

CRC

HANDBOOK OF
CHEMISTRY
and
PHYSICS

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Editor-in-Chief

86TH
EDITION
2005-2006

PHYSICAL CONSTANTS OF INORGANIC COMPOUNDS

The compounds in this table were selected on the basis of their laboratory and industrial importance, as well as their value in illustrating trends in the variation of physical properties with position in the periodic table. An effort has been made to include the most frequently encountered inorganic substances; a limited number of organometallics are also covered. Many, if not most, of the compounds that are solids at ambient temperature can exist in more than one crystalline modification. The information given here applies to the most stable or common crystalline form. In cases where two or more forms are of practical importance, separate entries will be found in the table.

Compounds are arranged primarily in alphabetical order by the most commonly used name. However, adjustments are made in many instances in order to bring closely related compounds together. For example, hydrides of elements such as boron, silicon, and germanium are grouped together immediately following the entry for the parent element, since they would otherwise be scattered throughout the table. Likewise, the oxoacids of an element are given in one group whenever a strict alphabetical order would separate them (e.g., sulfuric acid and fluorosulfuric acid). The Formula Index following the table provides another means of locating a compound. There is also an index to CAS Registry Numbers.

The following data fields appear in the table:

- ◆ **Name:** Systematic name for the substance. The valence state of a metallic element is indicated by a Roman numeral, e.g., copper in the +1 state is written as copper(I) rather than cuprous, iron in the +3 state is iron(III) rather than ferric.
- ◆ **Formula:** The simplest descriptive formula is given, but this does not necessarily specify the actual structure of the compound. For example, aluminum chloride is designated as $AlCl_3$, even though a more accurate representation of the structure in the solid phase (and, under some conditions, in the gas phase) is Al_2Cl_6 . A few exceptions are made, such as the use of Hg_2^{2+} for the mercury(I) ion.
- ◆ **CAS Registry Number:** Chemical Abstracts Service Registry Number. An asterisk (*) following the CAS RN for a hydrate indicates that the number refers to the anhydrous compound. In most cases the generic CAS RN for the compound is given rather than the number for a specific crystalline form or mineral.
- ◆ **Mol. Weight:** Molecular weight (relative molar mass) as calculated with the 1997 IUPAC Recommended Atomic Weights. The number of decimal places corresponds to the number of places in the atomic weight of the least accurately known element (e.g., one place for lead compounds, two places for compounds of selenium, germanium, etc.);

a maximum of three places is given. For compounds of radioactive elements for which IUPAC makes no recommendation, the mass number of the isotope with longest half-life is used, and the result is rounded to the nearest integer.

- ◆ **Physical Form:** The crystal system is given, when available, for compounds that are solid at room temperature, together with color and other descriptive features. Abbreviations are listed below.
- ◆ **mp:** Normal melting point in °C. The notation "tp" indicates the temperature at which solid, liquid, and gas are in equilibrium at a pressure greater than one atmosphere (i.e., the normal melting point does not exist). When available, the triple point pressure is listed.
- ◆ **bp:** Normal boiling point in °C (referred to 101.325 kPa or 760 mmHg pressure). The notation "sp" following the number indicates the temperature where the pressure of the vapor in equilibrium with the solid reaches as 101.325 kPa. See Reference 8, p. 23, for further discussion of sublimation points and triple points. A notation "sublimes" without a temperature being given indicates that there is a perceptible sublimation pressure above the solid at ambient temperatures.
- ◆ **Density:** Density values for solids and liquids are always in units of grams per cubic centimeter and can be assumed to refer to temperatures near room temperature unless otherwise stated. Values for gases are the calculated ideal gas densities in grams per liter at 25°C and 101.325 kPa; the unit is always specified for a gas value.
- ◆ **Aqueous Solubility:** Solubility is expressed as the number of grams of the compound (excluding any water of hydration) that will dissolve in 100 g of water. The temperature in °C is given as a superscript. Solubility at other temperatures can be found for many compounds in the table "Aqueous Solubility of Inorganic Compounds at Various Temperatures" in Section 8.
- ◆ **Qualitative Solubility:** Qualitative information on the solubility in other solvents (and in water, if quantitative data are unavailable) is given here. The abbreviations are:
 - i insoluble
 - sl slightly soluble
 - s soluble
 - vs very soluble

Data were taken from a wide variety of reliable sources, including monographs, treatises, review articles, evaluated compilations and databases, and in some cases the primary literature. Some of the most useful references for the properties covered here are listed below.

List of Abbreviations

Ac - acetyl	blk - black	cub - cubic	exp - explodes, explosive
ace - acetone	brn - brown	cyhex - cyclohexane	flam - flammable
acid - acid solutions	bz - benzene	dec - decomposes	gl - glass, glassy
alk - alkaline solutions	chl - chloroform	dil - dilute	grn - green
amorp - amorphous	col - colorless	diox - dioxane	hc - hydrocarbon solvents
anh - anhydrous	conc - concentrated	eth - ethyl ether	hex - hexagonal
aq - aqueous	cry - crystals, crystalline	EtOH - ethanol	hp - heptane

hex - hexane
 hyd - hydrate
 hyg - hygroscopic
 i - insoluble in
 liq - liquid
 MeOH - methanol
 mono - monoclinic
 octahed - octahedral
 oran - orange
 orth - orthorhombic
 os - organic solvents

peth - petroleum ether
 pow - powder
 prec - precipitate
 pur - purple
 py - pyridine
 reac - reacts with
 refrac - refractory
 rhom - rhombohedral
 s - soluble in
 silv - silvery
 sl - slightly soluble in

soln - solution
 sp - sublimation point
 stab - stable
 subl - sublimes
 temp - temperature
 tetr - tetragonal
 thf - tetrahydrofuran
 tol - toluene
 tp - triple point
 trans - transition, transforma-
 tion

tricl - triclinic
 trig - trigonal
 unstab - unstable
 viol - violet
 visc - viscous
 vs - very soluble in
 wh - white
 xyl - xylene
 yel - yellow

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No.	Name	Formula	CAS Reg No.	Mol. weight	Physical form	mp/°C	bp/°C	Density g cm ⁻³	Solubility g/100 g H ₂ O	Qualitative solubility
1	Actinium	Ac	7440-34-8	227	silv metal; cub	1051	3198	10		
2	Actinium bromide	AcBr ₃	33689-81-5	467	wh hex cry		800 subl	5.85		s H ₂ O
3	Actinium chloride	AcCl ₃	22986-54-5	333	wh hex cry		960 subl	4.81		
4	Actinium fluoride	AcF ₃	33689-80-4	284	wh hex cry			7.88		i H ₂ O
5	Actinium iodide	AcI ₃	33689-82-6	608	wh cry					s H ₂ O
6	Actinium oxide	Ac ₂ O ₃	12002-61-8	502	wh hex cry	1977		9.19		i H ₂ O
7	Aluminum	Al	7429-90-5	26.982	silv-wh metal; cub cry	660.32	2519	2.70		i H ₂ O, s acid, alk
8	Aluminum ammonium sulfate	AlNH ₄ (SO ₄) ₂	7784-25-0	237.148	wh powder					sl H ₂ O, i EtOH
9	Aluminum ammonium sulfate dodecahydrate	AlNH ₄ (SO ₄) ₂ · 12H ₂ O	7784-26-1	453.331	col cry or powder	94.5	>280 dec	1.65		s H ₂ O, i EtOH
10	Aluminum antimonide	AlSb	25152-52-7	148.742	cub cry	1065		4.26		
11	Aluminum arsenide	AlAs	22831-42-1	101.903	oran cub cry; hyg	1740		3.76		
12	Aluminum borate	2Al ₂ O ₃ · B ₂ O ₃	11121-16-7	273.543	needles	≈1050				i H ₂ O
13	Aluminum boride	AlB ₂	12041-50-8	48.604	powder	>920 dec		3.19		s dil HCl
14	Aluminum borohydride	Al(BH ₄) ₃	16962-07-5	71.510	flam liq	-64.5	44.5			reac H ₂ O
15	Aluminum bromate nonahydrate	Al(BrO ₃) ₃ · 9H ₂ O	11126-81-1*	572.826	wh hyg cry	62	>100 dec			s H ₂ O
16	Aluminum bromide	AlBr ₃	7727-15-3	266.694	wh-yel monocl cry; hyg	97.5	255	3.2		reac H ₂ O, s bz, tol
17	Aluminum bromide hexahydrate	AlBr ₃ · 6H ₂ O	7784-11-4	374.785	col-yel hyg cry	93		2.54		s H ₂ O, EtOH, CS ₂
18	Aluminum carbide	Al ₄ C ₃	1299-86-1	143.958	yel hex cry	2100	>2200 dec	2.36		reac H ₂ O
19	Aluminum chlorate nonahydrate	Al(ClO ₃) ₃ · 9H ₂ O	15477-33-5	439.472	hyg cry					vs H ₂ O, s EtOH

