

Cyclopentasiloxane, decamethyl-

Other names:	CD3770 D3770 D5 (decamethylcyclopentasiloxane) Decamethylcyclopentasiloxane Decamethylcylopentasiloxane Dekamethylcyklopentasiloxan Dimethylsiloxane pentamer
Inchi:	InChI=1S/C10H30O5Si5/c1-16(2)11-17(3,4)13-19(7,8)15-20(9,10)14-18(5,6)12-16/h1-10
InchiKey:	XMSXQFUHVVRWGNA-UHFFFAOYSA-N
Formula:	C10H30O5Si5
SMILES:	C[Si]1(C)O[Si](C)(C)O[Si](C)(C)O[Si](C)(C)O[Si](C)(C)O1
Mol. weight [g/mol]:	370.77
CAS:	541-02-6

Physical Properties

Property code	Value	Unit	Source
hvap	59.00 ± 1.00	kJ/mol	NIST Webbook
log10ws	7.50		Crippen Method
logp	3.592		Crippen Method
pc	1035.00 ± 20.00	kPa	NIST Webbook
rhoc	288.09 ± 2.87	kg/m3	NIST Webbook
rinpol	1165.00		NIST Webbook
rinpol	1161.00		NIST Webbook
rinpol	1166.00		NIST Webbook
rinpol	1215.10		NIST Webbook
rinpol	1164.00		NIST Webbook
rinpol	1160.00		NIST Webbook
rinpol	193.30		NIST Webbook
rinpol	1184.00		NIST Webbook
rinpol	1169.00		NIST Webbook
rinpol	1172.00		NIST Webbook
rinpol	1173.00		NIST Webbook
rinpol	1176.00		NIST Webbook
rinpol	1183.00		NIST Webbook
rinpol	1183.00		NIST Webbook
tc	617.40 ± 0.30	K	NIST Webbook
tf	226.00 ± 1.00	K	NIST Webbook

vc	1.287 ± 0.001	m3/kmol	NIST Webbook
volm	3.89e-04	m3/mol	Thermodynamic Study of Heptane + Silicone Mixtures. Excess Volumes and Enthalpies at 298.15 K

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpl	693.80	J/mol×K	412.77	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	721.50	J/mol×K	473.15	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	719.50	J/mol×K	469.05	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	716.90	J/mol×K	463.15	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	711.90	J/mol×K	452.40	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	638.50	J/mol×K	293.13	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane

cpl	709.20	J/mol×K	444.90	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	706.30	J/mol×K	439.98	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	703.20	J/mol×K	433.28	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	636.30	J/mol×K	288.78	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	698.50	J/mol×K	425.95	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	640.60	J/mol×K	297.95	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	643.10	J/mol×K	303.18	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	644.50	J/mol×K	308.95	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	647.70	J/mol×K	313.15	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane

cpl	650.40	J/mol×K	319.00	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	652.40	J/mol×K	323.15	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	655.10	J/mol×K	329.05	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	657.90	J/mol×K	334.74	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	659.50	J/mol×K	338.50	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	661.20	J/mol×K	342.08	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	664.50	J/mol×K	349.25	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	667.10	J/mol×K	352.20	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane

cpl	668.00	J/mol×K	356.83	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	670.10	J/mol×K	361.28	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	672.40	J/mol×K	366.35	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	674.20	J/mol×K	370.25	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	676.60	J/mol×K	375.43	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	679.10	J/mol×K	380.95	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	682.50	J/mol×K	388.65	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	684.00	J/mol×K	391.43	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	687.90	J/mol×K	399.84	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane

cpl	688.60	J/mol×K	401.55	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	691.20	J/mol×K	407.15	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
cpl	697.10	J/mol×K	419.95	Selected Physicochemical Properties of Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane
hfust	20.37	kJ/mol	226.20	NIST Webbook
hfust	20.37	kJ/mol	226.20	NIST Webbook
hvapt	52.10	kJ/mol	439.50	NIST Webbook
hvapt	49.00	kJ/mol	418.00	NIST Webbook
pvap	0.35	kPa	338.15	Temperature-Dependent Vapor Pressure of Selected Cyclic and Linear Polydimethylsiloxane Oligomers
pvap	0.19	kPa	328.15	Temperature-Dependent Vapor Pressure of Selected Cyclic and Linear Polydimethylsiloxane Oligomers
pvap	0.09	kPa	318.15	Temperature-Dependent Vapor Pressure of Selected Cyclic and Linear Polydimethylsiloxane Oligomers
pvap	0.04	kPa	308.15	Temperature-Dependent Vapor Pressure of Selected Cyclic and Linear Polydimethylsiloxane Oligomers
pvap	2.01	kPa	368.15	Temperature-Dependent Vapor Pressure of Selected Cyclic and Linear Polydimethylsiloxane Oligomers

