

# Hydrogen chloride

<b>Other names:</b>	Acide chlorhydrique Acido cloridrico Anhydrous hydrochloric acid Anhydrous hydrogen chloride BASILIN CHLOROHYDRIC ACID Chloorwaterstof Chlorowodor Chlorwasserstoff HCl HYDROCHLORIC ACID Hydrochloric acid gas Hydrochloric acid, anhydrous Hydrochloric acid Hydrochloride Hydrogen chloride (HCl) Hydrogen chloride (acid) Hydrogen-chloride-anhydrous- Marine acid Muriatic acid NA 1789 NSC 77365 Salzsaeure Soldering acid Spirit of salt Spirits of salt Spirits of salts UN 1050 UN 1789 UN 2186
<b>Inchi:</b>	InChI=1S/ClH/h1H
<b>InchiKey:</b>	VEXZGXHMUGYJMC-UHFFFAOYSA-N
<b>Formula:</b>	ClH
<b>SMILES:</b>	Cl
<b>Mol. weight [g/mol]:</b>	36.46
<b>CAS:</b>	7647-01-0

# Physical Properties

Property code	Value	Unit	Source
af	0.1330		KDB
affp	556.90	kJ/mol	NIST Webbook
basg	530.10	kJ/mol	NIST Webbook
dm	1.10	debye	KDB
gf	95.30	kJ/mol	KDB
gyrad	0.2990		KDB
hf	-92.36	kJ/mol	KDB
hf	-92.31 ± 0.10	kJ/mol	NIST Webbook
hfus	1.64	kJ/mol	Joback Method
hvap	19.83	kJ/mol	Joback Method
ie	12.75	eV	NIST Webbook
ie	12.75 ± 0.00	eV	NIST Webbook
ie	12.75 ± 0.01	eV	NIST Webbook
ie	12.72 ± 0.03	eV	NIST Webbook
ie	12.75	eV	NIST Webbook
ie	12.75 ± 0.01	eV	NIST Webbook
ie	12.74 ± 0.01	eV	NIST Webbook
ie	12.74 ± 0.01	eV	NIST Webbook
ie	12.74 ± 0.01	eV	NIST Webbook
ie	12.79	eV	NIST Webbook
ie	12.74 ± 0.01	eV	NIST Webbook
ie	12.75	eV	NIST Webbook
log10ws	-0.16		Crippen Method
logp	0.422		Crippen Method
mcvol	23.100	ml/mol	McGowan Method
pc	8310.00	kPa	KDB
pc	8256.00 ± 8.24	kPa	NIST Webbook
pt	13.80 ± 0.01	kPa	NIST Webbook
sgb	186.90 ± 0.01	J/molxK	NIST Webbook
tb	188.00	K	KDB
tc	324.70	K	KDB
tc	324.68 ± 0.03	K	NIST Webbook
tf	158.97	K	KDB
tf	161.15 ± 2.00	K	NIST Webbook
tt	158.80	K	KDB
vc	0.081	m <sup>3</sup> /kmol	KDB
zc	0.2493260		KDB
zra	0.27		KDB

# Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	12.24	J/molxK	236.13	Joback Method
cpg	13.10	J/molxK	263.03	Joback Method
cpg	13.78	J/molxK	289.92	Joback Method
cpg	14.30	J/molxK	316.82	Joback Method
cpg	14.67	J/molxK	343.72	Joback Method
cpg	14.90	J/molxK	370.61	Joback Method
cpg	15.02	J/molxK	397.51	Joback Method
dvisc	0.0000994	Paxs	136.05	Joback Method
dvisc	0.0000972	Paxs	152.73	Joback Method
dvisc	0.0000955	Paxs	169.41	Joback Method
dvisc	0.0000941	Paxs	186.09	Joback Method
dvisc	0.0000929	Paxs	202.77	Joback Method
dvisc	0.0000920	Paxs	219.45	Joback Method
dvisc	0.0000912	Paxs	236.13	Joback Method
hsubt	19.60	kJ/mol	142.00	NIST Webbook
hsubt	19.70	kJ/mol	127.00	NIST Webbook
hvapt	16.20	kJ/mol	188.00	NIST Webbook
rhoI	1193.00	kg/m <sup>3</sup>	188.00	KDB
speedsl	676.00	m/s	268.00	Speed of Sound Measurements and a Fundamental Equation of State for Hydrogen Chloride
speedsl	762.00	m/s	252.90	Speed of Sound Measurements and a Fundamental Equation of State for Hydrogen Chloride
speedsl	790.00	m/s	248.00	Speed of Sound Measurements and a Fundamental Equation of State for Hydrogen Chloride

