Pentadecane

Other names: CH3(CH2)13CH3
n-Pentadecane
Inchi: InChI=1S/C15H32/c1-3-5-7-9-11-13-15-14-12-10-8-6-4-2/h3-15H2,1-2H3
InchiKey: YCOZIPAWZNQLMR-UHFFFAOYSA-N
Formula: C15H32
SMILES: CCCCCCCCCCCCCCC
Mol. weight [g/mol]: 212.41
CAS: 629-62-9

Physical Properties

Property code	Value	Unit	Source
af	0.7060		KDB
chl	-10047.30 ± 1.80	kJ/mol	NIST Webbook
gf	75.28	kJ/mol	KDB
hf	-353.00	kJ/mol	KDB
hf	-354.80 ± 2.00	kJ/mol	NIST Webbook
hfl	-428.80 ± 2.00	kJ/mol	NIST Webbook
hfus	34.61	kJ/mol	Joback Method
hsub	107.80	kJ/mol	NIST Webbook
hvap	48.98	kJ/mol	Joback Method
log10ws	-6.10		Crippen Method
logp	6.098		Crippen Method
mcvol	222.210	ml/mol	McGowan Method
pc	1479.00 ± 0.02	kPa	NIST Webbook
pc	1500.00 ± 200.00	kPa	NIST Webbook
pc	1480.00	kPa	KDB
rhoc	220.91 ± 0.64	kg/m3	NIST Webbook
rhoc	212.41 ± 42.48	kg/m3	NIST Webbook
rinpol	264.60		NIST Webbook
rinpol	252.61		NIST Webbook
rinpol	256.12		NIST Webbook
sg	738.94	J/mol×K	NIST Webbook
sl	587.52	J/mol×K	NIST Webbook
tb	541.15 ± 0.60	K	NIST Webbook
tb	549.55 ± 4.00	K	NIST Webbook
tb	543.70	K	KDB
tb	530.00 ± 3.00	K	NIST Webbook

tb	546.20 ± 2.00	K	NIST Webbook
tb	537.70 ± 4.00	K	NIST Webbook
tb	510.00 ± 6.00	K	NIST Webbook
tb	530.00 ± 3.00	K	NIST Webbook
tb	544.00 ± 3.00	K	NIST Webbook
tb	543.80	K	NIST Webbook
tc	708.00	K	KDB
tf	282.30 ± 0.60	K	NIST Webbook
tf	283.00	K	KDB
tf	283.05 ± 0.50	K	NIST Webbook
tf	283.10 ± 0.50	K	NIST Webbook
tf	282.25 ± 0.50	K	NIST Webbook
tf	283.00 ± 2.00	K	NIST Webbook
tf	283.00 ± 2.00	K	NIST Webbook
tf	283.00 ± 3.00	K	NIST Webbook
tf	283.06 ± 0.02	K	NIST Webbook
tf	283.06 ± 0.02	K	NIST Webbook
tf	281.70 ± 2.00	K	NIST Webbook
tf	281.00 ± 4.00	K	NIST Webbook
tf	282.90 ± 1.00	K	NIST Webbook
tf	283.10 ± 0.40	K	NIST Webbook
tf	283.10 ± 0.40	K	NIST Webbook
tf	282.90 ± 0.50	K	NIST Webbook
tf	283.08 ± 0.03	K	NIST Webbook
tf	283.06 ± 0.04	K	NIST Webbook
tf	283.06 ± 0.05	K	NIST Webbook
tf	283.08 ± 0.01	K	NIST Webbook
tf	282.96 ± 0.20	K	NIST Webbook
tf	283.02 ± 0.04	K	NIST Webbook
tf	282.96 ± 0.08	K	NIST Webbook
tf	283.00 ± 3.00	K	NIST Webbook
tf	287.15 ± 3.00	K	NIST Webbook
tt	283.10 ± 0.05	K	NIST Webbook
tt	283.09 ± 0.20	K	NIST Webbook
tt	283.10 ± 0.20	K	NIST Webbook
tt	283.10 ± 0.02	K	NIST Webbook
vc	0.966	m3/kmol	KDB
vc	0.966	m3/kmol	NIST Webbook
zc	0.2428670		KDB