No.	Name	Formula	CAS Reg No.	Mol. weight	Physical form	mp/°C	bp/°C	Density g cm ⁻³	Solubility g/100 g H ₂ O	Qualitative solubility
365	Bismuth tungstate	Bi ₂ (WO ₆) ₃	13595-87-4	1161.47	wh pow					
366	Bismuth vanadate	BiVO ₄	14059-33-7	323.920	orth cry		trans 500	6.25		i H ₂ O, s acid
367	Boron	B	7440-42-8	10.811	blk rhomb cry	2075	4000	2.34		i H ₂ O
368	Diborane	B ₂ H ₄	19287-45-7	27.670	col gas, flam	-165.5	-92.4	1.131 g/L		react H ₂ O
369	Tetraborane(10)	B ₄ H ₁₀	18283-93-7	53.323	col gas	-121	18	2.180 g/L		react H ₂ O
370	Pentaborane(9)	B ₅ H ₉	19624-22-7	63.126	flam liq	-46.6	60	0.60		react hot H ₂ O
371	Pentaborane(11)	B ₅ H ₁₁	18433-84-6	65.142	col liq, unstable	-122	65			react H ₂ O
372	Hexaborane(10)	B ₆ H ₁₀	23777-80-2	74.945	col liq	-62.3	108 dec	0.67		react hot H ₂ O
373	Hexaborane(12)	B ₆ H ₁₂	12008-19-4	76.961	col liq, unstable	-82.3	≈80			react H ₂ O
374	Nonaborane(15)	B ₉ H ₁₅	19465-30-6	112.418	col liq	2.6				
375	Decaborane(14)	B ₁₀ H ₁₄	17702-41-9	122.221	wh orth cry	99.6	≈213	0.94		sl H ₂ O, s EtOH, bz, CS ₂ , ctc
376	Borane carbonyl	BH ₃ CO	13205-44-2	41.845	col gas	-137	-64	1.710 g/L		react H ₂ O
377	Borazine	B ₃ N ₃ H ₃	6569-51-3	80.501	col liq	-58	53	0.824		react H ₂ O
378	Boric acid (orthoboric acid)	H ₃ BO ₃	10043-35-3	61.833	col tric cry	170.9		1.5	5.80 ^{2b}	sl EtOH
379	Metaboric acid (α form)	HBO ₂	13460-50-9	43.818	col orth cry, hyg	176		1.784		s H ₂ O
380	Metaboric acid (β form)	HBO ₂	13460-50-9	43.818	col monoc cry, hyg	201		2.045		s H ₂ O
381	Metaboric acid (γ form)	HBO ₂	13460-50-9	43.818	col cub cry	236		2.487		s H ₂ O
382	Tetrafluoroboric acid	BF ₄	16872-11-0	87.813	col liq		130 dec	≈1.8		vs H ₂ O, EtOH
383	Boron arsenide	BAs	12005-69-5	85.733	cub cry	920 dec		5.22		
384	Boron tribromide	BBr ₃	10294-33-4	250.523	col liq, hyg	-45	91	2.6		react H ₂ O, EtOH
385	Boron carbide	B ₄ C	12069-32-8	55.255	hard blk cry	2350	>3500	2.50		i H ₂ O, acid
386	Boron trichloride	BCl ₃	10294-34-5	117.169	col liq or gas	-107	12.65	4.789 g/L		react H ₂ O, EtOH
387	Tetrachlorodiborane	B ₂ Cl ₄	13701-67-2	163.433	col liq; flam	-92.6	65			react H ₂ O
388	Boron trifluoride	BF ₃	7637-07-2	67.806	col gas	-126.8	-101	2.772 g/L		s H ₂ O
389	Tetrafluorodiborane	B ₂ F ₄	13965-73-6	97.616	col gas; flam	-56	-34	3.990 g/L		react H ₂ O
390	Boron triiodide	BI ₃	13517-10-7	391.524	wh needles	49.7	209.5	3.35		i H ₂ O
391	Boron nitride	BN	10043-11-5	24.818	wh powder; hex or cub cry	2966		2.18		i H ₂ O, acid
392	Boron oxide	B ₂ O ₃	1303-86-2	69.620	col gl or hex cry; hyg	450		2.55	2.2 ^{2b}	s EtOH
393	Boron phosphide	BP	20205-91-8	41.785	red cub cry or powder	1125 dec				react H ₂ O, acid
394	Boron sulfide	B ₂ S ₃	12007-33-9	117.820	yel amorp solid	softens ≈320		≈1.7		
395	Bromine	Br ₂	7726-95-6	159.808	red liq	-7.2	58.8	3.1028		sl H ₂ O
396	Bromic acid	HBrO ₃	7789-31-3	128.910	stable only in aq soln					s H ₂ O
397	Bromine oxide	Br ₂ O	21308-80-5	175.807	brn solid	-17.5 dec				
398	Bromine dioxide	BrO ₂	21255-83-4	111.903	unstable yel cry	≈0 dec				
399	Bromine azide	BrN ₃	13973-87-0	121.924	red cry; exp	≈45	exp			
400	Bromine chloride	BrCl	13863-41-7	115.357	unstable red-brn gas	≈-66	≈5 dec	4.715 g/L		react H ₂ O, s eth, CS ₂
401	Bromine fluoride	BrF	13863-59-7	98.902	unstable red-brn gas	≈-33	≈20 dec	4.043 g/L		
402	Bromine trifluoride	BrF ₃	7787-71-5	136.899	col hyg liq	8.77	125.8	2.803		react H ₂ O
403	Bromine pentafluoride	BrF ₅	7789-30-2	174.896	col liq	-60.5	40.76	2.460		react H ₂ O (exp)
404	Bromyl fluoride	BrO ₂ F	22585-64-4	130.901	col liq	-9	50 dec			react H ₂ O
405	Cadmium	Cd	7440-43-9	112.411	silv-wh metal	321.069	767	8.69		i H ₂ O; react acid
406	Cadmium acetate	Cd(C ₂ H ₃ O ₂) ₂	543-90-8	230.500	col cry	255		2.34		s H ₂ O, EtOH
407	Cadmium acetate dihydrate	Cd(C ₂ H ₃ O ₂) ₂ · 2H ₂ O	5743-04-4	266.529	wh cry	130 dec		2.01		vs H ₂ O, s EtOH
408	Cadmium antimonide	CdSb	12014-29-8	234.171	orth cry	456		6.92		
409	Cadmium arsenide	Cd ₃ As ₂	12006-15-4	487.076	gray telr cry	721		6.25		
410	Cadmium azide	Cd(N ₃) ₂	14215-29-3	196.451	yel-wh orth cry; exp			3.24		
411	Cadmium bromide	CdBr ₂	7789-42-6	272.219	wh hex powder or flakes; hyg	568	844	5.19	115 ^{2b}	sl ace, eth
412	Cadmium bromide tetrahydrate	CdBr ₂ · 4H ₂ O	13464-92-1	344.281	wh-yel cry				115 ^{2b}	s ace, EtOH
413	Cadmium carbonate	CdCO ₃	513-78-0	172.420	wh hex cry	500 dec		4.258		i H ₂ O, s acid
414	Cadmium chlorate dihydrate	Cd(ClO ₄) ₂ · 2H ₂ O	22750-54-5	315.343	col hyg cry	80 dec		2.28	2.64 ⁰	
415	Cadmium chloride	CdCl ₂	10108-64-2	183.316	rhomb cry, hyg	564	960	4.08	120 ^{2b}	s ace, sl EtOH; i eth
416	Cadmium chloride hemipentahydrate	CdCl ₂ · 2.5H ₂ O	7790-78-5	228.354	wh rhomb leaflets			3.327	120 ^{2b}	s ace
417	Cadmium chloride monohydrate	CdCl ₂ · H ₂ O	34330-64-8	201.331	wh cry				120 ^{2b}	