speedsl	814.00	m/s	243.00	Speed of Sound Measurements and a Fundamental Equation of State for Hydrogen Chloride
speedsl	865.00	m/s	233.10	Speed of Sound Measurements and a Fundamental Equation of State for Hydrogen Chloride
speedsl	887.00	m/s	229.20	Speed of Sound Measurements and a Fundamental Equation of State for Hydrogen Chloride
speedsl	910.00	m/s	224.30	Speed of Sound Measurements and a Fundamental Equation of State for Hydrogen Chloride
speedsl	940.00	m/s	218.30	Speed of Sound Measurements and a Fundamental Equation of State for Hydrogen Chloride
speedsl	734.00	m/s	258.00	Speed of Sound Measurements and a Fundamental Equation of State for Hydrogen Chloride
speedsl	705.00	m/s	263.00	Speed of Sound Measurements and a Fundamental Equation of State for Hydrogen Chloride
speedsl	646.00	m/s	273.00	Speed of Sound Measurements and a Fundamental Equation of State for Hydrogen Chloride

# Correlations

Information	Value
Property code	pvap
Equation	$\ln(P_{\text{vp}}) = A + B/(T + C)$
Coeff. A	1.46857e+01
Coeff. B	-1.76110e+03
Coeff. C	-1.32200e+01
Temperature range (K), min.	158.97
Temperature range (K), max.	324.65

## Sources

Thermochemical study of dichloromethylpyrimidine isomers: Experimental thermochemical study of 4,5-dichloro-2-nitroaniline: A calorimetric and computational study of the thermochemistry of halogenated derivatives of the temperature dependence of Titanium(IV) hydrolysis and complexation of Potassium Strontium Ultraborate Dehydrated: Electrical Conductivity of Electrolytes Found In Natural Waters from (5 to 90) Degree equilibria of the systems of CsCl + ErCl<sub>3</sub> + H<sub>2</sub>O and CsCl + ErCl<sub>3</sub> + HCl Solubility of silicon in aqueous hydrochloric acid solution enthalpies of formation of solid phase compounds: aqueous solubility of Phase Diagram of AICl<sub>3</sub>-FeCl<sub>3</sub>-H<sub>2</sub>O(-HCl) Salt Water System at 298.15 K and Its Application in the Crystallization of AICl<sub>3</sub>\*6H<sub>2</sub>O: Crippen Method: https://www.doi.org/10.1016/j.jct.2016.04.011 https://www.doi.org/10.1016/j.jct.2009.05.013 https://www.doi.org/10.1016/j.jct.2010.06.012 https://www.doi.org/10.1016/j.jct.2018.11.001 https://www.doi.org/10.1016/j.tca.2007.08.004 https://www.doi.org/10.1021/je101012n https://www.doi.org/10.1016/j.jct.2013.09.016 https://www.doi.org/10.1016/j.fluid.2007.03.009 https://www.doi.org/10.1016/j.tca.2016.08.010 https://www.doi.org/10.1021/acs.jced.9b00238 https://en.wikipedia.org/wiki/Joback\_method http://pubs.acs.org/doi/abs/10.1021/ci9903071 https://www.doi.org/10.1016/j.tca.2004.11.004 https://www.thermo.com/research/kdb/hcprop/showprop.php?cmpid=1905

Enthalpies of formation and lattice enthalpies of alkaline metal acetates: KDB: https://www.doi.org/10.1016/j.jct.2007.04.009 https://www.doi.org/10.1016/j.jct.2011.10.020 https://www.doi.org/10.1016/j.jct.2006.04.010 https://www.doi.org/10.1016/j.jct.2005.03.008 https://www.doi.org/10.1016/j.jct.2013.07.026 https://www.doi.org/10.1016/j.tca.2007.03.007 https://www.doi.org/10.1016/j.jct.2009.04.012 https://www.doi.org/10.1021/acs.jced.7b00107 https://www.doi.org/10.1016/j.jct.2007.07.007 https://www.doi.org/10.1016/j.jct.2012.08.028 https://www.doi.org/10.1016/j.tca.2004.04.027

