

Butane

Other names:	A 21
	Butanen
	Butani
	DIETHYL
	Freon 600
	HC 600
	HC 600 (hydrocarbon)
	LPG
	Liquefied petroleum gas
	Methylethylmethane
	R 600
	R 600 (alkane)
	UN 1011
	n-Butane
	n-C4H10
Inchi:	InChI=1S/C4H10/c1-3-4-2/h3-4H2,1-2H3
InchiKey:	IJDNQMDRQITEOD-UHFFFAOYSA-N
Formula:	C4H10
SMILES:	CCCC
Mol. weight [g/mol]:	58.12
CAS:	106-97-8

Physical Properties

Property code	Value	Unit	Source
af	0.1990		KDB
aigt	703.71	K	KDB
ap	356.250	K	KDB
chg	-2876.20 ± 0.63	kJ/mol	NIST Webbook
chg	-2878.30 ± 0.63	kJ/mol	NIST Webbook
chg	-2877.50 ± 0.63	kJ/mol	NIST Webbook
dm	0.00	debye	KDB
fil	1.80	% in Air	KDB
flu	8.40	% in Air	KDB
fpo	199.82	K	KDB
gf	-16.10	kJ/mol	KDB
gyrad	2.8890		KDB
hcg	2855.37	kJ/mol	KDB

hcn	2635.334	kJ/mol	KDB
hf	-127.10 ± 0.67	kJ/mol	NIST Webbook
hf	-125.60 ± 0.67	kJ/mol	NIST Webbook
hf	-126.20	kJ/mol	KDB
hfus	6.12	kJ/mol	Joback Method
hvap	22.40	kJ/mol	NIST Webbook
ie	10.35 ± 0.15	eV	NIST Webbook
ie	11.20	eV	NIST Webbook
ie	10.53 ± 0.02	eV	NIST Webbook
ie	10.57	eV	NIST Webbook
ie	10.53 ± 0.10	eV	NIST Webbook
ie	11.20 ± 0.10	eV	NIST Webbook
ie	10.60 ± 0.10	eV	NIST Webbook
ie	10.61	eV	NIST Webbook
ie	10.87 ± 0.05	eV	NIST Webbook
ie	10.89	eV	NIST Webbook
ie	10.67	eV	NIST Webbook
ie	11.09	eV	NIST Webbook
ie	10.50	eV	NIST Webbook
ie	10.55 ± 0.05	eV	NIST Webbook
ie	10.63 ± 0.03	eV	NIST Webbook
ie	10.55 ± 0.05	eV	NIST Webbook
log10ws	-2.57		Estimated Solubility Method
log10ws	-2.72		Aqueous Solubility Prediction Method
logp	1.806		Crippen Method
mcvol	67.220	ml/mol	McGowan Method
nfpaf	%!d(float64=4)		KDB
nfpah	%!d(float64=1)		KDB
pc	3796.00	kPa	KDB
pc	3787.00	kPa	Critical Properties of Three Dimethyl Ether Binary Systems: Dimethyl Ether (RE-170) + Propane (HC-290), Butane (HC-600), and 2-Methyl Propane (HC-600A)
pt	7.00e-04	kPa	NIST Webbook
pt	7.00e-04 ± 8.00e-07	kPa	NIST Webbook
sl	231.00	J/mol×K	NIST Webbook
sl	229.70	J/mol×K	NIST Webbook
sl	226.80	J/mol×K	NIST Webbook
tb	272.60	K	KDB
tc	425.16 ± 0.10	K	NIST Webbook
tc	425.12 ± 0.10	K	NIST Webbook
tc	425.35 ± 0.20	K	NIST Webbook

