOO' 75.1 1 CH ₃ CH ₂ OO' 75.1 1 CH ₃ ClO'				NCO•	184.1	1
CH_CHNO ₀) ₂ 103.3 1	2 0			CNO•	386.6	1
CH,CH,C(NO ₂) ₃ 133.9 1 sym-ClO ₃ 217.2±21 1 CH,NNO ₂ CH ₂ C(NO ₂) ₃ 173.6 1 HSO° -21.8±2.1 1 CH,NNO ₂ CH ₂ C(NO ₂) ₃ 168.6 1 CH ₃ SOO° 76 1 CH ₂ CH ₂ N(NO ₂)CH ₂ C(NO ₂) ₃ 168.6 1 CH ₃ SOO° -912 1 CH ₂ CH ₂ ONO ₂ CHCH ₂ ONO ₂ 37.7 1 NCO° 184.0 1 CH ₂ (CH ₂ ONO ₂) ₃ -57.3 1 O ₂ NO° 73.7±1.4 1 CH ₂ (CH ₂ ONO ₂) ₃ -158.2 1 O ₂ NO° 73.7±1.4 1 CH ₂ (CH ₂ ONO ₂) ₃ -158.2 1 ONOO° 82.8 1 CH ₂ (CH ₂ ONO ₂) ₃ -164.8 1 CH ₂ O° 21.0±2.1 1 CH ₂ (CH ₂ ONO ₂) ₃ 164.8 1 CH ₃ O° 21.0±2.1 1 CH ₂ (NO) ₂ CH ₃ 149.4 1 CH ₃ O° 21.0±2.1 1 CH ₂ (NNO ₂ CH ₃ 144.3 1 CH ₃ O° -635.1±7.1 1				HONNO•	172	1
CH,NINO ₃)CH ₂ C(NO ₂) ₃ 173.6 1 HSO' -21.8 ± 2.1 1 CH,NINO ₃)CH ₂ C(N(NO ₂) ₃ 126.4 1 HSOO' 112 1 CH,NINO ₃)CH ₂ C(NO ₂) ₃ 168.6 1 CH ₃ SOO' 76 1 CH,CH ₂ NNO ₂ 37.7 1 NCO' 184.0 1 CH ₂ (CH ₂ ONO ₂) ₂ -55.5 1 NCO' 184.0 1 CH(CH ₂ ONO ₂) ₂ -57.3 1 NCO' 184.0 1 CH(CH ₂ ONO ₂) ₂ -57.3 1 NCO' 184.0 1 CH(CH ₂ ONO ₂) ₂ -57.3 1 NCO' 184.0 1 CH(CH ₂ ONO ₂) ₂ -57.3 1 ONOO' 82.8 1 CH ₂ (CH ₂ ONO ₂) ₂ 164.8 1 CH ₂ O' -511.7 1 CH ₂ N(NO ₂)CH ₃ 149.4 1 CH ₃ O' -635.1±7.1 1 CH ₂ N(NO ₂)CH ₃ 144.3 1 CH ₂ O' -38.1±9.2 1 CH ₂ N(NO ₂)CH ₃ <t< td=""><td></td><td></td><td></td><td>sym-ClO₂</td><td>217.2 ± 21</td><td>1</td></t<>				sym-ClO ₂	217.2 ± 21	1
CH ₁ N(NO ₂)CH ₂ CH(NO ₂) ₂ 126.4 1 HSOO' 112 1 CH ₂ N(NO ₂)CH ₂ C(NO ₂) ₃ 168.6 1 CH ₂ SOO' 76 1 CH ₂ CH ₂ ONO ₂ 37.7 1 CH ₃ SOO' -912 1 CH ₂ (CH ₂ ONO ₂) ₂ -25.5 1 NCO' 184.0 1 CH ₂ (CH ₂ ONO ₂) ₂ -57.3 1 O ₂ NO' 73.7±1.4 1 CH ₂ (CH ₂ ONO ₂) ₂ -57.3 1 O ₂ NO' 73.7±1.4 1 CH ₂ (CH ₂ ONO ₂) ₂ -58.2 1 HOS(O) ₂ O' 73.7±1.4 1 CH ₂ (CH ₂ ONO ₂) ₃ -158.2 1 HOS(O) ₂ O' 751.7 1 CH ₂ (CH ₂ ONO ₂) ₃ 144.8 1 CH ₂ O' 21.0±2.1 1 CH ₂ N(NO ₂)CH ₃ 144.3 1 CH ₂ O' -635.1±7.1 1 CH ₂ N(NO ₂)CH ₃ 144.3 1 CH ₂ ClO' -38.1±9.2 1 CH ₂ N(NO ₂)CH ₃ 173.2 1 CH ₂ ClO' -21.3±9.2 1 <tr< td=""><td>2 2 2 3</td><td></td><td></td><td>HSO*</td><td>-21.8 ± 2.1</td><td>1</td></tr<>	2 2 2 3			HSO*	-21.8 ± 2.1	1
CH2CH,N(NO2)CH2C(NO2)3 168.6 1 CH3SOO* 76 1 *CH2CH2ONO2 37.7 1 CF3SO2O* -912 1 *CH2CH2ONO2)CHCH2ONO2 -25.5 1 NCO* 184.0 1 *CH2CH2ONO2)2 -57.3 1 ONOO* 82.8 1 *CH2CH2ONO2)3 -158.2 1 ONOO* 82.8 1 *CH2CH2NNO2 164.8 1 CH3O* -511.7 1 *CH2NNO2CH3 149.4 1 CH3O* 21.0±2.1 1 *CH2NNO2CH3 149.4 1 CF3O* -635.1±7.1 1 *CH2NNO2CH3 144.3 1 CH3O* -38.1±9.2 1 *CH2NNO2CH3 144.3 1 CH2CIO* -21.3±9.2 1 *CH2NNO2CH3NNO2CH3 202.1 1 CH2CIO* -32.2±9.2 1 *CH3NNO2/CH3NNO2/CH3 173.2 1 CHCIQO* -32.2±9.2 1 *CH3SCH3 300.4±8.4 1 CF3CHFO*				HSOO*	112	1
CH_CH_N(NO_2)CH_2C(NO_2)_3 168.6 1				CH ₃ SOO*	76	1
CH,CH,ONO ₂ 37.7 1 NCO' 184.0 1 'CH,(CH ₂ ONO ₂) ₂ -25.5 1 O ₂ NO' 73.7 ± 1.4 1 'CH ₂ C(CH ₂ ONO ₂) ₃ -158.2 1 ONOO' 82.8 1 'CH ₂ C(CH ₂ ONO ₂) ₃ -158.2 1 HOS(O) ₂ O' -511.7 1 'CH,NINO ₂ 164.8 1 CH ₃ O' 21.0 ± 2.1 1 'CH,NINO ₂ 210.5 1 CF ₃ O' -635.1 ± 7.1 1 'CH ₂ CH ₂ N(NO ₂) ₂ CH ₃ 144.3 1 CCI ₃ O' -38.1 ± 9.2 1 'CH ₂ (NNO ₂)CH ₃ 124.3 1 CH ₂ CIO' -21.3 ± 9.2 1 'CH ₂ N(NO ₂)CH ₃ 173.2 1 CHC ₂ O' -32.2 ± 9.2 1 'CH ₂ N(NO ₂)CH ₂ N(NO ₂)CH ₃ 173.2 1 CHC ₂ O' -32.2 ± 9.2 1 'CH ₂ N(NO ₂)(CH ₂)N(NO ₂)CH ₃ 173.2 1 CHC ₂ O' -32.2 ± 9.2 1 'CH ₃ SH 300.4 ± 8.4 1 CF ₃ CHFO' -851.0 1 'CH ₃ SCH ₃ 136.8 ± 5.9 1 CH ₃ CCI ₂ O' -13.6 ± 3.3 1 'CH ₃ SCH ₃ 136.8 ± 5.9 1 CH ₃ CCIO' -13.6 ± 3.3 1 'CH ₃ SOCH ₃ 23.8 ± 12.6 1 CH ₃ CCI ₂ O' -91.6 ± 11.7 1 'CH ₃ SOCH ₃ 10.5 1 CG ₃ H ₂ O' -30.1 ± 8.4 1 'CH ₃ SOCH ₃ 110.5 1 CG ₃ H ₂ O' -30.1 ± 8.4 1 'CH ₃ SO ₂ CH ₃ -177.0 ± 12.6 1 CG ₃ CIO' -108.4 ± 8.4 1 'CH ₃ SO ₂ CH ₃ -177.0 ± 12.6 1 CG ₄ C ₄ CO' -62.8 1 PhC'HSO ₂ CH ₃ -109.2 ± 12.6 1 CG ₄ C ₄ O' -62.8 1 PhC'HSO ₂ CH ₃ -109.2 ± 12.6 1 CG ₄ CO' -60.5 1					-912	1
CH ₂ (ONO ₂)CHCH ₂ ONO ₂ -25.5 1 CH ₂ (C(H ₂ ONO ₂) ₂ -57.3 1 CH ₂ (C(H ₂ ONO ₂) ₃ -158.2 1 CH ₂ N(NO ₂)CH ₃ 149.4 1 CH ₂ N(NO ₂)CH ₃ 149.4 1 CH ₂ N(NO ₂)C ₃ 210.5 1 CH ₂ N(NO ₂)CH ₃ 144.3 1 CH ₂ N(NO ₂)CH ₃ 120.5 1 CH ₂ N(NO ₂)CH ₃ 120.1 1 CH ₂ N(NO ₂)CH ₃ 173.2 1 CH ₂ N(NO ₂)CH ₃ N(NO ₂)CH ₃ 173.2 1 CH ₂ N(NO ₂)(CH ₂)N(NO ₂)CH ₃ 173.2 1 CH ₂ N(NO ₂)(CH ₂)N(NO ₂)CH ₃ 173.2 1 CH ₂ SH 151.9 ± 8.4 1 CH ₃ SH 151.9 ± 8.4 1 CH ₃ SCH ₃ 136.8 ± 5.9 1 CH ₃ CCL ₂ O [*] -13.6 ± 3.3 1 CH ₃ SCH ₃ 136.8 ± 5.9 1	2 2 2					1
CH(CH ₂ ONO ₂) ₂ -57.3 1 ONOO' 82.8 1 'CH ₂ C(CH ₂ ONO ₂) ₃ -158.2 1 HOS(O) ₂ O' -511.7 1 'CH ₂ N(NO ₂)CH ₃ 149.4 1 CH ₃ O' 21.0 ± 2.1 1 'CH ₂ N(NO ₂)CH ₃ 144.3 1 CC ₃ O' -635.1 ± 7.1 1 'CH ₂ N(NO ₂)CH ₃ 120.5 1 CC ₃ O' -38.1 ± 9.2 1 'CH ₂ N(NO ₂)CH ₃ 202.1 1 CH ₂ CIO' -21.3 ± 9.2 1 'CH ₂ N(NO ₂)CH ₃ N(NO ₂)CH ₃ 173.2 1 CH ₂ O(O' -32.2 ± 9.2 1 'CH ₂ N(NO ₂)(CH ₂)N(NO ₂)CH ₃ 173.2 1 CH ₂ O' -32.2 ± 9.2 1 'CH ₂ SH 300.4 ± 8.4 1 CF ₃ CHFO' -851.0 1 'CH ₂ SCH ₃ 136.8 ± 5.9 1 CF ₃ O' -13.6 ± 3.3 1 'CH ₂ SCH ₃ 136.8 ± 5.9 1 CH ₃ CHCIO' -61.9 ± 12.1 1 'CH ₂ SOCH ₃ 23.8 ± 12.6 1 CH ₃ CCI ₂ O' -91.6 ± 11.7 1 'CH ₂ SOC ₃ -177.0 ± 12.6 1 CH ₃ CCIO' -108.4 ± 8.4 1 'CH ₃ SO ₂ CH ₃ -109.2 ± 12.6 1 CH ₃ COCIO' -60.5 1 PhC'HSO ₂ CH ₃ -109.2 ± 12.6 1 CH ₃ CO' -60.5 1				O,NO*	73.7 ± 1.4	1
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CY(S)H 300.4 ± 8.4 1 CF ₃ CHFO* -851.0 1 *CH ₂ SH 151.9 ± 8.4 1 CF ₃ CHFO* -851.0 1 *CH ₂ SCH ₃ 136.8 ± 5.9 1 C ₂ H ₅ O* -13.6 ± 3.3 1 *CH ₂ SPh 268.6 ± 12.6 1 CH ₃ CHCIO* -61.9 ± 12.1 1 *CH ₂ SOCH ₃ 23.8 ± 12.6 1 CH ₃ CCI ₂ O* -91.6 ± 11.7 1 *CH ₂ SO ₂ CH ₃ 110.5 1 iC ₃ H ₇ O* -30.1 ± 8.4 1 *CH ₂ SO ₂ CH ₃ -177.0 ± 12.6 1 (CH ₃) ₂ CCIO* -108.4 ± 8.4 1 *CH ₂ SO ₂ Ph -57.3 ± 12.6 1 (CH ₃) ₂ CCIO* -108.4 ± 8.4 1 PhC*HSO ₂ CH ₃ -109.2 ± 12.6 1 -62.8 1 PhC*HSO Ph 7 ± 12.6 1 -69.5 1	*CH ₂ N(NO ₂)(CH ₂)N(NO ₂)CH ₃	173.2	1	-		
CH2SH 151.9 ± 8.4 1 $C_2H_5O^$ -13.6 ± 3.3 1 *CH2SCH3 136.8 ± 5.9 1 $C_2H_5O^*$ -61.9 ± 12.1 1 *CH2SPh 268.6 ± 12.6 1 $CH_3CCI_2O^*$ -91.6 ± 11.7 1 *CH2SOCH3 110.5 1 110.5 1 10.5	C*(S)H	300.4 ± 8.4	1	_		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	•CH ₂ SH	151.9 ± 8.4	1			
CH2SPh 268.6 \pm 12.6 1 CH3CCI2O -91.6 \pm 11.7 1 *CH2SOCH3 23.8 \pm 12.6 1 nC3H2O* -91.6 \pm 11.7 1 *CH2SO2CH3 -177.0 \pm 12.6 1 iC3H2O* -48.5 \pm 3.3 1 *CH2SO2Ph -57.3 \pm 12.6 1 (CH3)2CCIO* -108.4 \pm 8.4 1 PhC*HSO2CH3 -109.2 \pm 12.6 1 nC4H9O* -62.8 1 PhC*HSO.Ph 7 \pm 12.6 1 sC4H9O* -69.5 1	•CH ₂ SCH ₃	136.8 ± 5.9	1			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	•CH ₂ SPh	268.6 ± 12.6	1			
HOC (S)S 110.5 1 $iC_3H_7O^{\bullet}$ -48.5 ± 3.3 1 *CH ₂ SO ₂ CH ₃ -177.0 ± 12.6 1 $iC_3H_7O^{\bullet}$ -48.5 ± 3.3 1 *CH ₂ SO ₂ Ph -57.3 ± 12.6 1 $(CH_3)_2CClO^{\bullet}$ -108.4 ± 8.4 1 PhC*HSO ₂ CH ₃ -109.2 ± 12.6 1 $nC_4H_9O^{\bullet}$ -62.8 1 PhC*HSO ₂ Ph 7 ± 12.6 1 $sC_4H_9O^{\bullet}$ -69.5 1	*CH ₂ SOCH ₃	23.8 ± 12.6	1			
*CH ₂ SO ₂ CH ₃ -177.0 ± 12.6 1 *CH ₂ SO ₂ Ph -57.3 ± 12.6 1 PhC*HSO ₂ CH ₃ -109.2 ± 12.6 1 PhC*HSO ₂ Ph 7 ± 12.6 1 PhC*HSO ₂ Ph 7 ± 12.6 1	HOC*(S)S	110.5	1	* '		
$^{\bullet}\text{CH}_2\text{SO}_2\text{Ph}$ -57.3 ± 12.6 1 $\text{nC}_4\text{H}_9\text{O}^{\bullet}$ -62.8 1 $\text{PhC}^{\bullet}\text{HSO}_2\text{CH}_3$ -109.2 ± 12.6 1 $\text{sC}_4\text{H}_9\text{O}^{\bullet}$ -69.5 1 $\text{PhC}^{\bullet}\text{HSO}_2\text{Ph}$ 7 ± 12.6 1		-177.0 ± 12.6	1			
PhC'HSO ₂ CH ₃ -109.2 ± 12.6 1 sC_4 H ₉ O* -69.5 1		-57.3 ± 12.6	1	5 2		
PhC*HSO.Ph 7 ± 12.6 1 * * *	PhC*HSO ₂ CH ₃	-109.2 ± 12.6	1	. ,		
-65.8 ± 3.8	PhC*HSO ₂ Ph	7 ± 12.6	1	• 1		
				1041190	- 03.0 ± 3.0	1

