

Naphthalene, decahydro-, trans-

Other names:	(E)-Decahydronaphthalene Decahydronaphthalene, (E)- Decahydronaphthalene, trans- t-Decalin trans-Bicyclo[4.4.0]Decane trans-Decahydronaphthalene trans-Decalin trans-Decaline trans-Perhydronaphthalene
Inchi:	InChI=1S/C10H18/c1-2-6-10-8-4-3-7-9(10)5-1/h9-10H,1-8H2/t9-,10-
InchiKey:	NNBZCPXTIHJB JL-MGCOHNPYSA-N
Formula:	C10H18
SMILES:	C1CCC2CCCCC2C1
Mol. weight [g/mol]:	138.25
CAS:	493-02-7

Physical Properties

Property code	Value	Unit	Source
chl	-6276.96 ± 0.92	kJ/mol	NIST Webbook
chl	-6278.90 ± 1.30	kJ/mol	NIST Webbook
chl	-6264.00 ± 2.00	kJ/mol	NIST Webbook
chl	-6255.90	kJ/mol	NIST Webbook
chl	-6268.20 ± 4.60	kJ/mol	NIST Webbook
gf	106.42	kJ/mol	Joback Method
hf	-182.20 ± 2.30	kJ/mol	NIST Webbook
hf	-180.20	kJ/mol	NIST Webbook
hfl	-228.70 ± 1.30	kJ/mol	NIST Webbook
hfl	-230.70 ± 0.92	kJ/mol	NIST Webbook
hfus	9.53	kJ/mol	Joback Method
hsub	64.30	kJ/mol	NIST Webbook
hvap	48.50	kJ/mol	NIST Webbook
hvap	42.84	kJ/mol	NIST Webbook
hvap	48.50 ± 2.10	kJ/mol	NIST Webbook
ie	9.32 ± 0.05	eV	NIST Webbook
ie	9.32 ± 0.05	eV	NIST Webbook
ie	9.35	eV	NIST Webbook
ie	9.38 ± 0.01	eV	NIST Webbook

log10ws	-3.31		Crippen Method
logp	3.367		Crippen Method
mcvol	130.040	ml/mol	McGowan Method
pc	3025.61	kPa	Joback Method
rinpol	1049.00		NIST Webbook
rinpol	1051.00		NIST Webbook
rinpol	1053.00		NIST Webbook
rinpol	1066.00		NIST Webbook
rinpol	1075.00		NIST Webbook
rinpol	1046.00		NIST Webbook
rinpol	1058.00		NIST Webbook
rinpol	1057.00		NIST Webbook
rinpol	1078.00		NIST Webbook
rinpol	1057.00		NIST Webbook
rinpol	1057.00		NIST Webbook
rinpol	1075.00		NIST Webbook
rinpol	1061.00		NIST Webbook
rinpol	1084.00		NIST Webbook
rinpol	1074.00		NIST Webbook
rinpol	1042.00		NIST Webbook
rinpol	1049.00		NIST Webbook
rinpol	1057.00		NIST Webbook
rinpol	1075.00		NIST Webbook
rinpol	1069.30		NIST Webbook
rinpol	1059.00		NIST Webbook
rinpol	1059.00		NIST Webbook
rinpol	1068.00		NIST Webbook
rinpol	1085.00		NIST Webbook
rinpol	1057.00		NIST Webbook
rinpol	1057.00		NIST Webbook
rinpol	1062.00		NIST Webbook
rinpol	1051.00		NIST Webbook
rinpol	1041.70		NIST Webbook
rinpol	1078.00		NIST Webbook
rinpol	1090.00		NIST Webbook
rinpol	1049.00		NIST Webbook
rinpol	1064.70		NIST Webbook
rinpol	1075.00		NIST Webbook
rinpol	1082.50		NIST Webbook
rinpol	1064.70		NIST Webbook
rinpol	1069.30		NIST Webbook
rinpol	1064.00		NIST Webbook
rinpol	1087.00		NIST Webbook
rinpol	1070.00		NIST Webbook