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	558.03	J/mol×K	542.60	Joback Method
cpg	611.85	J/mol×K	622.14	Joback Method
cpg	594.61	J/mol×K	595.63	Joback Method
cpg	576.68	J/mol×K	569.11	Joback Method
cpg	659.59	J/mol×K	701.68	Joback Method
cpg	644.32	J/mol×K	675.16	Joback Method
cpg	628.41	J/mol×K	648.65	Joback Method
cpl	468.81	J/mol×K	298.15	NIST Webbook
cpl	467.81	J/mol×K	298.15	NIST Webbook
cpl	469.95	J/mol×K	298.15	NIST Webbook
cpl	470.48	J/mol×K	298.15	NIST Webbook
dvisc	0.0009178	Pa×s	353.41	Joback Method
dvisc	0.0019494	Pa×s	306.11	Joback Method
dvisc	0.0001677	Pa×s	542.60	Joback Method
dvisc	0.0002271	Pa×s	495.30	Joback Method
dvisc	0.0003279	Pa×s	448.00	Joback Method
dvisc	0.0005163	Pa×s	400.71	Joback Method
dvisc	0.0054526	Pa×s	258.81	Joback Method
hfust	34.60	kJ/mol	283.10	NIST Webbook
hfust	9.17	kJ/mol	270.90	NIST Webbook
hfust	34.20	kJ/mol	282.70	NIST Webbook
hfust	34.60	kJ/mol	283.10	NIST Webbook
hvapt	49.45	kJ/mol	543.60	KDB
hvapt	72.90	kJ/mol	334.00	NIST Webbook
hvapt	71.80	kJ/mol	344.00	NIST Webbook
hvapt	59.60	kJ/mol	496.50	NIST Webbook
hvapt	66.40	kJ/mol	371.00	NIST Webbook
hvapt	61.90	kJ/mol	447.00	NIST Webbook
hvapt	72.20 ± 1.20	kJ/mol	333.00	NIST Webbook
hvapt	68.80	kJ/mol	373.00	NIST Webbook
hvapt	67.50	kJ/mol	387.50	NIST Webbook
hvapt	70.80	kJ/mol	353.00	NIST Webbook

rfi	1.42120		318.15	Thermodynamic properties of (an ester + an alkane). XVI. Experimental HEm and V Em values and a new correlation method for (an alkyl ethanoate + an n-alkane) at 318.15 K
rhol	769.00	kg/m3	293.00	KDB
sfust	122.17	J/mol×K	283.10	NIST Webbook
sfust	33.85	J/mol×K	270.90	NIST Webbook
srf	0.03	N/m	293.20	KDB

Pressure Dependent Properties

Property code	Value	Unit	Pressure [kPa]	Source
tbrp	409.20	K	1.30	NIST Webbook
tfp	287.80	K	20000.00	Liquid solid equilibria under high pressure of tetradecane + pentadecane and tetradecane + hexadecane binary systems
tfp	291.90	K	40000.00	Liquid solid equilibria under high pressure of tetradecane + pentadecane and tetradecane + hexadecane binary systems
tfp	296.20	K	60000.00	Liquid solid equilibria under high pressure of tetradecane + pentadecane and tetradecane + hexadecane binary systems
tfp	300.10	K	80000.00	Liquid solid equilibria under high pressure of tetradecane + pentadecane and tetradecane + hexadecane binary systems

tfp	303.90	K	100000.00	Liquid solid equilibria under high pressure of tetradecane + pentadecane and tetradecane + hexadecane binary systems
tfp	283.20	K	100.00	Liquid solid equilibria under high pressure of tetradecane + pentadecane and tetradecane + hexadecane binary systems

Correlations

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/(T + C)
Coeff. A	1.50926e+01
Coeff. B	-4.66658e+03
Coeff. C	-9.44730e+01
Temperature range (K), min.	409.68
Temperature range (K), max.	571.57

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/T + C*ln(T) + D*T^2
Coeff. A	1.87806e+02
Coeff. B	-1.64631e+04
Coeff. C	-2.47923e+01
Coeff. D	1.09741e-05
Temperature range (K), min.	283.10
Temperature range (K), max.	706.80