Radical	Δ_{f} H $^{o}_{298}$ /kJ mol $^{-1}$	Ref.	Radical	$\Delta_{f} H^{o}_{298}/kJ \text{ mol}^{-}$	1 Ref.
$\mathrm{CH_2}\mathrm{=}\mathrm{CHCH_2O^\bullet}$	87.0	1	*NNH	249.5	1
C ₆ H ₅ O•	48.5 ± 2.9	1	*NCO	131.8	1
o-Cl-C ₆ H ₄ O•	30.6	1	*N ₃	414.2 ± 20.9	1
C ₆ Cl ₅ O•	~63	1	*N ₂ H ₃	243.5	1
p-Cl-C ₆ H ₄ O•	~9	1	(Z)-N ₂ H ₂	213.0 ± 10.9	1
o-OH-C ₆ H ₄ O*	-186.3	1	NF	209.2	1
p-OH-C ₆ H ₄ O*	-143.6	1	*NF ₂	42.3 ± 8	1
o-CH ₃ O-C ₆ H ₄ O*	-125.5	1	*NHF	112 ± 15	1
p-CH ₃ O-C ₆ H ₄ O*	-81.1	1	NBr	301 ± 21	1
C ₆ H ₅ CH ₂ O [•]	136.0 ± 12.6	1	HNO	107.1 ± 2.5	1
C ₁₀ H ₇ O*, naphthoxy-1	165.3	1	FNO	-65.7 ± 1.7	1
C ₁₀ H ₂ O*, naphthoxy-2	174.1	1	CINO	51.71 ± 0.42	1
HC(O)O*	-129.7 ± 12.6	1	BrNO	82.13 ± 0.8	1
FC(O)O*	368.0	1	INO	112.1 ± 20.9	1
CH ₃ C(O)O*	-179.9 ± 12.6	1	NCO	120.9	1
CF ₃ C(O)O*	-797.0	1	NCN	464.8 ± 2.9	1
CF ₃ OC(O)O*	-958.1 ± 16.7	1	NSi	372 ± 63	1
$C_6H_5C(O)O^{\bullet}$	-50.2 ± 16.7	1	NH,C(O)N*H	0.8 ± 12.6	1
CH ₃ OO*	20.1 ± 5.1	1	CH ₃ C(O)N*H	-6.7 ± 12.6	1
C ₂ H ₂ OO*, CH ₂ =CHOO*	101.7 ± 1.7	1	NH ₂ C(S)N*H	194 ± 12.6	1
C ₂ H ₅ OO•	-28.5 ± 9.6	1	CH ₂ C(S)N*H	173 ± 12.6	1
C ₃ H ₅ OO*, CH ₂ =CHCH ₂ OO*	88.7	1	PhC(S)N*H	307 ± 12.6	1
iC ₃ H ₂ OO•	-65.4 ± 11.3	1	HCON*H	49.8 ± 12.6	1
C ₄ H ₇ OO*, CH ₃ CH=CHCH ₂ OO*	82.6 ± 5.3	1	NH ₂ C(NH)N*H	250.6 ± 12.6	1
$tC_4H_9OO^{\bullet}$	-101.5 ± 9.2	1	*NHCN	319.2 ± 2.9	1
	-101.5 ± 3.2 -115.5	1		104.6 ± 12.6	1
neo-C ₅ H ₁₁ OO•	-113.3 -162.1	1	CH ₂ N*H		1
HOCH ₂ OO•	100	1	CH ₃ N*H tBuN*H	184.1 ± 8.4	1
HOOCH ₂ CH ₂ OO*		1		95.4 ± 12.6	1
C ₆ H ₅ CH ₂ OO*	114.6 ± 4.2		C ₆ H ₅ CH ₂ N*H	288.3 ± 12.6	
c-C ₆ H ₁₁ OO•	-25.0 ± 10.5	1	C ₆ H ₅ N*H	244.3 ± 4.2	1
(C ₂ H ₅)N(CH3)CHOO*	-36.0 ± 12.6	1	(CH ₃) ₂ N•	158.2 ± 4.2	1
CF ₃ OO*	-635.0	1	$(C_6H_5)(CH_3)N^4$	241.0 ± 6.3	1
CF ₂ ClOO*	-406.7 ± 14.6	1	(C ₆ H ₅) ₂ N*	366.0 ± 6.3	1
CFCl ₂ OO*	-213.7	1	1-pyrrolyl	269.2 ± 12.6	1
CH ₂ ClOO*	-5.1 ± 13.6	1	1-pyrazolyl	413.0 ± 2.1	1
CHCl ₂ OO*	-19.2 ± 11.2	1	carbazol-9-yl	383.3 ± 8.4	1
CCl ₃ OO•	-20.9 ± 8.9	1	CH ₃ N ₂ •	215.5 ± 7.5	1
CH ₃ CHClOO*	-54.7 ± 3.4	1	$C_2H_5N_2^{\bullet}$	187.4 ± 10.5	1
CH ₃ CCl ₂ OO*	-63.8 ± 9.8	1	iC ₃ H ₇ N ₂ *	146.0 ± 8.4	1
CH ₃ OCH ₂ OO•	-142.2 ± 4.2	1	$nC_4H_9N_2^{\bullet}$	140.6 ± 8.4	1
CH ₃ C(O)CH ₂ OO•	-142.1 ± 4	1	$tC_4H_9N_2^{\bullet}$	97.5 ± 4.2	1
CH ₃ C(O)OO•	-154.4 ± 5.8	1	(NO ₂)HN*	162.3	1
H000°	>12.84	4	(CH ₃)(NO ₂)N*	139.0	1
CH ₃ OOO•	33.4 ± 12.6	1	(NO ₂) ₂ N•	200.0	1
C ₂ H ₅ OOO•	5.4 ± 12.6	1	CH ₃ N*CH ₂ N(NO ₂)CH ₃	185.4	1
(3) Nitrogen-Centered Species			(4) Sulfur-Centered Species		
ON	91.04 ± 0.08	1	HOS*	-6.7 ± 2.1	1
NO_2	33.97 ± 0.08	1	HC(O)S•	56.5	1
N_2O	82.05 ± 0.4	1	HS*O ₂	-221.8	1
NH	357 ± 1	1	HOS•O ₂	-384.9	1
'NH ₂	186.2 ± 1.0	1	NCS*	300 ± 8	1

Radical	ΔH° ₂₉₈ /kJ mol ⁻¹	Ref.	Radical	$\Delta_{\rm f}$ H $^{\circ}_{298}$ /kJ mol $^{-1}$	Ref.
HS*	143.0 ± 0.8	1	H ₃ SiSi*H ₃	234 ± 6	1
CH ₃ S*	124.7 ± 1.7	1	C ₆ H ₅ Si*H ₂	274	1
C ₂ H ₅ S*	101	1	H ₃ SiSi*H	312 ± 8	1
nC ₃ H ₇ S•	80	1	MeSi*	302.2	1
iC ₃ H ₇ S•	74.9 ± 8.4	1	MeSi*H	202 ± 6	1
tC ₄ H _o S•	43.9 ± 8.4	1	Me ₂ Si••	135 ± 8	1
C ₆ H ₅ S*	242.7 ± 4.6	1	SiN	313.8 ± 42	1
C ₆ Cl ₅ S*	~184	1	•GeH ₃	221.8 ± 8.4	1
C ₆ H ₅ CH ₂ S*	246	1	GeF	-71 ± 10	1
CH ₃ S*O	-67 ± 10	1	GeF ₂	-574 ± 20	1
CH ₃ S*O ₂	-239.3	1	•GeF ₃	-807 ± 50	1
HSS*	115.5 ± 14.6	1	GeCl	69 ± 18	1
CH ₃ SS*	68.6 ± 8.4	1	GeCl ₂	-171 ± 5	1
$C_2H_5SS^{\bullet}$	43.5 ± 8.4	1	•GeCl ₃	-268 ± 50	1
iC ₃ H ₇ SS•	13.8 ± 8.4	1	GeBr	137 ± 5	1
tC ₄ H ₉ SS•	-19.2 ± 8.4	1	GeBr ₂	-61 ± 5	1
HOC(S)S*	110.5 ± 4.6	1	•GeBr ₃	-119 ± 50	1
HC(O)S*	56.5	1	GeI	211 ± 25	1
SF	13.0 ± 6.3	1	GeI ₂	50.2 ± 4	1
SF_2	-296.7 ± 16.7	1	•GeI ₃	42 ± 50	1
SF_3	-503.0 ± 33.5	1	SnF	-95 ± 7.2	1
SF_4	-763.2 ± 20.9	1	SnF ₂	-511 ± 9.2	1
SF ₅	-879.9 ± 15.1	1	*SnF ₃	-647 ± 50	1
CIS*	156.5 ± 16.7	1	SnCl	35 ± 12	1
SN	263.6 ± 105	1	SnCl ₂	-202.6 ± 7.1	1
SCI	156.5 ± 16.7	1	•SnCl ₃	-292 ± 50	1
(5) Si-, Ge-, Sn-, Pb-Centered Specie	s		SnBr	76 ± 12	1
SiF	-20.1 ± 12.6	1	SnBr_2	-119 ± 2.8	1
SiF ₂	-638 ± 6	1	*SnBr ₃	-159 ± 50	1
*SiF ₃	-987 ± 20	1	SnI	173 ± 12	1
SiCl	198.3 ± 6.7	1	SnI ₂	-8.1 ± 4.2	1
SiCl,	-169 ± 3	1	•SnI ₃	-8 ± 50	1
*SiCl ₃	321 ± 8	6	*Sn(CH ₃) ₃	132.2	1
SiBr	235 ± 46	1	${}^{\bullet}\mathrm{Sn}(\mathrm{C_6H_5})_3$	518.8 ± 21	1
SiBr,	46 ± 8	1	PbH	236.2 ± 19.2	1
*SiBr ₃	-201.7 ± 63	1	PbF	-80.3 ± 10.5	1
SiI	313.8 ± 42	1	PbF ₂	-435.1 ± 8.4	1
SiI_{2}	92.5 ± 8.4	1	•PbF ₃	-490 ± 60	1
•SiI ₃	35.3 ± 63	1	PbCl	15.1 ± 50	1
SiH	376.6 ± 8.4	1	PbCl ₂	-174.1 ± 1.3	1
$SiH_2(^1A_1)$	273 ± 2	1	•PbCl ₃	-178 ± 80	1
$SiH_2(^3B_1)$	360.7	1	PbBr	70.9 ± 42	1
•SiH ₃	200.4 ± 2.5	1	PbBr ₂	-104.4 ± 6.3	1
MeSi*H ₂	141 ± 6	1	*PbBr ₃	-104 ± 80	1
Me ₂ Si•H	78 ± 6	1	PbI	107.4 ± 37.7	1
Me ₃ Si*	15 ± 7	1	PbI ₂	-3.2 ± 4.2	1
*Si ₂ H ₃	~402	1	•PbI ₃	22 ± 80	1

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TABLE 5. Bond Dissociation Energies of Some Organic Molecules

 $D^{o}_{_{298}}(R-X)/\ kJ\ mol^{-1}$ of some organic compounds are listed below. All data are from Tables 1 and 3.