Name	Formula	CAS Reg No.	Mol. weight	Physical form	mp/°C	bp/°C	Density g cm ⁻³	Solubility g/100 g H ₂ O	Qualitative solubility
983 Hafnium oxide	HfO ₂	12055-23-1	210.49	wh cub cry	2774		9.68		i H ₂ O
986 Hafnium oxychloride octahydrate	HfOCl ₂ · 8H ₂ O	14456-34-9	409.52	wh tetr cry	dec				s H ₂ O
Hafnium phosphide	HfP	12325-59-6	209.46	hex cry			9.78		
Hafnium selenide	HfSe ₂	12162-21-9	336.41	brn hex cry			7.46		
989 Hafnium orthosilicate	HfSiO ₄	13870-13-8	270.57	tetr cry			7.0		
990 Hafnium silicide	HfSi ₂	12401-56-8	234.66	gray orth cry	≈1700		7.6		
991 Hafnium sulfate	Hf(SO ₄) ₂	15823-43-5	370.62	wh cry	>500 dec				
992 Hafnium sulfide	HfS ₂	18855-94-2	242.62	purp-brn hex cry			6.03		
993 Helium	He	7440-59-7	4.003	col gas		-268.93	0.164 g/L		sl H ₂ O, i EtOH
994 Holmium	Ho	7440-60-0	164.930	silv metal; hex	1474	2700	8.80		s dil acid
995 Holmium bromide	HoBr ₃	13825-76-8	404.642	yel hyg cry	919	1470			
996 Holmium chloride	HoCl ₃	10138-62-2	271.268	yel monocl cry; hyg	718	1500	3.7		s H ₂ O
1007 Holmium fluoride	HoF ₃	13760-78-6	221.925	pink-yel orth cry; hyg	1143	>2200	7.664		s H ₂ O
1008 Holmium iodide	HoI ₃	13813-41-7	545.643	yel hex cry	994		5.4		
1009 Holmium nitride	HoN	12029-81-1	178.937	cub cry			10.6		
1000 Holmium oxide	Ho ₂ O ₃	12055-62-8	377.859	yel cub cry	2330	3900	8.41		s acid
1001 Holmium silicide	HoSi ₂	12136-24-2	221.101	hex cry			7.1		
1002 Holmium sulfide	Ho ₂ S ₃	12162-59-3	426.059	yel-oran monocl cry			5.92		
1003 Hydrazine	N ₂ H ₄	302-01-2	32.045	col oily liq	1.4	113.55	1.0036		vs H ₂ O, EtOH, MeOH
1004 Hydrazine hydrate	N ₂ H ₄ · H ₂ O	7803-57-8	50.060	fuming liq	-51.7	119	1.030		vs H ₂ O, EtOH, i chl, eth
1005 Hydrazine hydrobromide	N ₂ H ₄ · HBr	13775-80-9	112.957	wh monocl cry flakes	84	≈190 dec	2.3		s H ₂ O, EtOH
1006 Hydrazine hydrochloride	N ₂ H ₄ · HCl	2644-70-4	68.506	wh orth cry	89	240 dec	1.5		s H ₂ O; i os
1007 Hydrazine dihydrochloride	N ₂ H ₄ · 2HCl	5341-61-7	104.966	wh orth cry	198 dec		1.42		s H ₂ O, sl EtOH
1008 Hydrazine hydroiodide	N ₂ H ₄ · HI	10039-55-1	159.957	hyg cry	125				s H ₂ O
1009 Hydrazine nitrate	N ₂ H ₄ · HNO ₃	13464-97-6	95.058	monocl cry; exp	70				vs H ₂ O
1010 Hydrazine sulfate	N ₂ H ₄ · H ₂ SO ₄	10034-93-2	130.125	col orth cry	254		1.378		sl H ₂ O, i EtOH
1011 Hydrazoic acid	HN ₃	7782-79-8	43.028	col liq; exp	-80	35.7			s H ₂ O
1012 Hydroxylamine	H ₂ NOH	7803-49-8	33.030	wh orth flakes or needles	33.1	58	1.21		vs H ₂ O, MeOH
1013 Hydroxylamine sulfate	(H ₂ NOH) ₂ · H ₂ SO ₄	10039-54-0	164.139	cry	170				vs H ₂ O
1014 Hydrogen	H ₂	1333-74-0	2.016	col gas; flam	-259.198 tp	-252.762	0.082 g/L		sl H ₂ O
1015 Hydrogen bromide	HBr	10035-10-6	80.912	col gas	-86.80	-66.38	3.307 g/L		vs H ₂ O; s EtOH
1016 Hydrogen chloride	HCl	7647-01-0	36.461	col gas	-114.17	-85	1.490 g/L		vs H ₂ O
1017 Hydrogen chloride dihydrate	HCl · 2H ₂ O	13465-05-9	72.492	col liq	-17.7		1.46		
1018 Hydrogen cyanide	HCN	74-90-8	27.026	col liq	-13.29	26	0.684		vs H ₂ O, EtOH, sl eth
1019 Hydrogen fluoride	HF	7664-39-3	20.006	col gas	-83.35	20	0.818 g/L		vs H ₂ O, EtOH, sl eth
1020 Hydrogen iodide	HI	10034-85-2	127.912	col or yel gas	-50.76	-35.55	5.228 g/L		vs H ₂ O; s os
1021 Hydrogen peroxide	H ₂ O ₂	7722-84-1	34.015	col liq	-0.43	150.2	1.44		vs H ₂ O
1022 Hydrogen selenide	H ₂ Se	7783-07-5	80.98	col gas; flam	-65.73	-41.25	3.310 g/L		s H ₂ O
1023 Hydrogen sulfide	H ₂ S	7783-06-4	34.082	col gas; flam	-85.5	-59.55	1.393 g/L		s H ₂ O
1024 Hydrogen disulfide	H ₂ S ₂	13465-07-1	66.148	col liq		70.7	1.334		
1025 Hydrogen telluride	H ₂ Te	7783-09-7	129.62	col gas	-49	-2	5.298 g/L		s H ₂ O, EtOH, alk
1026 Indium	In	7440-74-6	114.818	soil wh metal	156.60	2072	7.31		s acid
1027 Indium antimonide	InSb	1312-41-0	236.578	blk cub cry	525		5.7747		
1028 Indium arsenide	InAs	1303-11-3	189.740	gray cub cry	942		5.67		l acid
1029 Indium nitride	InN	25617-98-5	128.825	hex cry	1100		6.88		
1030 Indium phosphide	InP	22398-80-7	145.792	blk cub cry	1062		4.81		sl acid
1031 Indium(I) bromide	InBr	14280-53-6	194.722	oran-red orth cry	290	656	4.96		reac H ₂ O
1032 Indium(I) chloride	InCl	13465-10-6	150.271	yel cub cry	211	608	4.19		reac H ₂ O
1033 Indium(I) iodide	InI	13966-94-4	241.722	orth cry	364.4	712	5.32		
1034 Indium(II) bromide	InBr ₂	21264-43-7	274.626	orth cry			4.22		reac H ₂ O
1035 Indium(II) chloride	InCl ₂	13465-11-7	185.723	col orth cry	235		3.64		reac H ₂ O
1036 Indium(II) sulfide	InS	12030-14-7	146.884	red-brn orth cry	692		5.2		
1037 Indium(III) bromide	InBr ₃	13465-09-3	354.530	hyg yel-wh monocl cry	420		4.74	414 ^m	
1038 Indium(III) chloride	InCl ₃	10025-82-8	221.176	yel monocl cry; hyg	583		4.0	195.1 ^{2r}	s EtOH
1039 Indium(III) fluoride	InF ₃	7783-52-0	171.813	wh hex cry; hyg	1170	>1200	4.39		sl H ₂ O, s dil acid
1040 Indium(III) fluoride trihydrate	InF ₃ · 3H ₂ O	14166-78-0	225.859	wh cry	100 dec				s H ₂ O
1041 Indium(III) hydroxide	In(OH) ₃	20661-21-6	165.840	cub cry			4.4		