Datasets

Thermal conductivity, W/m/K

Temperature, K - Liquid	Pressure, kPa - Liquid	Thermal conductivity, W/m/K - Liquid
318.45	21080.00	0.1432
318.40	21080.00	0.1429
318.42	21080.00	0.1432
318.36	15320.00	0.1419
318.44	15320.00	0.1408
318.44	15320.00	0.1415
318.54	10340.00	0.1390
318.56	10340.00	0.1394
318.50	10340.00	0.1403
318.49	5220.00	0.1386
318.59	5220.00	0.1377
318.52	5220.00	0.1382
318.28	1420.00	0.1369
318.31	1420.00	0.1380
318.40	1420.00	0.1376
336.96	20240.00	0.1393
337.10	20240.00	0.1399
337.13	20240.00	0.1401
337.02	15360.00	0.1403
337.20	15360.00	0.1372
337.14	15360.00	0.1368
337.25	10510.00	0.1368
337.28	10510.00	0.1356
337.04	5660.00	0.1338
337.09	5660.00	0.1353
337.14	5660.00	0.1361
337.22	1270.00	0.1320
337.24	1270.00	0.1338
337.18	1270.00	0.1332
356.75	20580.00	0.1355
356.79	20580.00	0.1377
356.90	20580.00	0.1346
356.74	15190.00	0.1321
356.83	15190.00	0.1341
356.80	15190.00	0.1320
356.68	10160.00	0.1329
356.72	10160.00	0.1314
356.71	10160.00	0.1307

356.45	5190.00	0.1334
356.57	5190.00	0.1301
356.61	5190.00	0.1310
356.75	1040.00	0.1300
356.70	1040.00	0.1284
356.70	1040.00	0.1284
377.61	20480.00	0.1326
377.60	20480.00	0.1304
377.52	20480.00	0.1310
377.70	15010.00	0.1284
377.73	15010.00	0.1274
377.62	15010.00	0.1288
377.40	10240.00	0.1302
377.33	10240.00	0.1296
377.46	10240.00	0.1284
377.39	5560.00	0.1272
377.30	5560.00	0.1275
377.31	5560.00	0.1262
377.44	1420.00	0.1248
377.53	1420.00	0.1234
377.60	1420.00	0.1238
396.74	20460.00	0.1297
396.83	20460.00	0.1291
397.07	20460.00	0.1276
397.32	15100.00	0.1242
397.31	15080.00	0.1229
397.22	15080.00	0.1248
397.22	10360.00	0.1224
397.24	10360.00	0.1252
397.38	10410.00	0.1225
397.44	5360.00	0.1209
397.57	5360.00	0.1176
397.52	5360.00	0.1202
397.42	1330.00	0.1182
397.47	1330.00	0.1188
397.49	1330.00	0.1165
417.13	20250.00	0.1228
417.30	20250.00	0.1195
417.16	15230.00	0.1204
417.26	15230.00	0.1223
417.19	15230.00	0.1227
417.27	10550.00	0.1227
417.47	10430.00	0.1185
417.50	10430.00	0.1178

417.11	5290.00	0.1210
417.37	1130.00	0.1150
417.36	1130.00	0.1134
417.48	1130.00	0.1123
436.78	20320.00	0.1187
436.73	20320.00	0.1172
437.06	15070.00	0.1143
437.08	15070.00	0.1135
437.10	15070.00	0.1133
437.12	10470.00	0.1112
436.98	10580.00	0.1145
436.90	10760.00	0.1134
436.95	5250.00	0.1110
437.14	5250.00	0.1103
437.10	5250.00	0.1106
437.06	1280.00	0.1105
437.11	1280.00	0.1079
437.25	1280.00	0.1089
456.52	20460.00	0.1176
456.48	20550.00	0.1176
456.66	20460.00	0.1130
456.86	15300.00	0.1132
456.90	15300.00	0.1124
456.94	15300.00	0.1116
457.03	10370.00	0.1096
457.37	10270.00	0.1084
457.33	10250.00	0.1104
457.18	5400.00	0.1082
457.40	5440.00	0.1059
457.32	5440.00	0.1063
457.03	1550.00	0.1063
457.04	1560.00	0.1059
457.02	1540.00	0.1032
476.68	20310.00	0.1140
477.06	20970.00	0.1128
476.90	20850.00	0.1106
476.72	15160.00	0.1061
477.00	15160.00	0.1082
476.95	15160.00	0.1094
476.97	10330.00	0.1092
477.29	10330.00	0.1023
477.30	10330.00	0.1044
477.30	5120.00	0.1024
477.32	5120.00	0.1031