	X=H	F	Cl	Br	I	OH	OCH_3	NH_2	NO	CH_3	COCH ₃	CF_3	CCl_3
R=H	435.7799	569.658	431.361	366.16	298.26	497.10	440.2	450.08	199.5	439.3	374.0	445.2	392.5
CH_3	439.3	460.2	350.2	294.1	238.9	384.93	351.9	356.1	172.0	377.4	351.9	429.3	362.3
C_2H_5	420.5	447.4	352.3	292.9	233.5	391.2	355.2	352.3	171.5	370.3	347.3	_	_
$i-C_3H_7$	410.5	483.8	354.0	299.2	234.7	397.9	360.7	357.7	152.7	369.0	340.2	_	_
$t-C_4H_9$	400.4	495.8	351.9	292.9	227.2	398.3	353.1	355.6	167	363.6	329.3	_	_
C_6H_5	472.2	525.5	399.6	336.4	272.0	463.6	418.8	429.3	226.8	426.8	406.7	463.2	388.7
$C_6H_5CH_2$	375.5	412.8	299.9	239.3	187.8	334.1	_	306.7	123	325.1	299.7	365.7	_
CCl ₃	392.5	439.3	296.6	231.4	168	_	_	_	125	362.3	_	332.2	285.8
CF ₃	445.2	546.8	365.3	296.2	227.2	≤482.0	_	_	167	429.3	_	413.0	332.2
C_2F_5	429.7	532.2	346.0	283.3	219.2	_	_	_	_	_	_	424.3	_
CH ₃ CO	374.0	511.7	354.0	292.0	223.0	459.4	424.3	414.6	_	351.9	307.1	_	_
CN	528.5	482.8	422.6	364.8	320.1	_	_	_	204.4	521.7	_	469.0	_
C_6F_5	487.4	485	383.3	~328	<301.7	446.9	_	_	211.3	439.3	_	435.1	_

TABLE 6. Bond Dissociation Energies in Diatomic Cations

From thermochemistry, we have

$$D^{o}_{298}({\rm A}^{+}-{\rm B}) \equiv \Delta_{r}H^{o}({\rm A}^{+}) + \Delta_{r}H^{o}({\rm B}) - \Delta_{r}H^{o}({\rm AB}^{+}) = D^{o}_{298}({\rm A}-{\rm B}) + IP({\rm A}) - IP({\rm AB})$$

Thus, $D_{298}^{o}(A^{+}-B)$ may be derived using the Table 1 and the ionization potentials of species A and AB. The following Table has been arranged in an alphabetical order of the atoms. The **boldface** in the species indicates the dissociated fragment.

$A^+ - B$	D_{298}^{o} kJ/mol ⁻¹	Ref.	A+-B	$D^o_{298}\mathrm{kJ/mol^{-1}}$	Ref.	A+-B	$D^{o}_{298}\mathrm{kJ/mol^{-1}}$	Ref.
$\mathbf{A}\mathbf{g}^{\scriptscriptstyle{+}}$ – Ag	167.9 ± 8.7	1	Au ⁺−Be	401 ± 29	1	Be+-Ar	49.0 ± 2.4	1
$\mathbf{A}\mathbf{g}^{\scriptscriptstyle{+}}\mathrm{-Cl}$	32 ± 30	1	Au+-C	311.5 ± 7.7	4	Be+-Au	410 ± 29	1
$\mathbf{A}\mathbf{g}^{\scriptscriptstyle{+}}\!-\!F$	24 ± 27	1	Au+-F	79	1	Be⁺-Be	196 ± 0.5	8
$\mathbf{A}\mathbf{g}^{\scriptscriptstyle{+}}\mathbf{-H}$	43.5 ± 5.9	1	Au ⁺–Ge	292 ± 24	1	Be⁺-Cl	417 ± 50	1
Ag^+-O	123 ± 5	1	Au+-H	213.1 ± 7.7	4	Be +−F	575 ± 98	1
\mathbf{Ag}^{+} $ \mathbf{S}$	123 ± 13	1	Au+-I	230~280	1	Be ⁺−H	307.3 ± 5.0	1
\mathbf{Al}^+ -Al	121	1	Au ⁺−Xe	130 ± 13	1	Be+-O	362.0 ± 6.2	1
\mathbf{Al}^+ -Ar	15.47	1	B⁺-Ar	32.7	1	Bi ⁺−Bi	199 ± 10	1
Al ⁺−Ca	148.5	1	B ⁺−B	187	1	Bi ⁺ -O	174	1
\mathbf{Al}^+ -Cl	173 ± 42	1	B ⁺−Br	164 ± 21	1	Bi ⁺ -S	179 ± 50	1
Al^+-F	314 ± 21	1	B +-C	284 ± 58	1	Bi ⁺–Se	184 ± 29	1
\mathbf{Al}^+ –Kr	5.54	1	B⁺-Cl	308 ± 21	1	Bi ⁺−Te	125 ± 50	1
Al^+-O	166.7 ± 12.0	1	B ⁺−F	460 ± 10	1	Bi+-Tl	100 ± 42	1
Al+-Se	114 ± 49	1	B ⁺−H	198 ± 5	1	Bk +-O	610	1
\mathbf{Ar}^{+} $ \mathbf{Ar}$	130.323 ± 0.087	1	B +-O	326 ± 48	1	Br ⁺−Br	318.858 ± 0.024	1
$\mathbf{Ar}^{\scriptscriptstyle +}\mathrm{-He}$	2.9 ± 0.8	1	B ⁺−Pt	314 ± 98	1	Br+-C	451.5 ± 8.6	1
\mathbf{Ar}^{+} -Ne	7.5 ± 0.8	1	B ⁺−Se	298 ± 98	1	Br+-Cl	303.000 ± 0.048	1
$\mathbf{A}\mathbf{s}^{\scriptscriptstyle{+}}\mathbf{-}\mathbf{A}\mathbf{s}$	364 ± 22	1	B ⁺−Si	365 ± 15	1	Br+-F	251.5 ± 12.6	1
As^+-H	290.8 ± 3.0	1	Ba ⁺–Ar	11.85	1	Br+-H	379.26 ± 2.89	1
As^+-O	495	1	Ba ⁺–Br	418 ± 10	1	Br+-O	365.7 ± 3.1	1
$\mathbf{A}\mathbf{s}^{\scriptscriptstyle{+}}\mathbf{-}\mathbf{P}$	367 ± 59	1	Ba ⁺–Cl	468.2 ± 10	1	C+-Ar	72.3	1
As^+-S	433.2 ± 12.5	1	Ba ⁺–D	245.2 ± 9.6	1	C⁺−Br	398 ± 8.6	1
$\mathbf{A}\mathbf{u}^{\scriptscriptstyle +}\mathbf{-}\mathbf{A}\mathbf{l}$	170 ± 30	1	Ba+−F	640 ± 29	1	C +-C	601.9 ± 19.3	1
$\mathbf{A}\mathbf{u}^{+}$ $-$ Au	234.5	1	Ba⁺-I	335 ± 10	1	C+-Cl	614	1
$\mathbf{A}\mathbf{u}^{\scriptscriptstyle{+}}\mathbf{-}\mathbf{B}$	329 ± 50	1	Ba⁺-O	441.4 ± 15	1	C +−F	721 ± 40	1

