Nonane, 2-methyl-

Other names: 2-Methylnonane
Inchi: InChI=1S/C10H22/c1-4-5-6-7-8-9-10(2)3/h10H,4-9H2,1-3H3
InchiKey: SGVYKUFIHHTIFL-UHFFFAOYSA-N
Formula: C10H22
SMILES: CCCCCCCC(C)C
Mol. weight [g/mol]: 142.28
CAS: 871-83-0

Physical Properties

Property code	Value	Unit	Source
af	0.4590		KDB
ap	353.450	K	KDB
chl	-6769.50 ± 2.30	kJ/mol	NIST Webbook
gf	30.88	kJ/mol	Joback Method
hcg	6772.98	kJ/mol	KDB
hcn	6288.845	kJ/mol	KDB
hf	-260.20	kJ/mol	NIST Webbook
hfl	-309.80 ± 2.40	kJ/mol	NIST Webbook
hfus	18.13	kJ/mol	Joback Method
hvap	49.64	kJ/mol	NIST Webbook
hvap	51.00	kJ/mol	NIST Webbook
log10ws	-3.77		Crippen Method
logp	4.003		Crippen Method
mcvol	151.760	ml/mol	McGowan Method
pc	2100.00	kPa	KDB
rinpol	964.43		NIST Webbook
rinpol	962.00		NIST Webbook
rinpol	962.00		NIST Webbook
rinpol	962.00		NIST Webbook
rinpol	976.00		NIST Webbook
rinpol	966.00		NIST Webbook
rinpol	964.00		NIST Webbook
rinpol	964.00		NIST Webbook
rinpol	972.00		NIST Webbook
rinpol	972.00		NIST Webbook
rinpol	965.20		NIST Webbook
rinpol	964.00		NIST Webbook

rinpol	962.00	NIST Webbook
rinpol	963.90	NIST Webbook
rinpol	964.70	NIST Webbook
rinpol	965.00	NIST Webbook
rinpol	964.00	NIST Webbook
rinpol	966.00	NIST Webbook
rinpol	968.00	NIST Webbook
rinpol	964.00	NIST Webbook
rinpol	966.00	NIST Webbook
rinpol	965.00	NIST Webbook
rinpol	967.00	NIST Webbook
rinpol	968.00	NIST Webbook
rinpol	963.00	NIST Webbook
rinpol	964.43	NIST Webbook
rinpol	964.43	NIST Webbook
rinpol	963.80	NIST Webbook
rinpol	964.00	NIST Webbook
rinpol	964.00	NIST Webbook
rinpol	964.00	NIST Webbook
rinpol	964.00	NIST Webbook
rinpol	964.00	NIST Webbook
rinpol	971.70	NIST Webbook
rinpol	974.00	NIST Webbook
rinpol	964.00	NIST Webbook
rinpol	965.00	NIST Webbook
rinpol	966.20	NIST Webbook
rinpol	962.60	NIST Webbook
rinpol	964.00	NIST Webbook
rinpol	965.10	NIST Webbook
rinpol	968.60	NIST Webbook
rinpol	965.00	NIST Webbook
rinpol	964.00	NIST Webbook
rinpol	965.96	NIST Webbook
rinpol	966.07	NIST Webbook
rinpol	966.05	NIST Webbook
rinpol	965.23	NIST Webbook
rinpol	965.28	NIST Webbook
rinpol	965.28	NIST Webbook
rinpol	964.00	NIST Webbook
rinpol	962.00	NIST Webbook
rinpol	980.70	NIST Webbook
rinpol	964.00	NIST Webbook
rinpol	965.00	NIST Webbook
rinpol	966.00	NIST Webbook

rinpol	969.00		NIST Webbook
rinpol	964.00		NIST Webbook
rinpol	968.00		NIST Webbook
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rinpol	970.00		NIST Webbook
rinpol	966.00		NIST Webbook
rinpol	963.00		NIST Webbook
rinpol	965.00		NIST Webbook
rinpol	987.00		NIST Webbook
rinpol	966.00		NIST Webbook
rinpol	964.00		NIST Webbook
rinpol	966.00		NIST Webbook
rinpol	964.00		NIST Webbook
rinpol	964.00		NIST Webbook
rinpol	973.00		NIST Webbook
rinpol	972.00		NIST Webbook
rinpol	964.00		NIST Webbook
rinpol	964.00		NIST Webbook
rinpol	965.00		NIST Webbook
rinpol	966.00		NIST Webbook
rinpol	965.20		NIST Webbook
rinpol	964.80		NIST Webbook
rinpol	971.70		NIST Webbook
sl	420.10	J/mol×K	NIST Webbook
tb	440.00	K	NIST Webbook
tb	440.00 ± 0.30	K	NIST Webbook
tb	440.20	K	NIST Webbook
tb	440.20	K	KDB
tb	440.15 ± 0.15	K	NIST Webbook
tc	610.30	K	KDB
tc	610.70	K	NIST Webbook
tf	199.00	K	KDB
tf	198.79 ± 0.20	K	NIST Webbook
tf	201.50 ± 0.15	K	NIST Webbook
tt	198.80 ± 0.20	K	NIST Webbook
vc	0.596	m3/kmol	KDB
zc	0.2466530		KDB