No.	Name	Formula	CAS Reg No.	Mol. weight	Physical form	mp/°C	bp/°C	Density g cm ⁻³	Solubility g/100 g H ₂ O	Qualitative solubility
1042	Indium(III) iodide	InI ₃	13510-35-5	495.531	yel-red monocl cry, hyg	207		4.69	1308 ²⁷	
1043	Indium(III) oxide	In ₂ O ₃	1312-43-2	277.634	yel cub cry	1912	200 dec	7.18		i H ₂ O; s hot acid
1044	Indium(III) perchlorate octahydrate	In(ClO ₄) ₃ · 8H ₂ O	13465-15-1	557.291	wh cry	-80				i H ₂ O
1045	Indium(III) phosphate	InPO ₄	14693-82-4	209.789	wh orth cry			4.9		
1046	Indium(III) selenide	In ₂ Se ₃	1312-42-1	466.52	blk hex cry	660		5.8		
1047	Indium(III) sulfate	In ₂ (SO ₄) ₃	13464-82-9	517.827	hyg wh powder			3.44	117 ²⁰	
1048	Indium(III) sulfide	In ₂ S ₃	12030-24-9	325.834	oran cub cry	1050		4.45		
1049	Indium(III) telluride	In ₂ Te ₃	1312-45-4	612.44	blk cub cry	667		5.75		
1050	Iodine	I ₂	7553-56-2	253.809	blue-blk plates	113.7	184.4	4.933	0.03 ²⁰	s bz, EtOH, eth, cdc, chl
1051	Iodic acid	HIO ₃	7782-68-5	175.910	col orth cry	110 dec		4.63	308 ²⁵	i EtOH, eth
1052	Periodic acid dihydrate	HIO ₄ · 2H ₂ O	10450-60-9	227.940	monocl hyg cry	122 dec		4.2		s H ₂ O, EtOH, sl eth
1053	Iodine tetroxide	I ₂ O ₄	12399-08-5	317.807	yel cry	85 dec		4.98	253.4 ¹⁸	sl H ₂ O
1054	Iodine pentoxide	I ₂ O ₅	12029-98-0	333.806	hyg wh cry	-300 dec				i EtOH, eth, CS ₂
1055	Iodine nonaoxide	I ₂ O ₉	73560-00-6	651.613	hyg yel powder	75 dec		4.3		s H ₂ O, EtOH, eth
1056	Iodine bromide	IBr	7789-33-5	206.808	blk orth cry	40	116 dec	3.24		react H ₂ O; s EtOH
1057	Iodine chloride	ICl	7790-99-0	162.357	red cry or oily liq	27.39	100 dec	3.2		react H ₂ O; s EtOH, bz
1058	Iodine trichloride	ICl ₃	865-44-1	233.262	yel tricr cry, hyg	101 tp (16 atm)	64 sp dec			
1059	Iodine fluoride	IF	13873-84-2	145.902	disproportionates at room temp					
1060	Iodine trifluoride	IF ₃	22520-96-3	183.899	yel solid, stable at low temp	-28 dec				
1061	Iodine pentafluoride	IF ₅	7783-66-6	221.896	yel liq	9.43	100.5	3.19		react H ₂ O
1062	Iodine heptafluoride	IF ₇	16921-96-3	259.893	col gas	6.5 tp	4.8 sp	10.62 g/L		s H ₂ O
1063	Iridium	Ir	7439-88-5	192.217	silv-wh metal, cub	2446	4428	22.56		s aqua regia
1064	Iridium(III) sulfide	Ir ₂ S ₃	12136-42-4	480.632	orth cry			10.2		
1065	Iridium(III) bromide	IrBr ₃	10049-24-8	431.929	red-brn monocl cry			6.82		i H ₂ O, acid, alk
1066	Iridium(III) bromide tetrahydrate	IrBr ₃ · 4H ₂ O	10049-24-8*	503.991	grn-brn cry					s H ₂ O; i EtOH
1067	Iridium(III) chloride	IrCl ₃	10025-83-9	298.575	brn monocl cry	763 dec		5.30		i H ₂ O, acid, alk
1068	Iridium(III) fluoride	IrF ₃	23370-59-4	249.212	blk hex cry	250 dec		-8.0		i H ₂ O, dil acid
1069	Iridium(III) iodide	IrI ₃	7790-41-2	572.930	dark brn monocl cry			-7.4		i H ₂ O, acid, bz, chl, s alk
1070	Iridium(III) oxide	Ir ₂ O ₃	1312-46-5	432.432	blue-blk cry	1000 dec				i H ₂ O; sl hot HCl
1071	Iridium(IV) chloride	IrCl ₄	10025-97-5	334.028	brn hyg solid	-700 dec				s H ₂ O, EtOH
1072	Iridium(IV) oxide	IrO ₂	12030-49-8	224.216	brn tetr cry	1100 dec		11.7		
1073	Iridium(IV) sulfide	IrS ₂	12030-51-2	256.349	orth cry			9.3		
1074	Iridium(VI) fluoride	IrF ₆	7783-75-7	306.207	yel cub cry, hyg	44	53.6	4.8		react H ₂ O
1075	Iron	Fe	7439-89-6	55.845	silv-wh or gray met	1538	2861	7.87		s dil acid
1076	Ferrocene	Fe(C ₅ H ₅) ₂	102-54-5	186.031	oran needles	172.5	249			i H ₂ O; s EtOH, eth, bz, dil HNO ₃
1077	Iron pentacarbonyl	Fe(CO) ₅	13463-40-6	195.896	yel oily liq, flamm	-20	103	1.490		i H ₂ O; s eth, bz, ace
1078	Iron nonacarbonyl	Fe ₃ (CO) ₉	15321-51-4	363.781	oran-yel cry	100 dec		2.85		
1079	Iron dodecacarbonyl	Fe ₃ (CO) ₁₂	12088-65-2	503.656	blk cry	140		2.00		
1080	Iron hydrocarbonyl	FeH(CO) ₅	17440-90-3	169.902	col liq, unstable	-70	dec			s alk
1081	Iron arsenide	FeAs	12044-16-5	130.767	gray orth cry	1030		7.85		
1082	Iron boride	FeB	12006-84-7	66.656	retr solid, orth	1650		-7		
1083	Iron boride	Fe ₂ B	12006-86-9	122.501	retr solid; tetr	1389		7.3		
1084	Iron carbide	Fe ₃ C	12011-67-5	179.546	gray cub cry	1227		7.694		
1085	Iron phosphide	FeP	26508-33-8	86.819	rhomb cry			6.07		
1086	Iron phosphide	Fe ₂ P	1310-43-6	142.664	gray hex needles	1370		6.8		i H ₂ O, dil acid, alk
1087	Iron phosphide	Fe ₃ P	12023-53-9	198.509	gray solid	1100		6.74		i H ₂ O
1088	Iron disulfide	FeS ₂	1317-66-4	119.977	blk cub cry	>600 dec		5.02		i H ₂ O
1089	Iron silicide	FeSi	12022-95-6	83.931	gray cub cry	1410		6.1		
1090	Iron silicide	FeSi ₂	12022-99-0	112.016	gray tetr cry	1220		4.74		
1091	Iron(II) aluminate	Fe(AlO ₂) ₂	12068-49-4	173.806	blk cub cry			4.3		
1092	Iron(II) arsenate	Fe ₃ (AsO ₄) ₂	10102-50-8	445.373	gin pow					i H ₂ O
1093	Iron(II) arsenate hexahydrate	Fe ₃ (AsO ₄) ₂ · 6H ₂ O	10102-50-8*	553.465	grn amorp pow	dec				i H ₂ O, s acid
1094	Iron(II) bromide	FeBr ₂	7789-46-0	215.653	yel-brn hex cry, hyg	691	dec	4.636	120 ²⁵	vs EtOH
1095	Iron(II) bromide hexahydrate	FeBr ₂ · 6H ₂ O	13463-12-2	323.744	grn hyg cry	27 dec		4.64	120 ²⁵	s EtOH
1096	Iron(II) carbonate	FeCO ₃	563-71-3	115.854	gray-brn hex cry			3.9	0.000062 ²⁰	