	Do 11/ 1-1	D. C	l	Do 17/ 1-1	D. C.	1	Do 11/ 1-1	D (
A+-B	$D_{298}^{o} \text{ kJ/mol}^{-1}$	Ref.	A+-B	$D^{o}_{298} \mathrm{kJ/mol^{-1}}$	Ref.	A+-B	290	Ref.
C+-H	397.848 ± 0.013	1	Co+−I	211.7 ± 8.4	1	Er+-Br	315.8	1
C+-N	524.5 ± 4.2	1	Co+-Kr	68.37 ± 0.18	1	Er+-Cl	406.7	1
C+-O	810.7 ± 0.8	1	Co+-Ne	12.8 ± 0.4	1	Er+-F	546 ± 34	1
C+-P	587 ± 50	1	Co+-O	317.3 ± 4.8	1	Er+-I	271.6	1
C+-S	706.6 ± 2.1	1	Co+-S	288.3 ± 8.7	1	Er+-O	583 ± 15	1
C⁺-Se	587 ± 50	1	Co⁺-Si	317.1 ± 6.7	1	Es+-O	470 ± 60	1
Ca+-Al	144.7	1	Co⁺–Xe	85.7 ± 6.8	1	Eu+-Ag		1
Ca+-Ar	12.99 ± 0.60	1	Cr+-Ar	31.7 ± 3.9	1	Eu+-Au		1
Ca+−Au	306 ± 29	1	Cr+-C	277 ± 24	1	Eu+-Br		1
Ca+−Br	417.6 ± 10	1	Cr+-Cl	>211	1	Eu+-Cl		1
Ca+−Ca	104.1	1	Cr+-Cr	129	1	Eu+-F	543 ± 29	1
Ca+-Cl	433.4 ± 12	1	Cr+-D	135 ± 9	1	Eu+-I	290.7	1
Ca+-F	556.5 ± 8.4	1	Cr+-F	279 ± 42	1	Eu+-O	393 ± 15	1
Ca+-H	284.2 ± 10	1	Cr+-H	136 ± 9	1	Eu+-S	257 ± 32	1
Ca+−I	293.7 ± 10.8	1	Cr ⁺–He	7.8 ± 0.4	1	F+-Ar	161.1	1
Ca ⁺−Kr	18.60 ± 0.72	1	Cr ⁺−Ne	9.5 ± 0.4	1	F+-F	325.393 ± 0.096	1
Ca ⁺−Ne	4.95 ± 0.06	1	Cr ⁺ -O	359	1	F ⁺−He	181.62 ± 0.08	1
Ca^+-O	348 ± 5	1	Cr+-S	258.6 ± 16.4	1	F +-Kr	152.4	1
Ca ⁺−Xe	25.38 ± 0.96	1	Cr⁺–Si	203 ± 15	1	F+-Xe	188	1
Cd +−Cd	122.5 ± 10	1	Cr ⁺−Xe	71.9 ± 10.0	1	Fe ⁺-Ar	14.2 ± 7.7	1
Cd^+-H	179.5	1	Cs ⁺−Ar	8.2	1	Fe⁺-Br	>293	1
$\mathbf{Ce}^{\scriptscriptstyle +}$ -Au	278 ± 34	1	Cs⁺−Br	60.5 ± 10	1	Fe ⁺ -C	356.1 ± 17.2	1
$\mathbf{Ce}^{\scriptscriptstyle +}\mathrm{-Br}$	341.0	1	Cs ⁺−Cl	107.4 ± 10	1	Fe ⁺ -Cl	>343	1
Ce^+-C	254 ± 96	1	Cs ⁺−Cs	62.6 ± 9.6	1	Fe+-Co	259 ± 21	1
$\mathbf{Ce}^{\scriptscriptstyle +}\mathrm{-Ce}$	207 ± 42	1	Cs ⁺ -F	43.7 ± 10	1	Fe ⁺ -Cr	209 ± 29	1
$\mathbf{Ce}^{\scriptscriptstyle +}\mathrm{-Cl}$	429.5	1	Cs ⁺−He	5.1	1	Fe+-Cu	222 ± 29	1
Ce^+-F	586 ± 63	1	Cs+-I	29.3 ± 10	1	Fe ⁺ -D	227	1
Ce^+-I	295.5	1	Cs ⁺−Kr	15.1	1	Fe ⁺ −F	360 - 423	1
Ce^{+} -Ir	530 ± 96	1	Cs ⁺−Na	48.1 ± 4.2	1	Fe ⁺−Fe	272	1
Ce^+-N	494 ± 63	1	Cs ⁺−Ne	6.11	1	Fe+-H	211.2 ± 9.6	1
Ce^+-O	852 ± 15	1	Cs+-O	59	1	Fe+-I	>239	1
Ce^+-Pd	255 ± 53	1	Cs ⁺−Rb	68.3 ± 10	1	Fe ⁺−Kr	33.5 ± 6.7	1
Ce^+-Pt	467 ± 96	1	Cs ⁺−Xe	14.7	1	Fe+-N	485	1
Ce^+ -Rh	423 ± 96	1	Cu ⁺–Ar	51.9 ± 6.8	1	Fe+-Nb	285 ± 21	1
Ce^+-S	524 ± 59	1	Cu ⁺–Cl	91 ± 10	1	Fe ⁺-Ni	268 ± 21	1
\mathbf{Cl}^{+} -Ar	169	1	Cu ⁺−Cu	155.2 ± 7.7	1	Fe+-O	334 ± 6	9
Cl+ $-Cl$	385.746 ± 0.096	6	Cu⁺−F	117 ± 21	1	Fe+-S	295.2 ± 5.8	1
Cl^+-D	457.284 ± 0.017	1	Cu ⁺–Ge	231 ± 23	1	Fe ⁺ −Sc	200 ± 21	1
Cl^+-F	291 ± 10	1	Cu ⁺−H	93 ± 13	1	Fe ⁺-Si	277 ± 9	1
Cl^+-H	452.714 ± 0.018	1	Cu ⁺−Kr	24.3 ± 0.8	1	Fe⁺-Ta	301 ± 21	1
Cl^+-N	650 ± 10	1	Cu ⁺ -O	133.9 ± 11.6	1	Fe⁺-Ti	251 ± 25	1
Cl⁺-O	468.0 ± 2.1	1	Cu⁺−S	203.3 ± 14.5	1	Fe ⁺ -V	314 ± 21	1
Cm^+-O	670 ± 40	7	Cu ⁺−Si	260 ± 8	1	Fe ⁺ -Xe	46.0 ± 5.8	1
Co ⁺–Ar	52.89 ± 0.06	1	Cu ⁺−Xe	102.1 ± 5.8	1	Ga ⁺–Bi	62 ± 98	1
Co⁺-Br	>289	1	\mathbf{D}^+ -D	263.4405 ± 0.0003	1	Ga ⁺–Br	56.5 ± 16	1
\mathbf{Co}^{+} $ \mathbf{C}$	351 ± 29	1	Dy ⁺−Br	324.2	1	Ga+-Cl	86 ± 21	1
Co+-Cl	285 ± 12	1	Dy ⁺−Cl	407.9	1	Ga+-F	136 ± 15	1
Co+-Co	269	1	Dy ⁺−Cu	196 ± 42	1	Ga+-Ga		1
\mathbf{Co}^+ $ \mathbf{D}$	199.6 ± 5.8	1	Dy ⁺−F	535 ± 24	1	Ga+-I	41.6 ± 15	1
Co⁺−H	195 ± 6	1	Dy +−I	279.9	1	Ga+-O	46 ± 50	1
Co ⁺–He	16.4 ± 0.4	1	Dy +-O	597 ± 15	1	Ga+-Sb		1
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A+ -B	$D^o_{298}\mathrm{kJ/mol^{-1}}$	Ref.	A+-B	$D^o_{298}\mathrm{kJ/mol^{-1}}$	Ref.	A+-B	$D^o_{298}\mathrm{kJ/mol^{-1}}$	Ref.
Ga ⁺–Te	19 ± 29	1	$\mathbf{Ir}^+ - \mathbf{D}$	302.8 ± 5.8	1	Lu+-I	40.7	1
Gd +−Cd	122.5 ± 10	1	Ir+-H	305.7 ± 5.8	1	Lu+-O	524 ± 15	1
Gd ⁺–H	179.5	1	Ir+-O	247	1	Lu ⁺−Si	107 ± 13	1
Ge^+ -Br	398 ± 42	1	K ⁺−Ar	14 ± 7	1	Mg ⁺ -Ar	19.20	1
Ge^+-C	223 ± 31	1	K⁺−Br	35.7 ± 10.5	1	Mg ⁺−Au	267 ± 29	1
Ge^+ -Cl	473 ± 50	1	K+-Cl	51 ± 19	1	Mg ⁺ -Cl	327 ± 6.5	1
Ge^+-F	565 ± 21	1	K⁺−He	6.00	1	Mg^+-D	203.6 ± 0.8	1
Ge ⁺–Ge	274 ± 10	1	K+-I	18 ± 45	1	Mg^+-F	477 ± 50	1
Ge^+-H	377 ± 84	1	K +-K	83.86 ± 0.15	1	Mg^+-H	190.8 ± 5.8	1
Ge+-O	344 ± 21	1	K +-Kr	15.8	1	Mg+-Kr	25.39	1
Ge^+-S	283 ± 21	1	K ⁺−Li	59.9 ± 5.9	1	Mg ⁺ -Mg	125	1
Ge ⁺–Se	234 ± 10	1	K ⁺−Na	58.69 ± 0.08	1	Mg+-Ne	4.9 ± 0.6	1
Ge ⁺-Si	268 ± 21	1	K+-Ne	7.79	1	Mg ⁺ -O	245.2 ± 10	1
Ge ⁺–Te	233 ± 19	1	K +-O	13	1	Mg⁺−Xe	53.74	1
$\mathbf{H}^+ - \mathbf{D}$	261.1021 ± 0.0002	1	K ⁺−Xe	19.5	1	Mn+-Cl	>211	1
$\mathbf{H}^+ - \mathbf{H}$	259.4659 ± 0.0002	1	Kr ⁺-Ar	55.31 ± 0.14	1	Mn+-F	321 ± 24	1
He^+-H	123.9	1	Kr⁺-H	464	1	Mn⁺-H	202.5 ± 5.9	1
He ⁺ –He	229.687 ± 0.019	1	Kr ⁺–He	2.1 ± 0.8	1	Mn⁺-I	>211	1
$Hf^{+}-C$	311.5 ± 2.9	10	Kr ⁺–Kr	110.967 ± 0.033	1	Mn ⁺-Mn	129	1
$\mathbf{H}\mathbf{f}^{+}-\mathbf{H}$	193.8 ± 10.6	2	Kr+-N	136.9 ± 13	1	Mn ⁺ -O	285 ± 13	1
Hf +-O	670.4 ± 10.6	10	Kr ⁺–Ne	3.8 ± 0.8	1	Mn⁺-S	247 ± 23	1
Hg ⁺–Ar	22.2 ± 1.2	1	La ⁺–Au	436 ± 97	1	Mn ⁺–Se	165 ± 50	1
Hg⁺-H	207	1	La⁺–Br	425.9	1	Mo+-C	442.7 ± 13.5	1
Hg ⁺−Hg	134	1	La+-C	427 ± 33	1	Mo ⁺−F	376 ± 29	1
Hg ⁺−Kr	37.9 ± 1.3	1	La⁺–Cl	503.6	1	Mo+-H	170 ± 6	1
Hg ⁺−Xe	72.2 ± 1.3	1	La⁺−F	589 ± 34	1	Mo+-Mo	449.4 ± 1.0	1
Ho⁺-Ag	155 ± 61	1	La+-H	243 ± 9	1	Mo ⁺ -O	488.2 ± 1.9	1
Ho ⁺–Au	250 ± 60	1	La⁺−I	392.4	1	Mo ⁺ -S	355.1 ± 5.8	1
Ho ⁺−Br	320.6	1	La+-Ir	356 ± 97	1	Mo ⁺−Xe	>53.1 ± 6.8	1
Ho+-Cl	410.3	1	La+-O	875 ± 25	1	N+-Ar	208.4 ± 9.6	1
Ho ⁺–Cu	214 ± 35	1	La+−Pt	522 ± 78	1	N+-F	584 ± 42	1
Ho +-F	542 ± 50	1	La +−Rh	345 ± 97	1	N+-H	≥435.67 ± 0.77	1
Ho +-Ho	88 ± 96	1	La+-S	629 ± 96	1	N +-N	843.85 ± 0.10	1
Ho+-I	270.4	1	La +−Si	277.0 ± 9.6	1	N+-O	115	1
Ho+-O	551 ± 25	1	Li+-Ar	33 ± 14	1	Na+-Ar	19 ± 8	1
I+-Br	184.90 ± 0.02	1	Li ⁺−Bi	91 ± 50	1	Na+-Br	58.2 ± 10.6	1
I+-Cl	247.5 ± 0.4	1	Li⁺-Br	41.8 ± 10.6	1	Na+-Cl	20.3 ± 10	1
I+-F	262.9 ± 2.1	1	Li ⁺−Cl	66 ± 15	1	Na+-He	7.55	1
I+-H	304.70 ± 0.10	1	Li+-F	7 ± 21	1	Na+-I	64.9 ± 3.0	1
I+-I	262.90 ± 0.04	1	Li ⁺–He	10.66	1	Na+-Kr	~24.9	1
I+-O	316.3 ± 10.5	1	Li⁺−I	51.1 ± 6.3	1	Na+-Li	95.8 ± 3.9	1
In ⁺–Br	65.2 ± 12.6	1	Li ⁺–Kr	48.1	1	Na+-Na	98.64 ± 0.29	1
In+-Cl	193 ± 21	1	Li ⁺–Li	137.3 ± 6.3	1	Na+-Na	6.4	1
In+-F	148 ± 50	1	Li ⁺–Ne	15.32	1	Na+-Ne	~9.04	1
In+-I	51.5 ± 21	1	Li+-O	38.9 ± 9.6	1	Na+-O	37 ± 19	1
In+-In	81 ± 30	1	Li+-Sb	129.6 ± 13.9	1	Na+-Xe	~28.6	1
In+-S	171 ± 50	1	Li+-Xe	56.4	1	Nb ⁺-Ar	40.87 ± 0.13	1
In+-Sb	73 ± 50	1	Lu+-Br	86.1	1	Nb⁺-C	509 ± 15	1
In+-Se	118 ± 50	1	Lu+-Cl	180.6	1	Nb ⁺ −Fe	>251	1
In⁺–Te	41 ± 50	1	Lu+-F	376.8	1	Nb +−H	220 ± 7	1
Ir+-C	635.8 ± 4.8	3	Lu+-H	204 ± 15	1	Nb ⁺-Nb	576.8 ± 9.6	1
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$A^+ - B$	$D^{o}_{298}\mathrm{kJ/mol^{-1}}$	Ref.	A+-B	$D^o_{298}\mathrm{kJ/mol^{-1}}$	Ref.	A+-B	$D^o_{298}\mathrm{kJ/mol^{-1}}$	Ref.
Nb^+-O	688 ± 11	1	$\mathbf{P}\mathbf{b}^{\scriptscriptstyle{+}}\mathrm{-Se}$	169.4 ± 6.3	1	S^+ -O	524.3 ± 0.4	1
Nb^+-S	501.7 ± 20.3	1	$\mathbf{P}\mathbf{b}^{\scriptscriptstyle +}\mathrm{-Te}$	163 ± 63	1	S^+-P	573 ± 21	1
Nb^+-V	404.7 ± 0.2	1	Pd^+-C	528 ± 5	1	S^+-S	522.4 ± 0.5	1
$\mathbf{N}\mathbf{b}^{\scriptscriptstyle +}\mathrm{-Xe}$	73.28 ± 0.12	1	Pd^+-H	208.4 ± 8.7	1	\mathbf{Sc}^{+} -C	326 ± 6	1
Nd^+ -Au	267 ± 84	1	Pd^+-O	145 ± 11	1	$\mathbf{Sc}^{\scriptscriptstyle +}\mathrm{-Cl}$	410 ± 42	1
Nd^+ -Br	352.9	1	\mathbf{Pd}^+ -Pd	197 ± 29	1	$\mathbf{Sc}^{+}\mathbf{-F}$	605 ± 32	1
Nd ⁺–Cl	441.4	1	Pd^+-S	197 ± 6	1	Sc ⁺−Fe	201 ± 21	1
Nd^+-F	309.6	1	Pd^+ -Si	289 ± 50	1	$\mathbf{Sc}^{\scriptscriptstyle +}\mathbf{-H}$	235 ± 8	1
Nd^+-I	596 ± 32	1	Pr ⁺-Au	317 ± 81	1	$\mathbf{Sc}^{\scriptscriptstyle +}\mathbf{-}\mathrm{O}$	689 ± 5	1
Nd^+-O	753 ± 15	1	\mathbf{Pr}^+ -Br	357.7	1	\mathbf{Sc}^{+} $ \mathbf{S}$	529.7 ± 17.4	1
Ne^+-H	1239	1	$\mathbf{Pr}^{\scriptscriptstyle +}\mathbf{-}\mathbf{Cl}$	445.0	1	Sc ⁺−Se	475.8 ± 8.4	1
Ne^+-He	13.0 ± 0.8	1	$\mathbf{Pr}^+ - \mathbf{F}$	557 ± 63	1	\mathbf{Sc}^{+} -Si	242.3 ± 10.5	1
Ne^+ -Ne	125.29 ± 1.93	1	$\mathbf{Pr}^{+}\mathbf{-I}$	317.0	1	$\mathbf{Se}^{+}\mathbf{-F}$	364 ± 42	1
Ni+-Ar	53.9	1	$Pr^{+}-O$	796 ± 15	1	Se^+-H	304	1
Ni^+ -Br	>289	1	$\mathbf{P}\mathbf{t}^{+}\mathbf{-A}\mathbf{r}$	36.4 ± 8.7	1	Se^+-P	514 ± 25	1
Ni^+-C	418	1	Pt^+-B	398 ± 105	1	Se^+-S	392 ± 19	1
Ni+-Cl	192 ± 4	1	$Pt^{+}-C$	530.5 ± 4.8	1	Se ⁺–Se	413 ± 19	1
Ni^+-D	166.0 ± 7.7	1	Pt+-Cl	249.8 ± 14.5	1	Si⁺-Au	175 ± 50	1
Ni^+-F	≥456	1	Pt^+-H	275 ± 5	1	Si^+-B	351 ± 15	1
Ni+-H	158.1 ± 7.7	1	Pt^+-N	326.9 ± 9.6	1	Si^+ -Br	276 ± 96	1
Ni⁺–He	12.4 ± 0.4	1	Pt ⁺ -O	318.4 ± 6.7	1	Si ⁺ -C	365 ± 50	1
Ni+-I	>297	1	Pt ⁺−Pt	318 ± 23	1	Si ⁺ -Cl	591.0 ± 0.6	1
Ni ⁺ -Ne	9.9 ± 0.4	1	Pt+-Si	515 ± 50	1	Si^+-F	684.1 ± 5.4	1
Ni+-Ni	208	1	Pt ⁺−Xe	86.6 ± 28.9	1	Si ⁺ -H	316.6 ± 2.1	1
Ni ⁺ -O	275.9 ± 7.7	1	Pu^+-F	562 ± 50	1	Si ⁺ -O	478 ± 13.4	1
Ni^+-S	241.0 ± 3.9	1	Pu^+-O	655	1	Si^+-P	272 ± 50	1
Ni+-Si	326 ± 6.7	1	$\mathbf{R}\mathbf{b}^{\scriptscriptstyle +}\!-\!\mathrm{Ar}$	12.0	1	Si+-Pd	237 ± 50	1
Np^+-F	730 ± 100	1	$\mathbf{R}\mathbf{b}^{\scriptscriptstyle{+}}\mathrm{-Br}$	17.6v5.1	1	Si ⁺ -Pt	525 ± 50	1
Np+-O	≥752	1	Rb ⁺−Cl	10.5 ± 10.5	1	Si+-S	387.5 ± 6.0	1
O+-Ar	33.8	1	$\mathbf{R}\mathbf{b}^{\scriptscriptstyle +}\mathbf{-}\mathbf{I}$	27 ± 42	1	Si ⁺-Si	334 ± 19	1
O+-F	301.8 ± 8.4	1	$\mathbf{R}\mathbf{b}^{\scriptscriptstyle +}\mathrm{-Kr}$	14.9	1	Si ⁺ -Te	347 ± 50	1
O+-H	487.9 ± 0.34	1	Rb ⁺−Na	50.1 ± 3.9	1	$\mathbf{Sm}^{\scriptscriptstyle +}\mathrm{-Br}$	343.3	1
O+-N	1050.64 ± 0.13	1	Rb ⁺−Ne	6.95	1	Sm+-Cl	435.4	1
O+-O	647.75 ± 0.17	1	Rb^+-O	29	1	$\mathbf{Sm}^+ - \mathbf{F}$	620.9	1
Os^+-H	238.9	1	\mathbf{Rb}^{+} -Rb	75.6 ± 9.6	1	Sm^+-I	299.1	1
Os^+-O	418 ± 50	1	$\mathbf{R}\mathbf{b}^{\scriptscriptstyle{+}}\mathrm{-Xe}$	21.5	1	Sm^+-O	569 ± 15	1
P^+-C	512 ± 42	1	Re^+-C	497.7 ± 3.9	1	$\mathbf{Sn}^{\scriptscriptstyle +}\mathrm{-Br}$	335 ± 50	1
\mathbf{P}^+ –Cl	289	1	Re^+-H	224.7 ± 6.7	1	Sn ⁺−Cu	184 ± 96	1
P^+-F	490.6 ± 8.4	1	Re^+-O	435 ± 59	1	\mathbf{Sn}^+ -F	364 ± 29	1
P +-H	329.6 ± 2.1	1	$\mathbf{R}\mathbf{h}^{+}$ $-\mathbf{C}$	414 ± 17	1	$\mathbf{Sn}^{\scriptscriptstyle +}\mathbf{-}\mathbf{O}$	281 ± 10	1
P^+-N	483 ± 21	1	$\mathbf{R}\mathbf{h}^{\scriptscriptstyle +}\mathbf{-}\mathbf{H}$	164.8 ± 3.8	1	\mathbf{Sn}^+ – \mathbf{S}	240 ± 19	1
P +-O	791.3 ± 8.4	1	Rh+-O	295.0 ± 5.8	1	Sn ⁺−Se	174 ± 6.3	1
\mathbf{P}^+ $-\mathbf{P}$	481 ± 50	1	Rh^+-S	226 ± 13	1	\mathbf{Sn}^+ – \mathbf{Sn}	193	1
P^+ –S	606 ± 34	1	Ru^+-C	453.5 ± 10.6	1	Sn⁺-Te	168.7 ± 8.4	1
Pa+-O	~800	1	Ru ⁺−H	160.2 ± 5.0	1	\mathbf{Sr}^{+} -Ar	13.32 ± 2.92	1
$\mathbf{P}\mathbf{b}^{\scriptscriptstyle +}\mathrm{-Br}$	260 ± 63	1	Ru⁺-O	372 ± 5	1	\mathbf{Sr}^+ –Br	378.1 ± 8.4	1
Pb ⁺−Cl	285 ± 63	1	Ru^+-S	288 ± 6	1	Sr+-Cl	427 ± 8.4	1
Pb ⁺ −F	347 ± 32	1	S +-C	620.8 ± 1.3	1	$\mathbf{Sr}^+ - \mathbf{F}$	615 ± 50	1
$Pb^{+}-O$	247 ± 8.4	1	S^+-F	343.5 ± 4.8	1	\mathbf{Sr}^+ -H	209 ± 5	1
Pb ⁺−Pb	214 ± 29	1	S +-H	348.2 ± 1.7	1	Sr+-I	308.2	1
Pb ⁺−S	293 ± 50	1	S +-N	516 ± 34	1	Sr+-Kr	18.13 ± 6.94	1
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A^+-B	$D^{o}_{298}\mathrm{kJ/mol^{-1}}$	Ref.	A+-B	$D^o_{298}\mathrm{kJ/mol^{-1}}$	Ref.	A+-B	$D^{o}_{298}\mathrm{kJ/mol^{-1}}$	Ref.
Sr+-Ne	4.52 ± 9.6	1	Tl ⁺−I	133 ± 21	1	Xe+-H	355	1
Sr^+-O	298.7	1	Tl ⁺–Tl	22 ± 50	1	Xe⁺−Kr	41.65 ± 0.08	1
\mathbf{Sr}^{+} - \mathbf{Sr}	108.5 ± 1.6	1	Tm ⁺–Br	312.2	1	Xe^+-N	66.4 ± 9.6	1
Ta⁺-C	369.4 ± 3.9	10	Tm⁺-Cl	407.9	1	Xe ⁺−Ne	2.1 ± 0.8	1
Ta^+-H	230 ± 6	1	Tm +−F	537 ± 16	1	Xe ⁺−Xe	99.6	1
Ta^+-O	688.7 ± 11.6	10	Tm +−I	266.8	1	Y+-C	281 ± 12	1
\mathbf{Ta}^+ \mathbf{Ta}	666	1	Tm +−O	482 ± 15	1	Y +-F	677 ± 21	1
$\mathbf{T}\mathbf{b}^{\scriptscriptstyle +} - \mathbf{C}\mathbf{u}$	245 ± 34	1	U+-Br	345 ± 29	1	Y+-H	260.5 ± 5.8	1
$\mathbf{T}\mathbf{b}^{\scriptscriptstyle +}\mathbf{-}\mathrm{O}$	722 ± 15	1	U+-C	300 ± 96	1	Y+-O	718 ± 25	1
$\mathbf{Tc}^{\scriptscriptstyle +}\!-\!H$	197.5	1	U+-Cl	431 ± 34	1	Y+-Pt	466 ± 192	1
$\mathbf{Tc}^{\scriptscriptstyle +}\mathbf{-}\mathrm{O}$	>167	1	U +-D	283.4 ± 9.6	1	Y +-S	533.9 ± 8	1
Te^+-H	305 ± 12	1	U+-F	668 ± 29	1	Y +-Si	243 ± 13	1
Te^+-O	339 ± 50	1	U⁺−H	284 ± 8	1	Y +-Te	360 ± 96	1
Te^+-P	415 ± 97	1	U+-N	~485	1	Y +-Y	281 ± 21	1
Te ⁺-Se	342 ± 19	1	U+-O	757 ± 42	1	Yb⁺-Br	307.4	1
Te^+-Si	339.6	5	U+-P	186	1	Yb+-Cl	399.6	1
$\mathbf{Te}^{\scriptscriptstyle +}\mathrm{-Te}$	278 ± 29	1	U+-S	518 ± 29	1	Yb +−F	557.5 ± 14.4	1
$\mathbf{T}\mathbf{h}^{\scriptscriptstyle +}\!-\!\mathrm{Cl}$	499 ± 29	1	V+-Ar	39.39 ± 0.12	1	Yb ⁺−I	262.0	1
$\mathbf{T}\mathbf{h}^{\scriptscriptstyle +}\mathbf{-}\mathbf{F}$	682 ± 29	1	V+-C	373 ± 13.5	1	Yb +-O	376 ± 15	1
Th^+-O	875 ± 16	1	V +-D	202 ± 6	1	Yb ⁺−Yb	238 ± 96	1
Th^+-Pt	388 ± 193	1	V+-Fe	314 ± 21	1	Zn ⁺-Ar	28.7 ± 1.2	1
$\mathbf{T}\mathbf{h}^{\scriptscriptstyle +}\mathbf{-}\mathbf{R}\mathbf{h}$	504 ± 67	1	V+-H	202 ± 6	1	Zn⁺-H	216 ± 15	1
Ti^+-C	395 ± 23	1	V+-Kr	49.46 ± 0.18	1	Zn +-O	161.1 ± 4.8	1
Ti⁺-Cl	426.8	1	V +-N	448.6 ± 5.8	1	Zn +−S	198 ± 12	1
Ti^+-F	≥456	1	V+-Nb	403.5 ± 0.2	1	Zn ⁺−Si	274.1 ± 9.6	1
Ti^+-H	226.6 ± 10.6	1	V+-O	581.6 ± 9.6	1	$\mathbf{Z}\mathbf{n}^{+}$ - $\mathbf{Z}\mathbf{n}$	60 ± 19	1
Ti^+-N	501 ± 13	1	V+-S	358.9 ± 8.7	1	Zr+-Ar	36.09 ± 0.24	1
Ti+-O	667 ± 7	1	V+-Si	229 ± 15	1	Z r ⁺ -C	445.8 ± 15.4	1
Ti⁺-Pt	82 ± 96	1	V +-V	302	1	Z r ⁺ -H	218.8 ± 9.6	1
Ti^+-S	461.1 ± 6.8	1	V+-Xe	66.4 ± 0.6	1	Z r ⁺ -N	443 ± 46	1
Ti⁺-Si	249 ± 16	1	W +-C	463.0 ± 8.7	10	Zr+-O	753 ± 11	1
$\mathbf{Ti}^{\scriptscriptstyle +}\!-\!\mathrm{Ti}$	229	1	W +-F	444 ± 96	1	Zr +-S	549.0 ± 9.6	1
Tl ⁺−Br	52 ± 50	1	W +-H	222.5 ± 5	1	Zr +-Zr	407.0 ± 9.6	1
Tl+-Cl	26 ± 4	1	W +-O	656.9 ± 6.8	10			
Tl^+-F	13 ± 21	1	Xe ⁺−Ar	13.4	1			