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	330.79	J/mol×K	455.42	Joback Method
cpg	315.29	J/mol×K	427.76	Joback Method
cpg	345.71	J/mol×K	483.08	Joback Method
cpg	360.07	J/mol×K	510.75	Joback Method
cpg	373.88	J/mol×K	538.41	Joback Method
cpg	387.16	J/mol×K	566.07	Joback Method
cpg	399.91	J/mol×K	593.73	Joback Method
cpl	313.30	J/mol×K	298.10	NIST Webbook
dvisc	0.0108083	Pa×s	187.46	Joback Method
dvisc	0.0002265	Pa×s	427.76	Joback Method
dvisc	0.0003093	Pa×s	387.71	Joback Method
dvisc	0.0004537	Pa×s	347.66	Joback Method
dvisc	0.0007355	Pa×s	307.61	Joback Method
dvisc	0.0013777	Pa×s	267.56	Joback Method
dvisc	0.0032190	Pa×s	227.51	Joback Method
hfust	17.49	kJ/mol	198.80	NIST Webbook
hfust	17.49	kJ/mol	198.80	NIST Webbook
hfust	17.49	kJ/mol	198.80	NIST Webbook
hvapt	39.20	kJ/mol	440.20	KDB
hvapt	38.23	kJ/mol	440.20	NIST Webbook
hvapt	46.20 ± 0.20	kJ/mol	343.00	NIST Webbook
hvapt	47.30 ± 0.20	kJ/mol	328.00	NIST Webbook
hvapt	46.40 ± 0.20	kJ/mol	382.50	NIST Webbook
hvapt	45.00 ± 0.20	kJ/mol	358.00	NIST Webbook
rfi	1.40750		298.15	KDB
rhol	719.40	kg/m3	303.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels
rhol	684.45	kg/m3	348.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane

rhol	664.34	kg/m3	373.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	643.46	kg/m3	398.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	621.59	kg/m3	423.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	734.70	kg/m3	283.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels
rhol	727.10	kg/m3	293.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels
rhol	704.14	kg/m3	323.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	711.70	kg/m3	313.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels

rhol	703.90	kg/m3	323.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels
rhol	696.00	kg/m3	333.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels
rhol	688.10	kg/m3	343.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels
rhol	680.20	kg/m3	353.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels
rhol	672.10	kg/m3	363.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels
rhol	664.00	kg/m3	373.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels
rhol	734.50	kg/m3	283.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels

rhol	726.90	kg/m3	293.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels
rhol	719.30	kg/m3	303.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels
rhol	711.60	kg/m3	313.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels
rhol	703.90	kg/m3	323.15	Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels
rhol	723.54	kg/m3	298.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	672.81	kg/m3	363.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	676.83	kg/m3	358.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane

rhol	680.89	kg/m3	353.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	684.90	kg/m3	348.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	688.88	kg/m3	343.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	692.85	kg/m3	338.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	696.79	kg/m3	333.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	700.72	kg/m3	328.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	704.63	kg/m3	323.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	708.49	kg/m3	318.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	712.27	kg/m3	313.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane

rhol	716.11	kg/m3	308.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	719.96	kg/m3	303.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	723.63	kg/m3	298.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	727.47	kg/m3	293.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	735.13	kg/m3	283.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
rhol	731.33	kg/m3	288.15	Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane
sfust	87.97	J/mol×K	198.80	NIST Webbook

Correlations

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/(T + C)
Coeff. A	1.44006e+01
Coeff. B	-3.68356e+03
Coeff. C	-6.35970e+01
Temperature range (K), min.	324.60

Temperature range (K), max.	468.87

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/T + C*ln(T) + D*T^2
Coeff. A	1.28452e+02
Coeff. B	-1.05839e+04
Coeff. C	-1.67146e+01
Coeff. D	1.00957e-05
Temperature range (K), min.	198.50
Temperature range (K), max.	610.00

Sources

The Yaws Handbook of Vapor Pressure:	https://www.sciencedirect.com/book/9780128029992/the-yaws-handbook-of-vapor-pressure
Density, Viscosity, Speed of Sound, and Bulk Modulus of Methyl Alkanes, Dimethyl Alkanes, and Hydrotreated Renewable Fuels:	https://www.doi.org/10.1021/je400274f
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C871830&Units=SI
Crippen Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l
McGowan Method:	http://link.springer.com/article/10.1007/BF02311772
Viscosity and Surface Tension of Branched Alkanes 2-Methylnonane and 4-Methylnonane:	https://www.doi.org/10.1021/acs.jced.8b00163
Joback Method:	https://en.wikipedia.org/wiki/Joback_method
Liquid Viscosity and Interfacial Tension of Binary and Ternary Mixtures Containing n-Octacosane by Surface Light Scattering:	https://www.doi.org/10.1021/acs.jced.8b01139
KDB:	https://www.cheric.org/files/research/kdb/mol/mol98.mol
KDB Vapor Pressure Data:	https://www.cheric.org/research/kdb/hcprop/showprop.php?cmpid=98
Crippen Method:	https://www.chemeo.com/doc/models/crippen_log10ws

Legend

af:	Acentric Factor
ap:	Aniline Point
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
hcg:	Heat of Combustion, Gross form
hcn:	Heat of Combustion, Net Form

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
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
rhol:	Liquid Density
rinpol:	Non-polar retention indices
sfust:	Entropy of fusion at a given temperature
sl:	Liquid phase molar entropy at standard conditions
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tf:	Normal melting (fusion) point
tt:	Triple Point Temperature
vc:	Critical Volume
zc:	Critical Compressibility

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