Volumetric properties of ascorbic acid (vitamin C) and thiamine hydrochloride Experimental thermochemical study of aqueous NaCl and bromine derivatives vapor pressure and excess Gibbs free energy of the ternary system {x1CH<sub>3</sub>F + x2HCl + x3NaCl} at temperature of 298.15 K and 303.15, 308.15, and 313.15 K: https://www.doi.org/10.1016/j.jct.2013.07.026 https://www.doi.org/10.1016/j.tca.2007.03.007 https://www.doi.org/10.1016/j.jct.2009.04.012 https://www.doi.org/10.1021/acs.jced.7b00107 https://www.doi.org/10.1016/j.jct.2007.07.007 https://www.doi.org/10.1016/j.jct.2012.08.028 https://www.doi.org/10.1016/j.tca.2004.04.027

Thermochemical study of 2,6-dichloro-4-nitroaniline and 2,4-dichloro-6-nitroaniline: K<sub>2</sub>Sr[B<sub>4</sub>O<sub>5</sub>(OH)<sub>4</sub>]\*10H<sub>2</sub>O: Experimental thermochemical study of 2,5- and 2,6-dichloro-4-nitroanilines: Thermodynamics of the Antiviral and Antiparkinsonian Drug Amantadine Hydrochloride: Condensed State Thermodynamic Thermochemistry of Isomers of Chloro- and Nitroanilines: Thermochemical studies of benzoxazole derivatives: borates: https://www.doi.org/10.1016/j.jct.2016.04.011 https://www.doi.org/10.1016/j.jct.2009.05.013 https://www.doi.org/10.1016/j.jct.2010.06.012 https://www.doi.org/10.1016/j.jct.2018.11.001 https://www.doi.org/10.1016/j.tca.2007.08.004 https://www.doi.org/10.1021/je101012n https://www.doi.org/10.1016/j.jct.2013.09.016 https://www.doi.org/10.1016/j.fluid.2007.03.009 https://www.doi.org/10.1016/j.tca.2016.08.010 https://www.doi.org/10.1021/acs.jced.9b00238 https://en.wikipedia.org/wiki/Joback\_method http://pubs.acs.org/doi/abs/10.1021/ci9903071 https://www.doi.org/10.1016/j.tca.2004.11.004 https://www.thermo.com/research/kdb/hcprop/showprop.php?cmpid=1905 https://www.doi.org/10.1016/j.jct.2007.04.009 https://www.doi.org/10.1016/j.jct.2011.10.020 https://www.doi.org/10.1016/j.jct.2006.04.010 https://www.doi.org/10.1016/j.jct.2005.03.008 https://www.doi.org/10.1016/j.jct.2013.07.026 https://www.doi.org/10.1016/j.tca.2007.03.007 https://www.doi.org/10.1016/j.jct.2009.04.012 https://www.doi.org/10.1021/acs.jced.7b00107 https://www.doi.org/10.1016/j.jct.2007.07.007 https://www.doi.org/10.1016/j.jct.2012.08.028 https://www.doi.org/10.1016/j.tca.2004.04.027



<b>dvisc:</b>	Dynamic viscosity
<b>gf:</b>	Standard Gibbs free energy of formation
<b>gyrad:</b>	Radius of Gyration
<b>hf:</b>	Enthalpy of formation at standard conditions
<b>hfus:</b>	Enthalpy of fusion at standard conditions
<b>hsubt:</b>	Enthalpy of sublimation at a given temperature
<b>hvap:</b>	Enthalpy of vaporization at standard conditions
<b>hvapt:</b>	Enthalpy of vaporization at a given temperature
<b>ie:</b>	Ionization energy
<b>log10ws:</b>	Log10 of Water solubility in mol/l
<b>logp:</b>	Octanol/Water partition coefficient
<b>mcvol:</b>	McGowan's characteristic volume
<b>pc:</b>	Critical Pressure
<b>pt:</b>	Triple Point Pressure
<b>pvap:</b>	Vapor pressure
<b>rho:</b>	Liquid Density
<b>sgb:</b>	Molar entropy at standard conditions (1 bar)
<b>speedsl:</b>	Speed of sound in fluid
<b>tb:</b>	Normal Boiling Point Temperature
<b>tc:</b>	Critical Temperature
<b>tf:</b>	Normal melting (fusion) point
<b>tt:</b>	Triple Point Temperature
<b>vc:</b>	Critical Volume
<b>zc:</b>	Critical Compressibility
<b>zra:</b>	Rackett Parameter

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