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TABLE 7. Bond Dissociation Energies in Polyatomic Cations

This Table has been arranged on the basis of the Periodic Table with the IUPAC notation for Groups 1 to 18, see inside front cover of this *Handbook*. The **boldface** in the species indicates the dissociated fragment.

Bond	$Do^2_{98}/\mathrm{kJ\ mol^{-1}}$	Ref.	Bond	$Do^2_{98}/\mathrm{kJ\ mol^{-1}}$	Ref.
(1) Crown 1			K⁺–adenine	95.1 ± 3.2	1
(1) Group 1	27.2	1	K ⁺–indole	104.6 ± 12.6	1
Li+-H ₂	27.2	1	K ⁺–Phe (phenylalanine)	150.5 ± 5.8	1
Li+-CO	57 ± 13	1	K ⁺−Tyr (tyrosine)	165.0 ± 5.8	1
Li+–H ₂ O	139 ± 8	1	Rb +–H ₂ O	66.9 ± 12.6	1
Li+-NH ₃	156 ± 8	1	$\mathbf{R}\mathbf{b}^{+}\!\!-\!\!\mathrm{NH}_{_{3}}$	78.2	1
Li+-CH ₄	130	1	Rb ⁺−CH₃CN	86.6 ± 1.3	1
Li ⁺ -CH ₃ OH	156 ± 8	1	Rb ⁺–C ₆ H ₅ OH	70.2 ± 3.7	1
Li ⁺ -CH ₃ OCH ₃	167 ± 10	1	Cs⁺–H ₂ O	57.3	1
Li ⁺ –pyridine	183.0 ± 14.5	1	$\mathbf{C}\mathbf{s}^{+}-\mathbf{C}_{s}\mathbf{H}_{s}\mathbf{N}\mathbf{H}_{s}$	70.8 ± 4.5	1
Li+-Gly (glycine)	220 ± 9	1	3 3 2		
Na^+-H_2	10.4 ± 0.8	1	(2) Group 2		
$\mathbf{Na}^{+}-\mathbf{N}_{2}$	33.5	1	$\mathbf{CH_{3}Be^{+}}$ - $\mathbf{CH_{3}}$	192.9 ± 13.4	1
Na ⁺ -CO	31 ± 8	1	tert-C(CH ₃) ₃ Be ⁺ - $tert$ -C(CH ₃) ₃	121.8 ± 13.4	1
Na ⁺ -CO ₂	66.5	1	Mg⁺–OH	314 ± 33	1
Na^+-SO_2	79.1	1	Mg⁺–CO	43.1 ± 5.8	1
Na^+-O_3	52.3	1	Mg^{+} – CO_{2}	58.4 ± 5.8	1
Na^+-H_2O	91.2 ± 6.3	1	$\mathbf{Mg}^{+}\!\!-\!\!\mathrm{H}_{2}^{}\mathrm{O}$	122.5 ± 12.5	1
$Na^+(H_2O)-H_2O$	82.0 ± 5.8	1	\mathbf{Mg}^{+} -NH $_{_{3}}$	158.9 ± 11.6	1
$Na^+(H_2O)_2-H_2O$	66.1	1	$\mathbf{Mg}^{\scriptscriptstyle{+}}\!\!-\!\!\mathrm{CH}_{_{4}}$	29.8 ± 6.8	1
$Na^+(H_2O)_3-H_2O$	52.7 ± 0.8	1	Mg ⁺–MeOH	147.6 ± 6.8	1
Na+(glycine)-H ₂ O	75.1 ± 5.3	1	\mathbf{Mg}^{+} $-\mathbf{C}_{6}\mathbf{H}_{6}$	155.2	1
Na+(glutamine)–H ₂ O	52 ± 1	1	$\mathbf{M}\mathbf{g}^{\scriptscriptstyle{+}}$ –pyridine	200.0 ± 6.4	1
Na^+-NH_3	106.2 ± 5.4	1	Mg ⁺–imidazole	243.9 ± 10.4	1
Na+-HNO ₃	86.2	1	$Mg^{2+}(H_2O)_5 - H_2O$	101.3	1
Na+-CH ₄	30.1	1	$Mg^{2+}(Me_2CO)_5$ - Me_2CO	93.3	1
Na+-CH ₃ OH	98.8 ± 5.7	1	Са+-ОН	435.1 ± 14.5	1
Na+-CH ₃ CN	125.5 ± 9.6	1	Ca⁺−H ₂ O	117.2	1
$Na^+-C_2H_4$	44.6 ± 4.4	1	\mathbf{Ca}^{+} $-\mathbf{C}_{6}\mathbf{H}_{6}$	134	1
Na+-CH ₃ OCH ₃	101.4 ± 5.7	1	Ca ⁺–imidazole	186.3 ± 3.9	1
Na+-CH ₃ C(O)H	114.4 ± 3.4	1	$Ca^{2+}(H_2O)_4-H_2O$	110.0 ± 5.9	1
Na+- MeCOMe	131.3 ± 4.1	1	$Ca^{2+}(Me_2CO)_5$ - Me_2CO	101.3	1
$Na^+-C_6H_6$	97.0 ± 5.9	1	Sr+-CO	20.3	1
Na+–pyrrole	103.7 ± 4.8	1	Sr ⁺ -CO ₂	41.9	1
Na+-Gly (glycine)	166.7 ± 5.1	1	Sr ⁺ –H ₂ O	144.3	1
Na+-Ala (alanine)	167 ± 4	1	\mathbf{Sr}^+ $-\mathbf{C}_6\mathbf{H}_6$	117	1
Na+-GlyGly (glycylglycine)	203 ± 8	1	$Sr^{2+}(H_2O)_5 - H_2O$	87.4	1
K +-H,	6.1 ± 0.8	1	Ba+–OH	530.7 ± 19.3	1
K +-CO ₂	35.6	1	$Ba^{2+}(H_2O)_4-H_2O$	90.8	1
K +–H ₂ O	74.9	1			
$\mathbf{K}^{+}(\mathbf{H}_{2}^{\mathbf{O}})_{2}-\mathbf{H}_{2}\mathbf{O}$	67.4	1	(3) Group 3		
$K^+(H_2O)_3-H_2O$	55.2	1	$\mathbf{Sc}^{+}\mathbf{-H}_{2}$	23.0 ± 1.3	1
$K^+(H_2O)_4-H_2O$	11.8	1	\mathbf{Sc}^+ – \mathbf{CH}_2	412 ± 22	1
$K^{+}(H_{2}O)_{5}-H_{2}O$	44.8	1	\mathbf{Sc}^{+} $ \mathbf{CH}_{_{3}}$	233 ± 10	1
$K^+(H_2O)_6 - H_2O$	41.8	1	$\mathbf{Sc}^{\text{+-}}\!$	240 ± 20	1
K +-NH ₂	79 ± 7	1	\mathbf{Sc}^{+} $\mathbf{-C}_{_{2}}\mathbf{H}_{_{4}}$	≥131	1
K+-C ₆ H ₆	80.3	1	\mathbf{Sc}^{+} $\mathbf{-C}_{_{6}}\mathbf{H}_{_{6}}$	222 ± 21	1
-6 6			\mathbf{Sc}^{+} $\mathbf{H}_{2}\mathrm{O}$	131	1