pvap	1.16	kPa	358.15	Temperature-Dependent Vapor Pressure of Selected Cyclic and Linear Polydimethylsiloxane Oligomers
pvap	0.65	kPa	348.15	

Correlations

Information	Value
Property code	pvap
Equation	$\ln(P_{vp}) = A + B/(T + C)$
Coeff. A	1.40443e+01
Coeff. B	-3.64812e+03
Coeff. C	-9.70240e+01
Temperature range (K), min.	362.21
Temperature range (K), max.	514.77

Datasets

Speed of sound, m/s

Temperature, K - Fluid (supercritical or subcritical phases)	Pressure, kPa - Fluid (supercritical or subcritical phases)	Speed of sound, m/s - Fluid (supercritical or subcritical phases)
485.00	35.39	101.908
485.00	43.63	101.141
485.00	49.43	100.666
485.00	55.24	100.36
485.00	63.60	99.197
485.00	64.42	99.132
485.00	74.85	98.38
485.00	82.92	97.275

485.00	85.12	97.17
500.00	22.13	104.938
500.00	22.48	104.919
500.00	26.30	104.683
500.00	31.33	104.222
500.00	32.27	104.14
500.00	33.93	103.964
500.00	39.90	103.532
500.00	42.70	103.271
500.00	47.88	102.87
500.00	51.58	102.577
500.00	55.42	102.199
500.00	64.64	101.5
500.00	64.96	101.44
500.00	73.64	100.81
500.00	74.95	100.631
500.00	78.98	100.217
500.00	85.90	99.495
500.00	95.37	98.558
500.00	105.42	97.603
500.00	116.60	96.555
510.00	34.55	105.2
510.00	43.26	104.679
510.00	51.27	104.86
510.00	57.10	103.487
510.00	62.78	103.98
510.00	72.53	102.369
510.00	82.51	101.583
510.00	89.89	100.871
510.00	92.75	100.754
510.00	103.28	99.891
510.00	110.69	99.98

Reference

<https://www.doi.org/10.1016/j.fluid.2007.04.028>

Sources

Crippen Method:
Crippen Method:
Ideal-gas heat capacities of dimethylsiloxanes from Selected Physical and Chemical Properties of n-Hexamethylcyclotrisiloxane, Octamethylcyclotetrasiloxane, and Decamethylcyclopentasiloxane:

<http://pubs.acs.org/doi/abs/10.1021/ci990307l>
https://www.chemeo.com/doc/models/crippen_log10ws
<https://www.doi.org/10.1016/j.fluid.2007.04.028>
<https://www.doi.org/10.1021/je050173+>

Temperature-Dependent Vapor
Pressure of Selected Cyclic and Linear
Polysiloxanes and Cyclopentasiloxane +
Silicone Mixtures. Excess Volumes and
Enthalpies at 298.15 K:

<https://www.doi.org/10.1021/je100835n>

<https://www.doi.org/10.1021/je2007378>

<http://webbook.nist.gov/cgi/cbook.cgi?ID=C541026&Units=SI>

The Yaws Handbook of Vapor
Pressure:

<https://www.sciencedirect.com/book/9780128029992/the-yaws-handbook-of-vapor-pressure>

Legend

cpl:	Liquid phase heat capacity
hfust:	Enthalpy of fusion at a given temperature
hvap:	Enthalpy of vaporization at standard conditions
hvapt:	Enthalpy of vaporization at a given temperature
log10ws:	Log10 of Water solubility in mol/l
logp:	Octanol/Water partition coefficient
pc:	Critical Pressure
pvap:	Vapor pressure
rhoc:	Critical density
rinpol:	Non-polar retention indices
speedsl:	Speed of sound in fluid
tc:	Critical Temperature
tf:	Normal melting (fusion) point
vc:	Critical Volume
volm:	Molar Volume

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