VAPOR PRESSURE

This table gives vapor pressure data for about 1800 inorganic and organic substances. In order to accommodate elements and compounds ranging from refractory to highly volatile in a single table, the temperature at which the vapor pressure reaches specified pressure values is listed. The pressure values run in decade steps from 1 Pa (about 7.5 $\mu\text{m Hg}$) to 100 kPa (about 750 mm Hg). All temperatures are given in $^{\circ}\text{C}$.

The data used in preparing the table came from a large number of sources; the main references used for each substance are indicated in the last column. Since the data were refit in most cases, values appearing in this table may not be identical with values in the source cited. The temperature entry in the 100 kPa column is close to, but not identical with, the normal boiling point (which is defined as the temperature at which the vapor pressure reaches 101.325 kPa). Although some temperatures are quoted to 0.1 $^{\circ}\text{C}$, uncertainties of several degrees should generally be assumed. Values followed by an "e" were obtained by extrapolating (usually with an Antoine equation) beyond the region for which experimental measurements were available and are thus subject to even greater uncertainty.

Compounds are listed by molecular formula following the Hill convention. Substances not containing carbon are listed first, followed by those that contain carbon. To locate an organic compound by name or CAS Registry Number when the molecular formula is not known, use the table "Physical Constants of Organic Compounds" in Section 3 and its indexes to determine the molecular formula. The indexes to "Physical Constants of Inorganic Compounds" in Section 4 can be used in a similar way.

More extensive and detailed vapor pressure data on selected important substances appear in other tables in this section of the *Handbook*. These substances are flagged by a symbol following the name as follows:

- * See "Vapor Pressure of Fluids below 300 K"
- ** See "IUPAC Recommended Data for Vapor Pressure Calibration"
- *** See "Vapor Pressure of Ice" and "Vapor Pressure of Water from 0 to 370 $^{\circ}\text{C}$ "

The following notations appear after individual temperature entries:

- s — Indicates the substance is a solid at this temperature.
- e — Indicates an extrapolation beyond the region where experimental measurements exist.
- i — Indicates the value was calculated from ideal gas thermodynamic functions, such as those in the *JANAF Thermochemical Tables* (see Reference 8).

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Vapor Pressure

Mol. form.	Name	Temperature in °C for the indicated pressure					Ref.	
		1 Pa	10 Pa	100 Pa	1 kPa	10 kPa		100 kPa
<i>Substances not containing carbon:</i>								
	Silver	1010	1140	1302	1509	1782	2160	2
Ag	Silver(I) bromide	569 i	656 i	765 i	905 i	1093 i	1359 i	9
AgBr	Silver(I) chloride	670	769	873	1052	1264	1561	4
AgCl	Silver(I) iodide	594	686	803	959	1177	1503	4
AgI	Aluminum	1209	1359	1544	1781	2091	2517	2
Al	Aluminum borohydride				-46.8	-9.4	45.5	4
AlB ₃ H ₁₂	Aluminum trichloride	58.4 s	76.5 s	97.1 s	120.7 s	148.2 s	180.5 s	4
AlCl ₃	Aluminum trifluoride	744 s	819 s	906 s	1008 s	1130 s	1276 s	8
AlF ₃	Aluminum triiodide				218	285	385	4
AlI ₃	Aluminum oxide			2122	2351	2629	2975	4
Al ₂ O ₃	Argon*		-226.4 s	-220.3 s	-212.4 s	-201.7 s	-186.0	1,5,31
Ar	Arsenic	280 s	323 s	373 s	433 s	508 s	601 s	3
As	Arsenic(III) chloride			-8 e	21.3	63.1	129.4	1
AsCl ₃	Arsenic(III) fluoride					8.1	56.0	4
AsF ₃	Arsenic(III) iodide				187	261	367 e	7
AsI ₃	Arsenic(III) oxide (arsenolite)	133.7 s	163.0 s	196.8 s	236.2 s	283.0		34
As ₂ O ₃	Astatine	88 s	119 s	156 s	202 s	258 s	334	2
At	Gold	1373	1541	1748	2008	2347	2805	2
Au	Boron	2075	2289	2549	2868	3272	3799	2
B	Boron tribromide			-45 e	-15 e	27.5	90.4	1
BBr ₃	Boron trichloride*			-94.0	-70.5	-37.4	12.3	4
BCl ₃	Boron trifluoride*	-173.9 s	-166.0 s	-156.0 s	-143.0 s	-125.9	-101.1	4
BF ₃	Tetrafluorodiborane						-34	1
B ₂ F ₄	Diborane			-162 e	-147.0	-125.8	-92.6	1
B ₂ H ₆	Pentaborane(9)				-34.8	3.8	57.6	4
B ₅ H ₉	Barium	638 s	765	912	1115	1413	1897	9
Ba	Beryllium	1189 s	1335	1518	1750	2054	2469	2
Be	Beryllium bromide	203 s	240 s	283 s	335 s	397 s	473 s	4
BeBr ₂	Beryllium chloride	196 s	237 s	284 s	339 s	402 s	487	4
BeCl ₂	Beryllium fluoride		686 e	767 e	869	999	1172 e	7
BeF ₂	Beryllium iodide	188 s	229 s	276 s	333 s	402 s	487	4
BeI ₂	Bismuth	668	768	892	1052	1265	1562	2
Bi	Bismuth tribromide			217 s	273 i	348 i	455 i	4.9
BiBr ₃	Bismuth trichloride				248.9	328.6	438.7	1.4
BiCl ₃	Cesium bromide	531 s	601 s	701 i	834 i	1019 i	1293 e	9
BrCs	Hydrogen bromide*		-153.3 s	-140.4 s	-123.8 s	-101.5 s	-67.0	5
BrH	Bromosilane				-81.0	-47.3	2.2	4
BrH ₃ Si	Ammonium bromide	121 s	154 s	195 s	246 s	310.4 s	395.1 s	5
BrH ₄ N	Potassium bromide	597 s	674 s	773				25
BrK	Lithium bromide		630	733	868	1049	1308	4
BrLi	Sodium bromide			791	931	1120	1389	4
BrNa	Rubidium bromide			766	903	1087	1350	4
BrRb	Thallium(I) bromide				509	635	817	4
BrTl	Bromine*	-87.7 s	-71.8 s	-52.7 s	-29.3 s	2.5	58.4	1
Br ₂	Cadmium bromide	373 s	435 s	509 s				27
Br ₂ Cd	Mercury(II) bromide	71 s	98 s	132 s	174 s	227 s	318	4
Br ₂ Hg	Thionyl bromide	-49 e	-29 e	-5 e	27.8	72.9	139.6	5
Br ₂ OS	Lead(II) bromide	374	431	502	597	726	914	4
Br ₂ Pb	Sulfur bromide	-7 e	15 e	42 e	78.4	128.1	200.9	5
Br ₂ S ₂	Indium(III) bromide			304.6 s	328.7 s	364.8 s		1
Br ₃ In	Phosphorus(V) oxybromide				64 e	115.5	191.4	5
Br ₃ OP	Phosphorus(III) bromide		-23 e	5 e	42.3	94.6	172.6	5
Br ₃ P	Antimony(III) bromide				136.5	196.9	286.5	1
Br ₃ Sb	Germanium(IV) bromide				51	105	188	4
Br ₄ Ge	Tin(IV) bromide				67	122	204	4
Br ₄ Sn	Zirconium(IV) bromide	136 s	167 s	203 s	245 s	295 s	356 s	4
Br ₄ Zr	Phosphorus(V) bromide		-19 s	4 s	31 s	65.5 s	110.1	5
Br ₅ P	Calcium	591 s	683 s	798 s	954	1170	1482	2
Ca	Cadmium	257 s	310 s	381	472	594	767	2
Cd								