Bond	$Do^2_{98}/\mathrm{kJ\ mol^{-1}}$	Ref.	Bond	Do^2_{98} /kJ mol $^{-1}$	Ref.
Sc+-NH	483 ± 10	1	V+-CH	470 ± 5	1
\mathbf{Sc}^{+} $ \mathbf{NH}_{2}$	347 ± 5	1	V^+ – CH_2	326 ± 6	1
\mathbf{Sc}^{+} –pyridine	231.5 ± 10.3	1	V^+ – CH_3	193 ± 7	1
\mathbf{Y}^{+} $-\mathbf{CH}_{2}$	398 ± 13	1	V^+ – C_2H_2	172 ± 8	1
Y+-CH ₃	249 ± 5.0	1	$V^{+}-C_{2}H_{4}$	124 ± 8	1
Y+-C ₂ H ₂	218 ± 13	1	$V^{+}-(\eta^{5}-C_{5}H_{5})$	530.7	1
\mathbf{Y}^{+} $-\mathbf{C}_{2}\mathbf{H}_{4}$	>138	1	V^+ – $C_6^ H_6^-$	234 ± 10	1
Y+-CO	29.9 ± 10.6	1	V+-CO	114.8 ± 2.9	1
Y+-CS	137.0 ± 7.7	1	V^+ – CO_2	72.4 ± 3.8	1
$\mathbf{Y}^{+}(\mathbf{O})$ - \mathbf{CO}_{2}	86 ± 5	1	V^+ – H_2^- O	149.8 ± 5.0	1
La+-CH	523 ± 33	1	V+-NH	423 ± 29	1
$\mathbf{La}^{+}\!\!-\!\!\mathrm{CH}_{2}$	401 ± 7	1	V^+ – NH_2	293 ± 6	1
$\mathbf{La}^{+}\!\!-\!\!\mathrm{CH}_{_{3}}$	217 ± 15	1	V^+ -NH $_3$	192 ± 11	1
\mathbf{La}^{+} $-C_{2}\mathbf{H}_{2}$	262 ± 30	1	$\mathbf{V}^{\scriptscriptstyle{+}}$ –pyridine	218.7 ± 13.5	1
$\mathbf{La}^{+}\!\!-\!\!C_{_{2}}\mathbf{H}_{_{4}}$	192.5	1	V^+ –imidazole	\leq 243.4 ± 8.0	1
$\mathbf{L}\mathbf{u}^{\text{+}}\text{-}\mathrm{CH}_{2}$	$>$ 230 \pm 6	1	$\mathbf{Nb}^{\scriptscriptstyle +}\!\!-\!\!\mathrm{H}_{_2}$	61.9	1
$\mathbf{L}\mathbf{u}^{\scriptscriptstyle{+}}\!\!-\!\!\mathrm{CH}_{\scriptscriptstyle{3}}$	176 ± 20	1	Nb ⁺–CH	581 ± 19	1
U +(F)–F	552 ± 44	1	$\mathbf{Nb}^{\scriptscriptstyle +}\!\!-\!\!\mathrm{CH}_{\scriptscriptstyle 2}$	428.4 ± 8.7	1
$\mathbf{U}^{+}(\mathbf{F})_{2}\mathbf{-F}$	523 ± 38	1	\mathbf{Nb}^{+} $-\mathbf{CH}_{3}$	198.8 ± 10.6	1
$\mathbf{U}^{+}(\mathbf{F})_{3}\mathbf{-F}$	381 ± 19	1	\mathbf{Nb}^{+} $-\mathrm{CH}_{3}\mathrm{NH}_{2}$	134	1
$\mathbf{U}^{+}(\mathbf{F})_{4}\mathbf{-F}$	243 ± 17	1	$Nb^+-C_3H_6$	117.7	1
$\mathbf{U}^{+}(\mathbf{F})_{5}\mathbf{-F}$	26 ± 11	1	$(\mathbf{NbFe})^{+}-\mathbf{C}_{_{3}}\mathbf{H}_{_{4}}$	>163	1
(4) C 4			Nb ⁺–CO	95.5 ± 4.8	1
(4) Group 4 Ti⁺–CH	470 ± 5	1	Nb ⁺–CS	242.2 ± 10.6	1
	478 ± 5	1	\mathbf{Nb}_{7}^{+} $-\mathbf{N}_{2}$	<215	1
Ti+-CH ₂	391 ± 15	1	Ta⁺–CH	561.5 ± 15.4	6
Ti+-CH ₃ Ti+-CH ₄	213.8 ± 3	1	\mathbf{Ta}^{+} $-$ CH $_{2}$	464.1 ± 2.9	6
Ti+-C ₂ H ₂	70.3 ± 2.5 213 ± 13	1	Ta^+ – CH_3	259.5 ± 13.5	6
$Ti^+-C_2H_4$	146 ± 11	1	$Ta^+-C_6H_6$	251~301	1
$Ti^+-C_6H_6$	259 ± 9	1	(6) Group 6		
Ti+-CO	117.7 ± 5.8	1	(CO) ₆ Cr ⁺ –H	230 ± 10	1
Ti+-H ₂ O	157.7 ± 5.9	1	$(\eta^5-C_5H_5)(NO)(CO)_2Cr^+-H$	207.1 ± 14	1
Ti+-NH	466 ± 12	1	$\operatorname{Cr}^+-\operatorname{H}_2$	31.8 ± 2.1	1
Ti+-NH ₂	356 ± 13	1	Cr⁺-CH	294 ± 29	1
Ti+-NH ₃	197 ± 7	1	Cr+-CH ₂	216 ± 4	1
Ti⁺–pyridine	217.2 ± 9.3	1	Cr ⁺ –CH ₃	110 ± 4	1
Ti+–imidazole	\leq 232.4 ± 8.2	1	Cr ⁺ -C ₆ H ₆	170 ± 10	1
Zr ⁺ –CH	568 ± 13	1	Cr⁺–indole	196.6 ± 16.7	1
Zr ⁺ -CH ₂	444.8 ± 5	1	Cr*-CO	89.7 ± 5.8	1
Zr ⁺ -CH ₂	227.7 ± 9.6	1	Cr+-OH	298 ± 14	1
\mathbf{Zr}^{+} $-\mathbf{C}_{2}\mathbf{H}_{2}$	273 ± 14	1	Cr*–H ₂ O	132.6 ± 8.8	1
Zr ⁺ -CO	77 ± 10	1	Cr*-N ₂	59 ± 4	1
Zr+-CS	257.6 ± 10.6	1	Cr*-NH ₂	183 ± 10	1
Hf*-CH	492.1 ± 14.5	2	(CO) ₆ Mo ⁺ –H	260 ± 9	1
Hf*-CH,	421.6 ± 6.8	2	Mo ⁺ –CH	513.3 ± 13.5	1
Hf+-CH ₂	204.5 ± 25.1	2	Mo+-CH ₂	344.4 ± 10	1
Hf *-C ₂ H ₂	150.6	1	Mo+-CH ₂	151.5 ± 8.7	1
2 2			Mo+-CO	193.9 ± 9.6	1
(5) Group 5			Mo+-CO ₂	49.2 ± 7	1
(CO) ₆ V⁺−H	220 ± 14	1	Mo+-CS	162 ± 18	1
V +–H ₂	42.7 ± 2.1	1	$\mathbf{Mo}^{\scriptscriptstyle{+}}\!\!-\!\!\mathrm{CS}_{_{2}}$	67.5 ± 12.5	1

Bond	$Do^2_{98}/\mathrm{kJ\ mol^{-1}}$	Ref.	Bond	Do^2_{98} /kJ mol $^{-1}$	Ref.
Mo+-NH	<385	1	$\mathbf{Fe}^{\scriptscriptstyle +}\mathbf{-N}_{\scriptscriptstyle 2}$	53 ± 4	1
Mo ⁺–pyrrole	>289	1	\mathbf{Fe}^{+} $-\mathbf{NH}_{3}$	184 ± 12	1
$(CO)_6W^+-H$	257 ± 9	1	\mathbf{Fe}^+ - \mathbf{CS}_2	166.1 ± 4.6	1
W^+ -CH	580 ± 27	1	Fe ⁺ –imidazole	246.1 ± 13.8	1
\mathbf{W}^{+} $-CH_{2}$	456.4 ± 5.8	1	Fe ⁺ –SiH	254 ± 13	1
W^+ – CH_3	\sim 222.9 \pm 9.6	1	Fe ⁺ -SiH ₂	181 ± 9	1
$(PMe_3)_3(CO)_3W^+-H$	259.4	1	Fe ⁺ –SiH ₃	183 ± 9	1
W+-pyrrole	>209	1	$\mathbf{Ru}^{+}(\mathbf{\eta}^{5}-\mathbf{C}_{5}\mathbf{H}_{5})_{2}-\mathbf{H}$	292 ± 16	1
(E) C =			$(\eta^5$ - C_5 M e_5) ₂ Ru ⁺ -H	284.5	1
(7) Group 7	170 10	1	Ru ⁺–CH	501.7 ± 11.6	1
(CO) ₅ Mn ⁺ –H	172 ± 10	1	\mathbf{Ru}^{+} $-\mathbf{CH}_{2}$	344.4 ± 4.8	1
Mn+-H ₂	7.9 ± 1.7	1	\mathbf{Ru}^{+} $-\mathbf{CH}_{3}$	160.2 ± 5.8	1
Mn+-CH ₂	295 ± 13	1	Ru+-CS	253 ± 20	1
Mn+-CH ₃	215 ± 10	1	OsO_4^+ $-$ H	552 ± 13	1
$Mn^+(CO)_5$ -CH ₃	132 ± 15	1	(0) C 0		
$Mn^+(CO)_5$ -CH ₄	>30	1	(9) Group 9	045 10	1
$\mathbf{Mn}^{+} - (\eta^{5} - C_{5}H_{5})$	326.1 ± 9.6	1	$(\eta^5 - C_5 H_5)(CO)_2 Co^+ - H$	245 ± 12	1
$\mathbf{M}\mathbf{n}^{+}-\mathbf{C}_{6}\mathbf{H}_{6}$	145 ± 10	1	(CH ₃ OD)Co ⁺ –H	147.6 ± 7.7	1
Mn ⁺ -OH	332 ± 24	1	Co ⁺ -H ₂	76.1 ± 4.2	1
Mn+-CO	25 ± 10	1	$(\eta^5 - C_5 H_5) Co^+ - H_2$	67.8	1
Mn ⁺ -H ₂ O	121.8 ± 5.9	1	Co+-CH	420 ± 37	1
Mn+-CH ₃ OH	134 ± 29	1	Co+-CH ₂	317 ± 5	1
Mn ⁺ -OC(CH ₃) ₂	159 ± 14	1	Co+-CH ₃	203 ± 4	1
Mn+-CS	80.0 ± 21	1 1	Co ⁺ -CH ₄	96.7	1
Mn ⁺ -NH ₂	254 ± 20 147 ± 8	1	Co⁺−C ₆₀ Co⁺−CO	243 ± 67 173.7 ± 6.7	1
Mn ⁺ −NH ₃ Tc ⁺ −CH ₂	<464	1		173.7 ± 6.7 164.4 ± 5.9	1
Tc+-C ₂ H ₂	<320	1	Co⁺−H ₂ O Co⁺−CS	259 ± 33	1
$\operatorname{Re}^{+}(\operatorname{CH}_{3})(\operatorname{CO})_{5}-\operatorname{H}$	294 ± 13	1	Co+−N ₂	96.2 ± 7.1	1
$(PMe_3)(CO)_2Re^+-H$	300.4	1	Co+-NH ₂	247 ± 7	1
(1111c ₃)(00) ₂ 1cc 11	500.1		Co+-NH ₂	217 ± 7 219 ± 16	1
(8) Group 8			Co+-CH ₂ CN	$>255 \pm 17$	1
Fe ⁺ (O)–H	444 ± 17	1	$\mathbf{Co}^{+}-\mathbf{P}(\mathbf{CH}_{3})_{3}$	278 ± 11	1
Fe ⁺ (CO)–H	120 ± 23	1	$\mathbf{Co}^{+}-\mathbf{P}(\mathbf{C}_{2}\mathbf{H}_{5})_{3}$	339 ± 16	1
Fe ⁺ (H ₂ O)–H	215 ± 14	1	(CH) Rh ⁺ –H	372 ± 21	1
$Fe^+(\eta^5-C_5H_5)-H$	193 ± 21	1	(η ⁵ -C ₅ H ₅)(CO) ₂ Rh ⁺ -H	287 ± 12	1
$(CO_2)_5$ Fe ⁺ –H	299 ± 15	1	Rh+-CH	444 ± 12	1
$\mathbf{Fe}^{+}\!\!-\!\!\mathrm{H}_{2}$	45.2 ± 2.5	1	Rh+-CH ₂	356 ± 8	1
Fe ⁺ –CH	423 ± 29	1	Rh+-CH ₂	142 ± 6	1
Fe ⁺ -CH ₂	$\leq 342 \pm 2$	1	Rh ⁺–NO	167 ± 21	1
\mathbf{Fe}^+ $-\mathbf{CH}_3$	229 ± 5	1	Rh ⁺–CS	234 ± 19	1
Fe ⁺ -CH ₄	73.2	1	$(CO)(\eta^5-C_5H_5)(PPh_3)Ir^+-H$	313.4	1
Fe ⁺ –C ₂ H ₂	159.0 ± 2.1	1	$(CO)_2(\eta^5-C_5Me_5)Ir^+-H$	298.3	1
Fe ⁺ -C ₂ H ₃	238 ± 10	1	Ir ⁺–CH	666.7 ± 22.2	3
Fe ⁺ -C ₂ H ₄	145 ± 11	1	$\mathbf{Ir}^{\scriptscriptstyle +}\!\!-\!\!\mathrm{CH}_{\scriptscriptstyle 2}$	474.7 ± 2.9	3
Fe ⁺ -C ₂ H ₅	233 ± 9	1	Ir⁺-CH ₃	313.6 ± 17.4	3
Fe ⁺ -C ₂ H ₆	64 ± 6	1	$\mathbf{Ir}^{\scriptscriptstyle +}\!\!-\!\!\mathrm{C}_{_{2}}\!\mathrm{H}_{_{4}}$	234.3	1
Fe+-OH	366 ± 12	1	(10) Crown 10		
Fe+-CO Fe+D-CO	129.3 ± 3.9 53 ± 13	1 1	(10) Group 10	248 + 0	1
Fe ⁺ –CO ₂	53 ± 13 74.3 ± 7.7	1	(CO) ₄ Ni⁺−H (η⁵-C₅H₅)(NO)Ni⁺−H	248 ± 9 315 ± 14	1 1
Fe ⁺ -H ₂ O	128.9 ± 0.8	1	$(\eta^{5}-C_{5}H_{5})(\eta^{5}-C_{5}H_{5})Ni^{+}-H$	215 ± 13	1
1120	120.7 ± 0.0	-	(1) 5115/(1) 5115/141 -11	210 ± 10	1