rinpol	1082.00		NIST Webbook
rinpol	1081.00		NIST Webbook
rinpol	1061.00		NIST Webbook
rinpol	1043.00		NIST Webbook
rinpol	1097.00		NIST Webbook
rinpol	1052.85		NIST Webbook
rinpol	1055.00		NIST Webbook
rinpol	1080.00		NIST Webbook
rinpol	1049.80		NIST Webbook
rinpol	1045.70		NIST Webbook
rinpol	1051.80		NIST Webbook
rinpol	1055.90		NIST Webbook
rinpol	1038.70		NIST Webbook
rinpol	1045.70		NIST Webbook
rinpol	1051.80		NIST Webbook
rinpol	1055.90		NIST Webbook
rinpol	1051.80		NIST Webbook
rinpol	1049.80		NIST Webbook
rinpol	1048.00		NIST Webbook
rinpol	1047.88		NIST Webbook
rinpol	1037.52		NIST Webbook
rinpol	1044.69		NIST Webbook
rinpol	1049.50		NIST Webbook
rinpol	1048.56		NIST Webbook
rinpol	1056.17		NIST Webbook
rinpol	1061.35		NIST Webbook
rinpol	1043.00		NIST Webbook
rinpol	1049.00		NIST Webbook
rinpol	1051.80		NIST Webbook
rinpol	1076.00		NIST Webbook
ripol	1163.00		NIST Webbook
ripol	1160.90		NIST Webbook
ripol	1170.00		NIST Webbook
ripol	1209.00		NIST Webbook
ripol	1218.00		NIST Webbook
ripol	1161.00		NIST Webbook
ripol	1227.00		NIST Webbook
ripol	1156.00		NIST Webbook
ripol	1160.90		NIST Webbook
ripol	1170.00		NIST Webbook
ripol	1195.00		NIST Webbook
sl	264.93	J/mol×K	NIST Webbook
tb	458.76	K	Joback Method
tc	960.15 ± 1.30	K	NIST Webbook

tc	687.00 ± 3.00	K	NIST Webbook
tf	224.26	K	Joback Method
tt	242.77 ± 0.07	K	NIST Webbook
tt	242.77 ± 0.05	K	NIST Webbook
tt	242.40 ± 0.20	K	NIST Webbook
vc	0.477	m3/kmol	Joback Method

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	272.29	J/mol×K	450.00	NIST Webbook
cpg	237.53	J/mol×K	400.00	NIST Webbook
cpl	228.49	J/mol×K	298.15	NIST Webbook
cpl	229.17	J/mol×K	298.15	NIST Webbook
cpl	229.17	J/mol×K	298.15	NIST Webbook
cpl	250.60	J/mol×K	313.00	NIST Webbook
cpl	229.17	J/mol×K	298.15	NIST Webbook
cpl	217.72	J/mol×K	298.15	NIST Webbook
cpl	226.86	J/mol×K	298.00	NIST Webbook
dvisc	0.0005024	Pa×s	419.68	Joback Method
dvisc	0.0009023	Pa×s	341.51	Joback Method
dvisc	0.0046703	Pa×s	224.26	Joback Method
dvisc	0.0013547	Pa×s	302.43	Joback Method
dvisc	0.0004040	Pa×s	458.76	Joback Method
dvisc	0.0006533	Pa×s	380.59	Joback Method
dvisc	0.0022946	Pa×s	263.34	Joback Method
hfust	3.24	kJ/mol	242.40	NIST Webbook
hfust	2.13	kJ/mol	216.10	NIST Webbook
hfust	9.49	kJ/mol	230.20	NIST Webbook
hfust	9.49	kJ/mol	230.20	NIST Webbook
hsubt	66.20	kJ/mol	241.00	NIST Webbook
hvapt	44.20	kJ/mol	412.00	NIST Webbook
rfi	1.46820		298.20	Liquid liquid equilibrium data for water + ethanol + trans-decalin: Measurement and predication