Mol. form.	Name	Temperature in °C for the indicated pressure						Ref.
		1 Pa	10 Pa	100 Pa	1 kPa	10 kPa	100 kPa	
Eu	Europium	590 s	684 s	799 s	961	1179	1523	14
FH	Hydrogen fluoride*				-71.1	-33.7	19.2	1,5
FHO ₃ S	Fluorosulfonic acid	-14 e	4 e	28 e	59.1	101.3	162.2	5
FK	Potassium fluoride			869	1017	1216	1499	4
FLi	Lithium fluoride	801 s	896	1024	1188	1395	1672	4,12,25
FNO	Nitrosyl fluoride			-131 e	-116.1	-94.3	-60.1	5
FNO ₂	Nitryl fluoride		-156 e	-144 e	-128.1	-106.0	-72.6	5
FNO ₃	Fluorine nitrate	-160 e	-149 e	-135 e	-115.1	-87.4	-45.0	5
FNa	Sodium fluoride		920 s	1058	1218	1426	1702	4,12,24
FRb	Rubidium fluoride			910	1001	1145	1409	4,12
F ₂	Fluorine*	-235 s	-229.5 s	-222.9 s	-214.8	-204.3	-188.3	1,5
F ₂ O	Fluorine monoxide*	-211.7	-204.7	-195.9	-184.2	-168.2	-144.9	5
F ₂ OS	Thionyl fluoride			-124 e	-106.5	-81.5	-44.1	5
F ₂ O ₂ Re	Rhenium(VI) dioxydifluoride				89.2	131.9	185 e	26
F ₂ Pb	Lead(II) fluoride				865	1054	1292	4
F ₂ Xe	Xenon difluoride			2.9 s	31.8 s	67.9 s	114 s	1,5
F ₂ Zn	Zinc fluoride	731 s	813 s	911 i	1048 i	1237 i	1503 i	9
F ₃ N	Nitrogen trifluoride*	-201 e	-194 e	-185 e	-172.8	-155.5	-129.2	5
F ₃ OP	Phosphorus(V) oxyfluoride	-124 s	-113 s	-100 s	-83.7 s	-64.1 s	-39.7 s	5
F ₃ P	Phosphorus(III) fluoride*				-152 e	-132.6	-101.4	5
F ₄ MoO	Molybdenum(VI) oxytetrafluoride	-21 s	3 s	33 s	69.3 s	117.3	184.1	26
F ₄ ORe	Rhenium(VI) oxytetrafluoride	5 s	26 s	50.7 s	80.1 s	117.1	171.2	26
F ₄ OW	Tungsten(VI) oxytetrafluoride	2 s	25 s	52.1 s	84.3 s	126.7	185.4	26
F ₄ S	Sulfur tetrafluoride				-110.0	-82.1	-40.3	5
F ₄ Se	Selenium tetrafluoride				13.6	51.6	104.7	5
F ₄ Si	Tetrafluorosilane*	-166 s	-157 s	-145.6 s	-132.3 s	-115.7 s	-94.9 s	4,7
F ₅ Mo	Molybdenum(V) fluoride				86.6	140.3	213 e	26
F ₅ Nb	Niobium(V) fluoride				80	140	224	4
F ₅ ORe	Rhenium(VII) oxypentafluoride	-103 s	-84 s	-59 s	-28 s	13.7 s	72.8	26
F ₅ Os	Osmium(V) fluoride			74.1	113.2	162.3	226 e	26
F ₅ P	Phosphorus(V) fluoride	-157 s	-148 s	-137 s	-124.5 s	-108.6 s	-84.8	5
F ₅ Re	Rhenium(V) fluoride			58.8	99.5	152 e	221 e	26
F ₅ Ta	Tantalum(V) fluoride					119	229	4
F ₆ Ir	Iridium(VI) fluoride	-88 s	-71 s	-51 s	-27 s	3.8 s	53.1	26
F ₆ Mo	Molybdenum(VI) fluoride	-98 s	-82 s	-64 s	-41.2 s	-13.4 s	33.5	26
F ₆ Os	Osmium(VI) fluoride	-89 s	-73 s	-54 s	-30.6 s	-1.7 s	47.4	26
F ₆ Re	Rhenium(VI) fluoride	-97 s	-82 s	-63 s	-40.2 s	-11.9 s	33.4	26
F ₆ S	Sulfur hexafluoride*	-158 s	-147 s	-133.6 s	-116.6 s	-94.4 s	-64.1 s	5
F ₆ Se	Selenium hexafluoride	-143 s	-132 s	-118 s	-100.7 s	-77.8 s	-46.5 s	5
F ₆ Te	Tellurium hexafluoride	-142 s	-130 s	-115 s	-96 s	-71.8 s	-39.1 s	5
F ₆ W	Tungsten(VI) fluoride	-107 s	-92 s	-74 s	-52.1 s	-24.8 s	16.9	26
F ₁₀ S ₂	Sulfur decafluoride					-22.0	28.5	5
Fe	Iron	1455 s	1617	1818	2073	2406	2859	2
Fr	Francium	131 e	181 e	246 e	335 e	465 e	673 e	2
Ga	Gallium	1037	1175	1347	1565	1852	2245	2
Gd	Gadolinium	1563 i	1755 i	1994 i	2300 i	2703 i	3262 i	3
Ge	Germanium	1371	1541	1750	2014	2360	2831	2
HI	Hydrogen iodide*	-146 s	-135.2 s	-120.8 s	-101.9 s	-75.9 s	-35.9	5
HKO	Potassium hydroxide	520 e	601 e	704	842	1035	1325	4
HNO ₃	Nitric acid			-37 e	-9 e	28.4	82.2	5
HN ₃	Hydrazoic acid			-79 e	-54 e	-18.0	35.7	5
HNaO	Sodium hydroxide	513	605	722	874	1080	1377	4
H ₂	Hydrogen*					-258.6	-252.8	1
H ₂ L ₂ Si	Diiodosilane				11.8	70.5	149.4	4
H ₂ O	Water***	-60.7 s	-42.2 s	-20.3 s	7.0	45.8	99.6	36,37
H ₂ O ₂	Hydrogen peroxide			13 e	45 e	89.0	149.8	5
H ₂ O ₃ S	Sulfuric acid	72	103	140	187	248	330	4
H ₂ S	Hydrogen sulfide*		-149 s	-136 s	-118.9 s	-95.9 s	-60.5	1,5
H ₂ S ₂	Hydrogen disulfide				-27 e	12.2	70.7	5