tc	425.40 ± 0.40	K	NIST Webbook
tc	425.18	K	NIST Webbook
tc	425.37 ± 0.55	K	NIST Webbook
tc	425.40 ± 1.11	K	NIST Webbook
tc	425.16 ± 0.03	K	NIST Webbook
tc	423.90 ± 2.00	K	NIST Webbook
tc	426.35 ± 0.50	K	NIST Webbook
tc	425.12 ± 0.20	K	NIST Webbook
tc	425.10 ± 0.10	K	NIST Webbook
tc	425.16	K	NIST Webbook
tc	425.16 ± 0.07	K	NIST Webbook
tc	424.65 ± 0.50	K	NIST Webbook
tc	425.10 ± 0.10	K	NIST Webbook
tc	424.82	K	Validation of a New Apparatus Using the Dynamic Method for Determining the Critical Properties of Binary Gas/Gas Mixtures
tc	425.12	K	KDB
tc	425.12 ± 0.20	K	NIST Webbook
tc	424.00 ± 1.00	K	NIST Webbook
tf	134.86	K	KDB
tf	135.23	K	Aqueous Solubility Prediction Method
tt	134.86	K	KDB
vc	0.258 ± 0.003	m3/kmol	NIST Webbook
vc	0.255 ± 0.001	m3/kmol	NIST Webbook
vc	0.263 ± 0.010	m3/kmol	NIST Webbook
vc	0.255	m3/kmol	NIST Webbook
vc	0.255	m3/kmol	KDB
zc	0.2738530		KDB
zra	0.27		KDB

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	110.58	J/mol×K	344.90	NIST Webbook
cpg	114.93	J/mol×K	359.60	NIST Webbook
cpg	121.75	J/mol×K	387.50	NIST Webbook
cpg	137.99	J/mol×K	451.60	NIST Webbook
cpg	154.01	J/mol×K	521.00	NIST Webbook
cpg	162.26	J/mol×K	561.30	NIST Webbook

cpg	170.33	J/mol×K	600.80	NIST Webbook
cpg	185.85	J/mol×K	692.60	NIST Webbook
cpl	129.70	J/mol×K	261.80	NIST Webbook
cpl	132.42	J/mol×K	270.00	NIST Webbook
dvisc	0.0012261	Pa×s	160.85	Joback Method
dvisc	0.0006765	Pa×s	186.87	Joback Method
dvisc	0.0004317	Pa×s	212.88	Joback Method
dvisc	0.0003037	Pa×s	238.89	Joback Method
dvisc	0.0002290	Pa×s	264.91	Joback Method
dvisc	0.0001816	Pa×s	290.92	Joback Method
dvisc	0.0027951	Pa×s	134.84	Joback Method
hfust	2.07	kJ/mol	107.60	NIST Webbook
hfust	4.66	kJ/mol	134.90	NIST Webbook
hfust	4.66	kJ/mol	134.90	NIST Webbook
hsubt	35.90	kJ/mol	107.00	NIST Webbook
hvapt	23.90	kJ/mol	234.00	NIST Webbook
hvapt	21.00 ± 0.08	kJ/mol	272.66	NIST Webbook
hvapt	23.10	kJ/mol	242.50	NIST Webbook
hvapt	22.80	kJ/mol	400.00	NIST Webbook
hvapt	22.60	kJ/mol	349.50	NIST Webbook
hvapt	23.20	kJ/mol	297.00	NIST Webbook
hvapt	23.40	kJ/mol	243.50	NIST Webbook
hvapt	22.90	kJ/mol	307.50	NIST Webbook
hvapt	22.44	kJ/mol	272.70	NIST Webbook
hvapt	22.39	kJ/mol	272.05	NIST Webbook
hvapt	22.39	kJ/mol	273.00	KDB
hvapt	27.00	kJ/mol	174.00	NIST Webbook
pvap	479.50	kPa	322.01	Phase equilibrium measurements for systems containing propanenitrile with tert-butyl ethyl ether and C4-hydrocarbons
pvap	2660.00	kPa	403.20	High pressure vapor-liquid equilibria measurements and modeling of butane/ethanol system and isobutane/ethanol system