Bond	$Do^2_{98}/\mathrm{kJ}~\mathrm{mol}^{-1}$	Ref.	Bond	$Do^2_{98}/\mathrm{kJ}\ \mathrm{mol}^{-1}$	Ref.
Ni^+-H_2	72.4 ± 1.3	1	$\mathbf{A}\mathbf{g}^{\scriptscriptstyle{+}}\!\!-\!\!\mathrm{O}_{_{2}}$	29.7 ± 0.8	1
Ni ⁺ –CH	301.0 ± 11.6	1	Ag ⁺ –CO	89 ± 5	1
Ni ⁺ -CH ₂	306 ± 4	1	$\mathbf{A}\mathbf{g}^{+}$ $-\mathrm{H}_{2}\mathrm{O}$	134 ± 8	1
Ni ⁺ -CH ₂	169.8 ± 6.8	1	Ag*-CS	152 ± 20	1
Ni ⁺ -CH	96.5 ± 4	1	$\mathbf{A}\mathbf{g}^{\scriptscriptstyle +}$ -NH $_{\scriptscriptstyle 2}$	170 ± 13	1
Ni ⁺ -OH	235 ± 19	1	Au*-CH ₂	357.0 ± 6.8	5
Ni ⁺ -CO	175 ± 11	1	Au*-CH ₂	209.4 ± 23.2	5
Ni ⁺ -CO ₂	104 ± 1	1	Au ⁺ -C ₂ H ₄	344.5	1
Ni+-H ₂ O	183.7 ± 3.3	1	Au +-C ₆ H ₆	289 ± 29	1
Ni+-CS	234.5 ± 9.6	1	Au ⁺ -CO	201 ± 8	1
Ni ⁺ -N ₂	110.9 ± 10.5	1	Au*-H ₂ O	164.0 ± 9.6	1
Ni+-NO	227.6 ± 7.5	1	Au ⁺ -H ₂ S	230 ± 25	1
Ni+-NH,	232.5 ± 7.7	1	$\mathbf{A}\mathbf{u}^+$ -NH ₂	297 ± 29	1
Ni ⁺ -NH ₂	238 ± 19	1	Au ⁺ –PH ₃	402 ± 33	1
Pd+–CH	536 ± 10	1	1123	102 = 00	-
Pd+-CH ₂	463 ± 3	1	(12) Group 12		
Pd+-CH ₂	258 ± 8	1	$\mathbf{Z}\mathbf{n}^{\scriptscriptstyle +}\!\!-\!\!\mathrm{H}_{\scriptscriptstyle 2}$	15.7 ± 1.7	1
Pd+-CH ₄	170.8 ± 7.7	1	$\mathbf{Z}\mathbf{n}^{\scriptscriptstyle +}\!\!-\!\!\operatorname{CH}_{\scriptscriptstyle 3}$	280 ± 7	1
Pd+-CS			Zn⁺–OH	127.2	1
	200 ± 14	1	$\mathbf{Z}\mathbf{n}^{\scriptscriptstyle +}\!\!-\!\!\mathrm{H}_{\scriptscriptstyle 2}\mathrm{O}$	163	1
Pd+-C ₂ H ₂	>28.9 ± 4.8	1	Zn⁺–NO	76.2 ± 9.6	1
Pt+-H ₂	146.7 ± 11.6	1	Zn ⁺–pyrimidine	209.6 ± 7.7	1
Pt+-CH	536.4 ± 9.6	1	Zn ⁺ -CS	149 ± 23	1
Pt+-CH ₂	471	1	Cd+-CH ₃	228 ± 3	1
Pt ⁺ -CH ₃	257.6 ± 7.7	1	Cd+(CH ₃)-CH ₃	109 ± 3	1
Pt+-CH ₄	170.8 ± 7.7	1	Cd ⁺ –C ₆ H ₆	136 ± 19	1
Pt *-O ₂	64.6 ± 4.8	1	Hg ⁺ –CH ₂	285 ± 3	1
Pt+-CO	218.1 ± 8.7	1	Hg ⁺ (CH ₂)–CH ₂	96 ± 3	1
Pt ⁺ -CO ₂	59.8 ± 4.8	1	- 3		
Pt ⁺ -NH ₃	274 ± 12	1	(13) Group 13		
$\mathbf{Pt}^{+}-\mathbf{C}_{2}\mathbf{H}_{4}$	229.7	1	\mathbf{B}^{+} \mathbf{H}_{2}	15.9 ± 0.8	1
(11) Group 11			$\mathbf{HB}^{+}\mathbf{-H}_{2}$	61.5 ± 2.1	1
Cu ⁺ –H ₂	51.9 ± 0.4	1	$(CH_3)_2B^+-CH_3$	32.6 ± 4.2	1
Cu ⁺ -CH ₂	267.3 ± 6.8	1	\mathbf{Al} + $\mathbf{-H}_2$	5.6 ± 0.6	1
Cu ⁺ -CH ₃	111 ± 7	1	\mathbf{Al}^{\downarrow} $-\mathbf{N}_{2}$	5.6	1
Cu ⁺ -C ₂ H ₂	>21.2 ± 9.6	1	Al ⁺ –CO ₂	≥29.3	1
$\mathbf{C}\mathbf{u}^{+}-\mathbf{C}_{2}\mathbf{H}_{4}$	176 ± 14	1	Al ⁺–H ₂ O	104 ± 15	1
$\mathbf{C}\mathbf{u}^{+}-\mathbf{C}_{6}\mathbf{H}_{6}$	218.0 ± 9.6	1	Al ⁺–MeOH	139.7	1
Cu ⁺ -CO	149 ± 7	1	Al ⁺–EtC(O)Et	191.2	1
Cu ⁺ -N ₂	89 ± 30	1	Al ⁺–C ₆ H ₆	147.3 ± 8.4	1
Cu ⁺ -NO	109.0 ± 4.8	1	Al ⁺–pyridine	190.3 ± 10.3	1
Cu+-H ₂ O	169.0 ± 4.8 160.7 ± 7.5	1	Al ⁺–phenol	154.8 ± 16.7	1
Cu ⁺ –NH ₂			Al ⁺–imidazole	232.4 ± 8.2	1
-	192 ± 13	1	\mathbf{Ga}^{+} $ \mathbf{NH}_{_{3}}$	122.5	1
Cut-CS	237 ± 15	1	In+-NH ₃	111.0	1
Cu+-CS	238.3 ± 11.6	1			
Cu+-SiH	246 ± 27	1	(14) Group 14		
Cu ⁺ -SiH ₂	≥231 ± 7	1	$C_{58^+-C_2}$	955 ± 15	1
Cu⁺−SiH ₃	97 ± 25	1	$C_{60}^{+}-C_{2}$	822.0 ± 12.5	1
\mathbf{Ag}^{+} $-\mathrm{CH}_{2}$	≥107 ± 4	1	$C_{62^{+-}C_2}$	846.2 ± 10.6	1
\mathbf{Ag}^{+} $-\mathbf{CH}_{3}$	66.6 ± 4.8	1	$\mathbf{C_{78}^{+}-C_{2}}$	938.8 ± 10.6	1
\mathbf{Ag}^{+} $-\mathbf{C}_{2}\mathbf{H}_{5}$	65.7 ± 7.5	1	HC ₂ +–H	574.749	1
\mathbf{Ag}^{+} $-\mathbf{C}_{6}\mathbf{H}_{6}$	167 ± 19	1	$C_6H_5^+-H$	376.3 ± 4.8	1

Bond	$Do^2_{98}/\text{kJ mol}^{-1}$	Ref.	Bond	$Do^2_{98}/\mathrm{kJ}\ \mathrm{mol}^{-1}$	Ref.
$C_2H_3^+$ -Cl	249 ± 1.0	7	$C_6F_6^+-C_6F_6$	30.1 ± 4	1
$C_2H_5^+$ -Br	206.3 ± 1.0	7	$C_{60}^{+}-C_{60}^{-}$	35.89 ± 7.72	1
$C_6H_5^+$ -Br	266.3	1	PhSiH ₂ +–H	159	1
$C_2H_3^+-I$	196.2 ± 1.4	7	$Si^+(CH_3)_3$ –Cl	178.5 ± 1.9	1
CH ₃ +-H ₂	186	1	SiH ₃ +-CO	≥151	1
$CH_5^+-H_2$	7.9 ± 0.4	1	SiF ₃ +-CO	174.1 ± 1.3	1
$C_2H_5^+-H_2$	17	1	$(CH_3)_3Si^+-H_2O$	125.9 ± 7.9	1
CH_3^+ $-O_2$	80 ± 7	4	$(CH_3)_3Si^+-NH_3$	194.6	1
$\mathbf{CO}^{\scriptscriptstyle +}\!\!-\!\!N_{_{2}}$	67.5 ± 19.3	1	$Si^+(CH_3)(Cl)_2$ - CH_3	60.8 ± 2.9	1
$H_2CH^+-N_2$	31.8	1	$Si^+(CH_3)_2(Cl)$ - CH_3	41.5 ± 1.9	1
CO+-CO	173.7 ± 14.6	1	Si ⁺ -CH ₃	413.9 ± 5.8	1
CO+(CO)-CO	52.3	1	Si ⁺ (CH ₃)-CH ₃	123 ± 48	1
CO+(CO) ₂ -CO	30.2	1	$Si^+(CH_3)_2$ - CH_3	513 ± 27	1
CO+(CO) ₃ -CO	18.4	1	$Si^+(CH_3)_3$ - CH_3	66.6 ± 5.8	1
(CO ₂)+-CO ₂	70.3	1	$(CH_3)_3Si^+$ - CH_3OH	164.0	1
$(CO_2)^+(CO_2)$ - CO_2	34.7	1	$(CH_3)_3Si^+-(C_2H_5)_2O$	184.9	1
$(CO_2)^+(CO_2)_2^ -CO_2$	21.3	1	$(CH_3)_3Si^+-C_6H_6$	100.0	1
$(CO_2)^+(CO_2)_3$ - CO_2	20.1 ± 1.3	1	$(CH_3)_3Si^+$ - CH_3NH_2	231.8	1
$CH_3^+-N_2^-O$	221.3	1	$(CH_3)_3Ge^+-H_2O$	119.7 ± 2.1	1
$CH_3^+-SO_2$	253.6	1	$(C_2H_5)_3Ge^+-H_2O$	104.2 ± 2.1	1
CH ₃ +-OCS	239.3	1	$(CH_3)_3Sn^+-NH_3$	154	1
$\mathbf{CH_3}^+$ $-\mathbf{CS_2}$	251.9	1	$(CH_3)_3Sn^+-H_2O$	108	1
$CH_3^+-H_2^-O$	279	1	$(CH_3)_3Sn^+-(CH_3)_2CO$	157	1
$CH_3^+(H_2O)-H_2O$	106.3	1	$(CH_3)_3Sn^+-C_3H_7SH$	143	1
$CH_3^+(H_2O)_2^-H_2O$	87.9	1	\mathbf{Pb}^{+} $ \mathbf{H}_{2}\mathbf{O}$	93.7	1
$CH_3^+(H_2^-O)_3^-H_2^-O$	61.9	1	\mathbf{Pb}^{+} $-\mathrm{NH}_{_{3}}$	118.4 ± 0.8	1
$CH_3^+(H_2^-O)_4^-H_2^-O$	48.5	1	\mathbf{Pb}^{+} - $\mathbf{CH}_{3}\mathbf{OH}$	97.5 ± 0.8	1
$CH_3^+-H_2^-S$	344.8	1	$\mathbf{Pb}^{\scriptscriptstyle +}$ - $\mathbf{CH}_{\scriptscriptstyle 3}\mathbf{NH}_{\scriptscriptstyle 2}$	148.1 ± 1.3	1
\mathbf{CH}_{2}^{+} $-\mathbf{CH}_{2}\mathbf{O}$	303.0 ± 2.9	1	$\mathbf{Pb}^{+}-\mathbf{C}_{6}\mathbf{H}_{6}$	110 ± 2	1
$CH_3^+-NH_3$	431.4	1	(15) Crown 15		
(CH ₃)+-CH ₃	209.2 ± 4.2	1	(15) Group 15	544 42 ± 0 10	1
$\mathbf{CH_{3}}^{+}$ $-\mathbf{CH_{4}}$	166.5	1	H ₂ N ⁺ -H	544.43 ± 0.10	1
$CF_3^+-CH_4$	19.0	1	H ₃ N ⁺ -H	515.1	1
(CH ₅)+-CH ₄	28.7 ± 1.3	1	Me ₃ N+-H	376 362	1 1
$C_6H_6^+$ - CH_4	12.0	1	Et ₃ N ⁺ -H		1
CH_3^+ - CH_3F	230	1	(imidazole)+ –Zn	216.1 ± 3.9	
CH ₃ +-CF ₃ Cl	221	1	N ₂ H ⁺ -H ₂	24.7 ± 0.8 14.2	1
CH ₃ +-CH ₃ Cl	259	1	ON+-O ₂	303.8	1
$tert$ - $C_4H_9^+$ - CH_3OH	63	1	\mathbf{N}^{+} - \mathbf{N}_{2} $\mathbf{O}\mathbf{N}^{+}$ - \mathbf{N}_{2}	21.3	1 1
$tert$ - $C_4H_9^+$ - CH_3CN	85	1	2	102.3 ± 14.6	1
$tert$ - $C_4H_9^+$ - SO_2F_2	43.5	1	N ₂ ⁺ -N ₂	102.5 ± 14.6 60.7	1
$CH_3^+ - C_2^- H_3^- O$	338.7 ± 2.9	1	HN ₂ ⁺ -N ₂		1
CH ₃ +-CF ₃ ClOCl	252	1	N ₃ ⁺ -N ₂	18.8 ± 1.3	1
$tert$ $C_4H_9^+$ - $(CH_3)_2S$	185	1	O ₂ N ⁺ -N ₂	19.2 ± 1.3	1
$tert$ - $C_4H_9^+$ - C_2H_5OH	85	1	$\mathbf{H_4N^+}$ - $\mathbf{N_2}$ $\mathbf{ON^+}$ - \mathbf{NO}	54 ± 21 59.4 ± 0.8	1
$tert$ - $C_4H_9^+$ - C_3H_8	27.6	1	ON-NO ON-CO	39.4 ± 0.8 27.2 ± 1.3	1
$tert$ - C_4H_9 + $-t$ - C_4H_9Cl	339	1	ON*-O ₂	<58	1
$\textbf{tert-C}_{\textbf{4}}\textbf{H}_{\textbf{9}}{}^{\textbf{+}}\!\!-\!\!(\textbf{CH}_{\textbf{3}})_{\textbf{3}}\textbf{CH}$	30.1	1	ON*-CO ₂	32.2	1
$\mathbf{tert}\text{-}\mathbf{C_{4}}\mathbf{H_{9}}^{\text{+}}\text{-}\mathbf{C_{6}}\mathbf{H_{6}}$	92	1	$N_2O^+-ON_2$	72.8 ± 6.3	1
$(C_6H_6)^+-C_6H_6$	73.6	1	NO+-ON ₂	72.8 ± 0.3 36.4 ± 0.8	1
$(C_6H_6)^+$ -indole	54.8	1	~	69.9 ± 4	
			(HON ₂)*-ON ₂	U7.7 ⊥ 任	1