477.24	5120.00	0.1033
477.33	1080.00	0.0988
477.29	1080.00	0.0998
477.61	1080.00	0.1038
496.62	20420.00	0.1110
496.95	20420.00	0.1039
496.90	20420.00	0.1069
496.97	15010.00	0.1021
496.96	15010.00	0.1033
496.97	15010.00	0.1050
497.04	10470.00	0.1024
496.94	10500.00	0.1020
497.00	10530.00	0.1008
497.15	5430.00	0.0965
496.95	5430.00	0.0983
497.10	5410.00	0.0981
516.84	20110.00	0.0998
516.89	20110.00	0.1031
517.00	20100.00	0.1021
517.03	15180.00	0.0990
516.81	15180.00	0.1040
517.00	15180.00	0.0984
517.12	5490.00	0.0948
517.19	5490.00	0.0940
517.20	5490.00	0.0941
536.59	20650.00	0.1039
536.59	20650.00	0.1025
536.85	20650.00	0.0995
536.99	15650.00	0.1001
537.13	15650.00	0.0975
537.14	10120.00	0.0972
537.39	5310.00	0.0872
556.90	20180.00	0.0999
557.06	20180.00	0.0980
557.00	20180.00	0.0986
556.82	15300.00	0.1002
557.14	15300.00	0.0924
557.12	15300.00	0.0941
556.93	10380.00	0.0967
557.05	10380.00	0.0943
556.55	5420.00	0.0851
576.55	20450.00	0.0998
577.06	20450.00	0.0928
576.95	20450.00	0.0961

577.12	15190.00	0.0924
577.08	15190.00	0.0923
577.15	15190.00	0.0900
577.16	10320.00	0.0907
577.01	10240.00	0.0944
577.12	10300.00	0.0889
577.10	5140.00	0.0897
577.17	5140.00	0.0888
577.25	5140.00	0.0876

Reference *https://www.doi.org/10.1007/s10765-019-2537-x*

Sources

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Joback Method:	https://en.wikipedia.org/wiki/Joback_method
Thermal Conductivity of n-Pentadecane (C15H32):	https://www.doi.org/10.1007/s10765-019-2537-x
McGowan Method:	http://link.springer.com/article/10.1007/BF02311772

Legend

af:	Acentric Factor

chl:	Standard liquid enthalpy of combustion
cpg:	Ideal gas heat capacity
cpl:	Liquid phase heat capacity
dvisc:	Dynamic viscosity
gf:	Standard Gibbs free energy of formation
hf:	Enthalpy of formation at standard conditions
hfl:	Liquid phase enthalpy of formation at standard conditions
hfus:	Enthalpy of fusion at standard conditions
hfust:	Enthalpy of fusion at a given temperature
hsub:	Enthalpy of sublimation at standard conditions
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
mcvol:	McGowan's characteristic volume
pc:	Critical Pressure
pvap:	Vapor pressure
rfi:	Refractive Index
rhoc:	Critical density
rhol:	Liquid Density
rinpol:	Non-polar retention indices
sfust:	Entropy of fusion at a given temperature
sg:	Molar entropy at standard conditions
sl:	Liquid phase molar entropy at standard conditions
srf:	Surface Tension
tb:	Normal Boiling Point Temperature
tbrp:	Boiling point at reduced pressure
tc:	Critical Temperature
tcondl:	Liquid thermal conductivity
tf:	Normal melting (fusion) point
tfp:	Melting point
tt:	Triple Point Temperature
vc:	Critical Volume
zc:	Critical Compressibility