rhoI	851.14	kg/m3	318.15	Excess Molar Volume along with Viscosity, Flash Point, and Refractive Index for Binary Mixtures of cis-Decalin or trans-Decalin with C9 to C11 n-Alkanes
rhoI	862.34	kg/m3	303.15	Excess Molar Volume along with Viscosity, Flash Point, and Refractive Index for Binary Mixtures of cis-Decalin or trans-Decalin with C9 to C11 n-Alkanes
rhoI	866.07	kg/m3	298.15	Excess Molar Volume along with Viscosity, Flash Point, and Refractive Index for Binary Mixtures of cis-Decalin or trans-Decalin with C9 to C11 n-Alkanes
rhoI	858.61	kg/m3	308.15	Excess Molar Volume along with Viscosity, Flash Point, and Refractive Index for Binary Mixtures of cis-Decalin or trans-Decalin with C9 to C11 n-Alkanes
rhoI	869.78	kg/m3	293.15	Excess Molar Volume along with Viscosity, Flash Point, and Refractive Index for Binary Mixtures of cis-Decalin or trans-Decalin with C9 to C11 n-Alkanes

rhoI	809.40	kg/m3	373.15	Density and Viscosity from 293.15 to 373.15 K, Speed of Sound and Bulk Modulus from 293.15 to 343.15 K, Surface Tension, and Flash Point of Binary Mixtures of Bicyclohexyl and 1,2,3,4-Tetrahydronaphthalene or Trans-decahydronaphthalene at 0.1 MPa
rhoI	817.00	kg/m3	363.15	Density and Viscosity from 293.15 to 373.15 K, Speed of Sound and Bulk Modulus from 293.15 to 343.15 K, Surface Tension, and Flash Point of Binary Mixtures of Bicyclohexyl and 1,2,3,4-Tetrahydronaphthalene or Trans-decahydronaphthalene at 0.1 MPa
rhoI	854.88	kg/m3	313.15	Excess Molar Volume along with Viscosity, Flash Point, and Refractive Index for Binary Mixtures of cis-Decalin or trans-Decalin with C9 to C11 n-Alkanes
rhoI	847.40	kg/m3	323.15	Excess Molar Volume along with Viscosity, Flash Point, and Refractive Index for Binary Mixtures of cis-Decalin or trans-Decalin with C9 to C11 n-Alkanes

rhoI	832.30	kg/m3	343.15	Density and Viscosity from 293.15 to 373.15 K, Speed of Sound and Bulk Modulus from 293.15 to 343.15 K, Surface Tension, and Flash Point of Binary Mixtures of Bicyclohexyl and 1,2,3,4-Tetrahydronaphthalene or Trans-decahydronaphthalene at 0.1 MPa
rhoI	839.83	kg/m3	333.15	Density and Viscosity from 293.15 to 373.15 K, Speed of Sound and Bulk Modulus from 293.15 to 343.15 K, Surface Tension, and Flash Point of Binary Mixtures of Bicyclohexyl and 1,2,3,4-Tetrahydronaphthalene or Trans-decahydronaphthalene at 0.1 MPa
rhoI	847.34	kg/m3	323.15	Density and Viscosity from 293.15 to 373.15 K, Speed of Sound and Bulk Modulus from 293.15 to 343.15 K, Surface Tension, and Flash Point of Binary Mixtures of Bicyclohexyl and 1,2,3,4-Tetrahydronaphthalene or Trans-decahydronaphthalene at 0.1 MPa