Bond	$Do^2_{98}/\mathrm{kJ\ mol^{-1}}$	Ref.	Bond Do^2_{98} /kJ mol	1 Ref.
ON⁺−H ₂ O	95	1	(H ₃ O)⁺−CO ₂ 64.0	1
$\mathbf{ON}^+(\mathbf{H}_2\mathbf{O}) - \mathbf{H}_2\mathbf{O}$	67.4	1	$(H_3O)^+(CO_2)-CO_2$ 51.9	1
$ON^+(H_2O)_2-H_2O$	56.5	1	$(H_3O)^+(CO_2)_2$ - CO_2 43.9	1
$\mathbf{H}_{4}\mathbf{N}^{+}-\mathbf{H}_{2}\mathbf{O}$	86.2 ± 4.2	1	$(H_3O)^+(CO_2)_3$ - CO_2 18.0	1
$H_4N^+(H_2O)-H_2O$	72.8 ± 4.2	1	$O_2^+-ON_2$ 56.1 ± 4	1
$H_4N^+(H_2O)_2-H_2O$	57.3 ± 4.2	1	$(H_3O)^+-ON_2$ 70.7 ± 6.5	1
$H_4N^+(H_2O)_3-H_2O$	51.0	1	$(H_3O)^+(H_2O)-ON_2$ 50.6 ± 2.1	1
$H_4N^+(H_2O)_4-H_2O$	44.4	1	$(H_3O)^+(H_2O)_2$ -ON ₂ 42.7 ± 2.1	1
glycine)H+–H ₂ O	77.2 ± 11.0	1	$O_3^+-O_3$ 67.5 ± 39	1
tryptophan)H+–H,O	31.2 ± 2.5	1	OCIO+-OCIO 246 ± 48	1
ryptophanylglicine)H+-H,O	56.0 ± 5.3	1	O ₂ +-H ₂ O >67	1
I ₄ N+-H ₂ S	47.7	1	(OH)+(H ₂ O) ₂ -H ₂ O 87.4	1
(*(NH ₃)–NH ₃	108.8	1	$(OH)^+(H_2SO_4)(H_2O)_4 - H_2O$ 56.9	1
*(NH ₃) ₂ -NH ₃	69.5	1	$(OH)^+(H_2SO_4)(H_2O)_5 - H_2O$ 49.8	1
(*(NH ₃) ₃ -NH ₃	57.3	1	$(OH)^+(H_2SO_4)(H_2O)_6-H_2O$ 44.8	1
(*(NH ₃) ₄ –NH ₃	49.0	1	(H ₂ O)*-H ₂ O 164.0	1
(*(NH ₃) ₅ -NH ₃	29.3	1	(H ₃ O)*-H ₂ O 140.2	1
(*(NH ₃) ₆ -NH ₃	27.2	1	$(H_3O)^+(H_2O)-H_2O$ 93.3	1
H_4^+ - CH_4	15.0	1	$(H_3O)^+(H_2O)H_2O$ 71.1	1
N+-CH ₃ OH	97.6	1	$(H_3O)^+(H_2O)_3-H_2O$ 64.0	1
o ₂ N⁺−CH₃OH	80.3 ± 9.6	1	$(\mathbf{H_3O})^{+}(\mathbf{H_2O})_{4}^{-}\mathbf{H_2O}$ 54.4	1
CH ₃ CNH)+-CH ₃ CN	130.1 ± 9.6	1	$(\mathbf{H_3O})^+(\mathbf{H_2O})_5 - \mathbf{H_2O}$ 49.0	1
pyridineH)+–pyridine	105.4 ± 4	1	$(H_3O)^+(H_2O)_6 - H_2O$ 43.1	1
raline H)+–valine	86.6 ± 8.4	1	(HCOOH)H*-H ₂ O 100.8	1
etainH)+–betaine	139.9 ± 4.8	1	CH ₄ OH ₂ +-H ₂ O 115.6	1
AP+-H ₂ O	54.4	1	CH ₃ CHOH*-H ₂ O 104.6	1
T 2	48.1	1		1
4 ₄ P)⁺−PH ₃	257	1		1
sH ₂ ⁺ -H			(tetrahydrofuranH)+-H ₂ O 82.8	
As+ harran	106 ± 17	1	(furanH)+-H ₂ O 43.5	1
As+–benzene	77 ± 17	1	furane*-H ₂ O 41.0	1
i+–H ₂ O	95.4	1	(phenol)+-H ₂ O 78.0	1
i ⁺ –NH ₃	149	1	(1-naphthol)*-H ₂ O 66.4	1
\mathbf{i}^{+} – $\mathbf{C}_{6}\mathbf{H}_{6}$	≤149	1	H ₃ O+-HC(O)H 137.7	1
.6) Group 16			H ₃ O ⁺ −NH ₃ 229.3	1
H ₃ O)+-H ₂	14.6 ± 2.1	1	$H_3O^+(NH_3)-NH_3$ 77.0	1
3	179.5	1	$H_3O^+(NH_3)_2-NH_3$ 71.5	1
$\mathbf{O}^{+}(\mathbf{O_2})_1 - \mathbf{O_2}$	28.9	1	$H_3O^+(NH_3)_3-NH_3$ 62.8	1
$(\mathbf{O}_2)_1 = 0_2$	3.9	1	H ₃ O ⁺ −PH ₃ 144	1
0 ₂ +-O ₂	38.3 ± 2.1	1	$\mathbf{H_3O^+-SO_3}$ 74	1
$O_2^+(O_2) - O_2$	24.6 ± 1.3	1	(HCOOH) ⁺ − HCOOH 96.5 ± 9.6	1
$O_2^+(O_2) = O_2$	10.4 ± 0.8	1	H ₃ O ⁺−CH ₄ 33.5	1
$O_2^+(O_2)_3^-O_2$	9.0 ± 0.8	1	$(CH_3OH)^+$ - CH_3OH 115.8 ± 19.3	1
$O_2^+(O_2)_4^-O_2$	8.0 ± 0.8	1	$CH_3OH_2^+$ - CH_3OH 136.4	1
$V_{2}^{+}(O_{2})_{4}^{-}O_{2}^{-}$ $V_{2}^{+}(O_{2})_{5}^{-}O_{2}^{-}$	7.9 ± 1.3	1	H ₃ O *–CH ₃ CN 195.4	1
+-N ₂	231.4	1	furan *–furan 94.1	1
-	22.6	1	BH ⁺–B, B = tetrahydofuran 125.1	1
0 ₂ +-N ₂			S +-CS ₂ 166	1
I ₃ O)+-N ₂	22.2 ± 2.1	1	CS *–CS ₂ 150.6	1
) ₄ +-N ₂	12.3	1	$\mathbf{CS_2}^+$ - $\mathbf{CS_2}$ 104.2	1
O ₂ +-CO	31.8	1	$HCS_2^+-CS_2$ 46.4	1
0 2+-CO2	41.0 ± 2.1	1	OS +-SO ₂ 57.7	1

Bond	$Do^2_{98}/\mathrm{kJ\ mol^{-1}}$	Ref.	Bond	$Do^2_{98}/\mathrm{kJ\ mol^{-1}}$	Ref.
$\mathbf{O}_2\mathbf{S}^{\scriptscriptstyle +} ext{-}\mathrm{SO}_2$	63.6	1	$\mathbf{He}^{\scriptscriptstyle +}(\mathbf{He})_{\scriptscriptstyle 2}$ $-\mathrm{He}$	2.7 ± 0.6	1
OCS+-OCS	100.0	1	$Ne^+(Ne)$ -Ne	10.3 ± 0.6	1
$\mathbf{OCS}^{\scriptscriptstyle +}\!\!-\!\!\mathrm{CO}_{\scriptscriptstyle 2}$	72.0	1	$Ne^+(Ne)_2$ -Ne	3.3 ± 0.6	1
\mathbf{SO}_{2}^{+} $-\mathbf{CO}_{2}$	42.7	1	$\mathbf{Ar}^{\scriptscriptstyle +}(\mathbf{Ar})$ $-$ Ar	20.4 ± 0.6	1
$\mathbf{H_{3}S^{+}}$ $-\mathbf{H_{2}O}$	91.6	1	$\mathbf{Ar}^{\scriptscriptstyle +}(\mathbf{Ar})_2^{\scriptscriptstyle -}$ \mathbf{Ar}	7.0 ± 0.6	1
thiophene H^+ – H_2^- O	42.7	1	$\mathbf{Ar}^{+}(\mathbf{N}_{2})$ -Ar	25.1	1
$\mathbf{H_{3}S^{+}}$ $-\mathbf{H_{2}S}$	53.6 ± 6.3	1	$\mathbf{Ar}^{+}(\mathbf{N}_{2})(\mathbf{Ar})$ $-\mathbf{Ar}$	7.1	1
$\mathbf{H_{3}S^{+}}$ $-\mathrm{CH}_{4}$	16.3	1	$\mathbf{Ar}^{+}(\mathbf{N}_{2})(\mathbf{Ar})_{2}$ -Ar	7.1	1
$(CH_3)_2Se^{\bullet+}-Se(CH_3)_2$	\sim 95 \pm 3	1	Kr +(Kr)–Kr	23.3 ± 0.6	1
$(CH_3)_2 Te^{\bullet_+} - Te(CH_3)_2$	97 ± 2	1	$\mathbf{Kr}^{\scriptscriptstyle +}(\mathbf{Kr})_{\scriptscriptstyle 2}^{\scriptscriptstyle -}\mathrm{Kr}$	9.0 ± 0.6	1
(17) C 17			$Xe^{+}(Xe)$ —Xe	25.2 ± 0.6	1
(17) Group 17 HF⁺–HF	≥138	1	$\mathbf{Xe}^{\perp}(\mathbf{Xe})_{2}^{-}\mathbf{Xe}$	11.0 ± 0.6	1
	≥138 39.6	1	$\mathbf{Ar}^{+}\!\!-\!\!\mathrm{H}_{_{2}}$	93.7	1
(H ₂ Cl)+ −Cl HCl+−HCl			$\mathbf{Ar}^{+}\!\!-\!\!\mathrm{N}_{_{2}}$	127.6	1
	83.9	1	$\mathbf{Ar}^{+}(\mathbf{N}_{2})-\mathbf{N}_{2}$	31.0	1
Cl+-CCl ₃	446.7 ± 9.6	1	$\mathbf{Ar}^{\scriptscriptstyle +}\!\!\left(\mathbf{N}_{_{2}}\!\right)_{_{2}}\!\!-\!\!\mathrm{N}_{_{2}}$	10.9	1
Cl ⁺ -C ₂ H ₃	685.0 ± 4.8	1	Ar ⁺ –CO	75 ± 17	1
HBr+-HBr	96	1	Ar ⁺ (CO)–CO	13	1
I+-CH ₃	330.0	1	Kr ⁺ -CO	103.3 ± 7.5	1
I ⁺ (CH ₃ I)–CH ₃	51.1	1	\mathbf{Kr}^+ $-\mathbf{CO}_2$	79.1 ± 2.9	1
$\mathbf{I}^{+}(\mathbf{CH_{3}I})_{2}$ $-\mathbf{CH_{3}}$	112.9	1	- -		
(18) Group 18					
$He^{+}(He)_{1}$ – He	17.6	1			

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