Mol. form.	Name	Temperature in °C for the indicated pressure					Ref.	
		1 Pa	10 Pa	100 Pa	1 kPa	100 kPa		
H ₂ Se	Hydrogen selenide	-145 s	-134 s	-120 s	-102.8 s	-78.9 s	-41.5	5
H ₂ Te	Hydrogen telluride				-47.7	-10.1	45.2	5
H ₃ ISi	Iodosilane				-94.5 s	-71.3	-33.6	4
H ₃ N	Ammonia*	-139 s	-127 s	-112 s	43.7	73.3	109.8	1,5,6
H ₃ NO	Hydroxylamine				-145 s	-122.7	-88.0	4
H ₃ P	Phosphine*	-182 s	-173 s	-161 s	253 s	318.4 s	405.2 s	5
H ₄ IN	Ammonium iodide	125 s	159 s	201 s	14.7	55.6	113 e	5
H ₄ N ₂	Hydrazine				-165.4	-143.7	-111.8	4
H ₄ Si	Silane*					-270.6	-268.9	2
He	Helium*							
Hf	Hafnium	2416	2681	3004	3406	3921	4603	9
Hg	Mercury**	42.0	76.6	120.0	175.6	250.3	355.9	29,30
HgI ₂	Mercury(II) iodide	85.1 s	115.6 s	152.4 s	197.8 s	255.1 s	353.6	4
Ho	Holmium	1159 s	1311 s	1502 i	1767 i	2137 i	2691 i	3
IK	Potassium iodide			731	866	1052	1322	4
ILi	Lithium iodide	545	619	710	824	972	1170	4
INa	Sodium iodide			753	883	1058	1301	4
IRb	Rubidium iodide			733	866	1045	1302	4
ITl	Thallium(I) iodide				520	644	821	4
I ₂	Iodine (rhombic)	-12.8 s	9.3 s	35.9 s	68.7 s	108 s	184.0	1,2
I ₂ Pb	Lead(II) iodide			470	558	682	869	4
I ₂ Zn	Zinc iodide	301 s	351 s	409 s	488 i	598 i	750 i	9
I ₃ Sb	Antimony(III) iodide				214.9	292.0	401.2	4
I ₄ Sn	Tin(IV) iodide				167.1	242.7	347.7	4
I ₄ Zr	Zirconium(IV) iodide	187 s	220 s	259 s	305 s	361 s	430 s	4
In	Indium	923	1052	1212	1417	1689	2067	2
Ir	Iridium	2440 s	2684	2979	3341	3796	4386	2
K	Potassium	200.2	256.5	328	424	559	756.2	13,30
Kr	Krypton*	-214.0 s	-208.0 s	-199.4 s	-188.9 s	-174.6 s	-153.6	5
La	Lanthanum	1732 i	1935 i	2185 i	2499 i	2905 i	3453 i	3
Li	Lithium	524.3	612.3	722.1	871.2	1064.3	1337.1	13,30
Lu	Lutetium	1633 s	1829.8	2072.8	2380 i	2799 i	3390 i	3
Mg	Magnesium	428 s	500 s	588 s	698	859	1088	2
Mn	Manganese	955 s	1074 s	1220 s	1418	1682	2060	2
Mo	Molybdenum	2469 s	2721	3039	3434	3939	4606	2
MoO ₃	Molybdenum(VI) oxide				801	935	1151	4
NO	Nitric oxide*	-201 s	-195 s	-188 s	-179.3 s	-168.1 s	-151.9	5
N ₂	Nitrogen*	-236 s	-232 s	-226.8 s	-220.2 s	-211.1 s	-195.9	1,5
N ₂ O	Nitrous oxide*	-167 s	-157 s	-145.4 s	-131.1 s	-112.9 s	-88.7	5
N ₂ O ₄	Nitrogen tetroxide	-92 s	-78 s	-61 s	-41.1 s	-16.6 s	28.7	5
N ₂ O ₅	Nitrogen pentoxide	-71 s	-56 s	-40 s	-19.9 s	3.9 s	33.2	5
Na	Sodium	280.6	344.2	424.3	529	673	880.2	13,30
Nb	Niobium	2669	2934	3251	3637	4120	4740	2
Nd	Neodymium	1322.3	1501.2	1725.3	2023 i	2442 i	3063 i	3
Ne	Neon*	-261 s	-260 s	-258 s	-255 s	-252 s	-246.1	2
Ni	Nickel	1510	1677	1881	2137	2468	2911	2
OPb	Lead(II) oxide	724	816	928	1065	1241	1471	4
OSr	Strontium oxide	1789 s	1903 s	2047 s	2235 s	2488 s		4
O ₂	Oxygen*				-211.9	-200.5	-183.1	1,28
O ₂ S	Sulfur dioxide*			-98 s	-80 s	-52.2	-10.3	1,5
O ₂ Se	Selenium dioxide	124.5 s	153.9 s	188 s	228 s	275 s	315 s	38
O ₂ Si	Silicon dioxide	1966 i	2149 i	2368 i				8
O ₃	Ozone*	-189 e	-182 e	-172 e	-158 e	-139.7	-111.5	5
O ₃ P ₂	Phosphorus(III) oxide				47.3	100.3	172.8	4
O ₃ S	Sulfur trioxide				-20 s	6.6 s	44.5	5
O ₃ Sb ₂	Antimony(III) oxide (valentinite)	426.1 s	478 s	539 s	610 s	907	1420	4,35
O ₃ P ₂	Phosphorus(V) oxide	285 s	328 s	377.5 s	434.4 s	500.5 s	591	4
O ₇ Re ₂	Rhenium(VII) oxide	147 s	176 s	208 s	244 s	284 s	362	4
Os	Osmium	2887 s	3150	3478	3875	4365	4983	2

VAPOR PRESSURE OF FLUIDS AT TEMPERATURES BELOW 300 K

This table gives vapor pressures of 67 important fluids in the temperature range 2 to 300 K. Helium (⁴He), hydrogen (H₂), and neon (Ne) are covered on this page. The remaining fluids are listed on subsequent pages by molecular formula in the Hill order (see Introduction). The data have been taken from evaluated sources; references are listed at the end of the table.

Pressures are given in kilopascals (kPa). Note that:

1 kPa = 7.50062 Torr

100 kPa = 1 bar

101.325 kPa = 1 atm

"s" following an entry indicates that the compound is solid at that temperature.

Helium		Hydrogen		Neon	
T/K	P/kPa	T/K	P/kPa	T/K	P/kPa
2.2	5.3	14.0	7.90	25.0	51.3
2.3	6.7	14.5	10.38	26.0	71.8
2.4	8.3	15.0	13.43	27.0	98.5
2.5	10.2	15.5	17.12	28.0	132.1
2.6	12.4	16.0	21.53	29.0	173.5
2.7	14.8	16.5	26.74	30.0	223.8
2.8	17.5	17.0	32.84	31.0	284.0
2.9	20.6	17.5	39.92	32.0	355.2
3.0	24.0	18.0	48.08	33.0	438.6
3.1	27.8	18.5	57.39	34.0	535.2
3.2	32.0	19.0	67.96	35.0	646.2
3.3	36.5	19.5	79.89	36.0	772.8
3.4	41.5	20.0	93.26	37.0	916.4
3.5	47.0	20.5	108.2	38.0	1078
3.6	52.9	21.0	124.7	39.0	1260
3.7	59.3	21.5	143.1	40.0	1462
3.8	66.1	22.0	163.2	41.0	1688
3.9	73.5	22.5	185.3	42.0	1939
4.0	81.5	23.0	209.4	43.0	2216
4.1	90.0	23.5	235.7	44.0	2522