rhoI	854.82	kg/m3	313.15	Density and Viscosity from 293.15 to 373.15 K, Speed of Sound and Bulk Modulus from 293.15 to 343.15 K, Surface Tension, and Flash Point of Binary Mixtures of Bicyclohexyl and 1,2,3,4-Tetrahydronaphthalene or Trans-decahydronaphthalene at 0.1 MPa
rhoI	862.29	kg/m3	303.15	Density and Viscosity from 293.15 to 373.15 K, Speed of Sound and Bulk Modulus from 293.15 to 343.15 K, Surface Tension, and Flash Point of Binary Mixtures of Bicyclohexyl and 1,2,3,4-Tetrahydronaphthalene or Trans-decahydronaphthalene at 0.1 MPa
rhoI	869.75	kg/m3	293.15	Density and Viscosity from 293.15 to 373.15 K, Speed of Sound and Bulk Modulus from 293.15 to 343.15 K, Surface Tension, and Flash Point of Binary Mixtures of Bicyclohexyl and 1,2,3,4-Tetrahydronaphthalene or Trans-decahydronaphthalene at 0.1 MPa

rho1	824.70	kg/m3	353.15	Density and Viscosity from 293.15 to 373.15 K, Speed of Sound and Bulk Modulus from 293.15 to 343.15 K, Surface Tension, and Flash Point of Binary Mixtures of Bicyclohexyl and 1,2,3,4-Tetrahydronaphthalene or Trans-decahydronaphthalene at 0.1 MPa
sfust	13.40	J/mol×K	242.40	NIST Webbook
sfust	41.22	J/mol×K	230.20	NIST Webbook
sfust	9.87	J/mol×K	216.10	NIST Webbook

Pressure Dependent Properties

Property code	Value	Unit	Pressure [kPa]	Source
tbrp	458.20	K	101.00	NIST Webbook

Correlations

Information	Value
Property code	pvap
Equation	$\ln(P_{vp}) = A + B/(T + C)$
Coeff. A	1.37820e+01
Coeff. B	-3.58156e+03
Coeff. C	-6.91580e+01
Temperature range (K), min.	334.57
Temperature range (K), max.	491.98

Datasets

Mass density, kg/m3

Temperature, K - Liquid	Pressure, kPa - Liquid	Mass density, kg/m3 - Liquid
303.15	100.00	862.1
303.15	5000.00	865.4
303.15	10000.00	868.7
303.15	15000.00	871.6
303.15	20000.00	874.6
303.15	25000.00	877.6
303.15	30000.00	880.3
303.15	35000.00	882.9
303.15	40000.00	885.6
303.15	45000.00	888.2
303.15	50000.00	890.6
303.15	55000.00	893.0
303.15	60000.00	895.3
303.15	65000.00	897.6
323.15	100.00	847.1
323.15	5000.00	850.9
323.15	10000.00	854.4
323.15	15000.00	857.8
323.15	20000.00	861.0
323.15	25000.00	864.1
323.15	30000.00	867.1
323.15	35000.00	870.0
323.15	40000.00	872.8
323.15	45000.00	875.6
323.15	50000.00	878.3
323.15	55000.00	880.8
323.15	60000.00	883.4
323.15	65000.00	885.8
343.15	100.00	832.0
343.15	5000.00	836.2
343.15	10000.00	840.1
343.15	15000.00	843.9
343.15	20000.00	847.4
343.15	25000.00	850.8
343.15	30000.00	854.1
343.15	35000.00	857.2
343.15	40000.00	860.3
343.15	45000.00	863.2
343.15	50000.00	866.1

hfust:	Enthalpy of fusion at a given temperature
hsub:	Enthalpy of sublimation at standard conditions
hsubt:	Enthalpy of sublimation at a given temperature
hvap:	Enthalpy of vaporization at standard conditions
hvapt:	Enthalpy of vaporization at a given temperature
ie:	Ionization energy
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
rho:	Liquid Density
rinpol:	Non-polar retention indices
ripol:	Polar retention indices
sfust:	Entropy of fusion at a given temperature
sl:	Liquid phase molar entropy at standard conditions
tb:	Normal Boiling Point Temperature
tbrp:	Boiling point at reduced pressure
tc:	Critical Temperature
tf:	Normal melting (fusion) point
tt:	Triple Point Temperature
vc:	Critical Volume

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