Helium		Hydrogen		Neon	
T/K	P/kPa	T/K	P/kPa	T/K	P/kPa
4.2	99.0	24.0	264.2		
4.3	108.7	24.5	295.1		
4.4	119.0	25.0	328.5		
4.5	129.9	25.5	364.3		
4.6	141.6	26.0	402.9		
4.7	153.9	26.5	444.3		
4.8	167.0	27.0	488.5		
4.9	180.8	27.5	535.7		
5.0	195.4	28.0	586.1		
5.1	210.9	28.5	639.7		
		29.0	696.7		
		29.5	757.3		
		30.0	821.4		
		30.5	889.5		
		31.0	961.5		
		31.5	1038.0		
		32.0	1119.0		
		32.5	1204.0		
Ref.	17,18		1		13

T/K	Ar Argon	BCl ₃ Boron trichloride	BF ₃ Boron trifluoride	BrH Hydrogen bromide	Br ₂ Bromine	ClF Chlorine fluoride	ClH Hydrogen chloride
50	0.1 s						
55	0.2 s						
60	0.8 s						
65	2.8 s						
70	7.7 s						
75	18.7 s						
80	40.7 s						
85	79.0						
90	134						
95	213						
100	324						
105	473						
110	666						
115	910					0.1	
120	1214					0.3	0.1 s
125	1584					0.6	0.3 s
130	2027					1.2	0.5 s
135	2553			0.1 s		2.1	1.0 s
140	3170			0.3 s		3.6	1.9 s
145	3892		7.7	0.6 s		6.0	3.4 s
150	4736		13.4	1.1 s		9.5	5.8 s
155			22.3	1.9 s		14.6	9.5 s
160			35.2	3.3 s		21.8	14.7
165			53.7	5.4 s		31.7	22.0
170			79.1	8.7 s		44.8	31.9
175			113	13.4 s		62.0	45.1

T/K	Ar Argon	BCl ₃ Boron trichloride	BF ₃ Boron trifluoride	BrH Hydrogen bromide	Br ₂ Bromine	ClF Chlorine fluoride	ClH Hydrogen chloride
180		0.1	157	20.1 s		84.2	62.5
185		0.2	214	29.5 s		112	84.7
190		0.3	285	37.9		147	113
195		0.5	372	51.8		190	148
200		0.8	479	69.5		242	190
205		1.2	608	91.8		304	242
210		1.8	762	119		378	304
215		2.6	944	153		464	377
220		3.8	1160	194	0.1 s	564	463
225		5.2	1413	242	0.2 s	680	563
230		7.2	1709	299	0.3 s	812	678
235		9.7	2056	366	0.4 s	961	811
240		12.9	2460	443	0.7 s	1130	961
245		17.0	2913	532	1.1 s	1319	1132
250		22.0	3481	633	1.7 s	1529	1325
255		28.1	4123	748	2.6 s	1762	1542
260		35.6	4874	878	3.8 s	2019	1784
265		44.5		1023	5.5 s	2301	2054
270		55.1		1185	7.3	2608	2354
275		67.6		1364	9.5	2941	2686
280		82.2		1562	12.3	3303	3053
285		99.1		1780	15.6	3693	3457
290		119		2018	19.7	4111	3901
295		141		2278	24.6	4560	4388
300		166		2561	30.5	5039	4921
Ref.	8,15	12	12	12	12	12	12

T/K	ClO ₂ Chlorine dioxide	Cl ₂ Chlorine	Cl ₄ Si Silicon tetrachloride	FH Hydrogen fluoride	F ₂ Fluorine	F ₂ O Difluorine oxide	F ₃ N Nitrogen trifluoride
50							
55					0.4		
60					1.5		
65					4.8		
70					12.3		
75					27.6	0.1	
80					55.3	0.2	
85					101	0.5	0.1
90					172	1.2	0.2
95					276	2.6	0.4
100					420	5.3	0.9
105					615	10.1	2.0
110					870	18.0	4.0
115					1196	30.5	7.3
120					1605	49.3	12.8
125					2108	76.7	21.1
130					2721	115	33.5
135					3458	168	51.1
140					4339	237	75.4
145						328	108
150						444	150
155						588	205
160						766	273
165						981	357
170						1238	459
175		1.8				1541	581
180		2.8				1895	726
185		4.2				2303	896
190		6.1		0.3		2771	1092
195	0.1	8.7		0.5		3302	1319
200	0.3	12.3		0.8		3899	1578
205	0.5	16.9		1.2		4567	1871
210	0.9	22.9	0.1	1.7		5308	2203

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T/K	ClO ₂ Chlorine dioxide	Cl ₂ Chlorine	Cl ₄ Si Silicon tetrachloride	FH Hydrogen fluoride	F ₂ Fluorine	F ₂ O Difluorine oxide	F ₃ N Nitrogen trifluoride
215	1.4	30.5	0.2	2.3			2577
220	2.3	40.1	0.3	3.2			2995
225	3.5	51.9	0.5	4.4			3464
230	5.3	66.4	0.7	5.9			3991
235	7.6	84.0	1.0	7.9			
240	10.8	105	1.5	10.3			
245	14.9	130	2.0	13.4			
250	20.1	160	2.8	17.2			
255	26.6	194	3.8	21.8			
260	34.6	234	5.0	27.4			
265	44.4	280	6.6	34.2			
270	56.1	332	8.6	42.2			
275	69.9	392	11.1	51.8			
280	86.2	459	14.2	63.1			
285	105	535	17.9	76.3			
290	127	619	22.3	91.7			
295	151	714	27.7	110			
300	179	818	34.0	130			
Ref.	12	5	12	12	12	12	1

T/K	F ₃ P Phosphorus trifluoride	F ₄ Si Silicon tetrafluoride	F ₆ S Sulfur hexafluoride	HI Hydrogen iodide	H ₂ S Hydrogen sulfide	H ₃ N Ammonia	H ₃ P Phosphine
105	0.1						0.1
110	0.2						0.2
115	0.5						0.4
120	1.0						0.7
125	1.9	0.1 s					1.3
130	3.5	0.2 s					2.3
135	5.9	0.4 s			0.1 s		3.9
140	9.5	0.9 s	0.1 s		0.2 s		6.2
145	14.9	1.9 s	0.2 s		0.3 s		9.6
150	22.5	3.8 s	0.4 s		0.6 s		14.5
155	33.1	7.5 s	0.8 s	0.1 s	1.1 s		21.1
160	47.3	14.0 s	1.5 s	0.2 s	1.9 s	0.1 s	30.0
165	66.0	25.2 s	2.6 s	0.4 s	3.2 s	0.2 s	41.6
170	90.1	43.8 s	4.4 s	0.8 s	5.2 s	0.3 s	56.6
175	121	74.2 s	7.1 s	1.3 s	8.3 s	0.6 s	75.6
180	159	122 s	11.3 s	2.2 s	12.7 s	1.2 s	99.2
185	206	197 s	17.3 s	3.4 s	18.9 s	2.1 s	128
190	262	280	25.9 s	5.3 s	26.6	3.5 s	163
195	330	376	38.0 s	8.0 s	36.7	5.8 s	205
200	410	488	54.4 s	11.7 s	49.8	8.7	254
205	503	618	76.6 s	16.8 s	66.4	12.6	312
210	611	766	106 s	23.6 s	87.1	17.9	379
215	736	932	145 s	32.5 s	113	24.9	456
220	877	1117	195 s	44.0 s	144	34.1	544
225	1037	1324	249	56.2	182	45.9	644
230	1217	1555	305	71.4	227	60.8	756
235	1418	1816	371	89.7	281	79.6	881
240	1640	2111	448	112	344	103	1019
245	1885	2449	536	137	416	131	1172
250	2154	2841	636	168	500	165	1341
255	2448	3301	750	203	597	207	1525
260	2767		878	244	706	256	1725
265	3112		1021	290	830	313	1942
270			1181	343	969	381	2176
275			1358	404	1124	460	2428
280			1554	472	1297	552	2699
285			1768	548	1488	655	2987
290			2003	633	1698	774	3295
295			2258	727	1929	909	3621
300			2534	831	2181	1062	3621
Ref.	12	12	12,15	12	12,1	1062	3621