pvap	280.00	kPa	302.92	Phase equilibrium data for mixtures involving 1,1,2,3,3,3-hexafluoro-1-propene with either propane or n-butane between 312 and 343 K
pvap	324.00	kPa	307.93	Phase equilibrium data for mixtures involving 1,1,2,3,3,3-hexafluoro-1-propene with either propane or n-butane between 312 and 343 K
pvap	377.00	kPa	312.87	Phase equilibrium data for mixtures involving 1,1,2,3,3,3-hexafluoro-1-propene with either propane or n-butane between 312 and 343 K
pvap	432.00	kPa	317.88	Phase equilibrium data for mixtures involving 1,1,2,3,3,3-hexafluoro-1-propene with either propane or n-butane between 312 and 343 K
pvap	491.00	kPa	322.86	Phase equilibrium data for mixtures involving 1,1,2,3,3,3-hexafluoro-1-propene with either propane or n-butane between 312 and 343 K
pvap	561.00	kPa	327.88	Phase equilibrium data for mixtures involving 1,1,2,3,3,3-hexafluoro-1-propene with either propane or n-butane between 312 and 343 K

pvap	632.00	kPa	332.83	Phase equilibrium data for mixtures involving 1,1,2,3,3,3-hexafluoro-1-propene with either propane or n-butane between 312 and 343 K
pvap	714.00	kPa	337.82	Phase equilibrium data for mixtures involving 1,1,2,3,3,3-hexafluoro-1-propene with either propane or n-butane between 312 and 343 K
pvap	804.00	kPa	342.82	Phase equilibrium data for mixtures involving 1,1,2,3,3,3-hexafluoro-1-propene with either propane or n-butane between 312 and 343 K
pvap	897.00	kPa	347.81	Phase equilibrium data for mixtures involving 1,1,2,3,3,3-hexafluoro-1-propene with either propane or n-butane between 312 and 343 K
pvap	1.30e-03	kPa	135.00	Measurement of the (p,.rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter

pvap	2.10e-03	kPa	140.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	9.30e-03	kPa	150.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	0.04	kPa	160.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	0.12	kPa	170.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter

pvap	0.34	kPa	180.00	Measurement of the (p,.rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	0.85	kPa	190.00	Measurement of the (p,.rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	1.94	kPa	200.00	Measurement of the (p,.rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	4.04	kPa	210.00	Measurement of the (p,.rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter

pvap	7.80	kPa	220.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	14.11	kPa	230.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	24.09	kPa	240.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	39.16	kPa	250.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter

pvap	60.99	kPa	260.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	91.50	kPa	270.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	110.67	kPa	275.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	158.31	kPa	285.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter

pvap	187.37	kPa	290.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	257.62	kPa	300.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	346.30	kPa	310.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	456.24	kPa	320.00	Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter

pvap	590.40	kPa	330.00	Measurement of the (p,ρ,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	751.90	kPa	340.00	Measurement of the (p,ρ,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter
pvap	0.42	kPa	182.33	Vapour pressure and excess Gibbs free energy of binary mixtures of hydrogen sulphide with ethane, propane, and n-butane at temperature of 182.33 K
pvap	133.00	kPa	280.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K
pvap	257.50	kPa	300.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K
pvap	456.20	kPa	320.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K

pvap	752.00	kPa	340.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K
pvap	1170.20	kPa	360.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K
pvap	1434.90	kPa	370.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K
pvap	1739.90	kPa	380.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K
pvap	1740.40	kPa	380.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K
pvap	2092.10	kPa	390.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K
pvap	2494.60	kPa	400.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K
pvap	2495.20	kPa	400.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K
pvap	2955.00	kPa	410.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K

pvap	3482.50	kPa	420.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K
pvap	3597.50	kPa	422.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K
pvap	3716.90	kPa	424.00	Measurements of vapour pressures and saturated-liquid densities for n-butane at T = (280 to 424) K
pvap	377.00	kPa	313.15	(Vapour + liquid) equilibria of the {1,1-difluoroethane (HFC-152a) + n-butane (HC-600)} system
pvap	495.00	kPa	323.15	(Vapour + liquid) equilibria of the {1,1-difluoroethane (HFC-152a) + n-butane (HC-600)} system
pvap	638.00	kPa	333.15	(Vapour + liquid) equilibria of the {1,1-difluoroethane (HFC-152a) + n-butane (HC-600)} system
pvap	810.00	kPa	343.15	(Vapour + liquid) equilibria of the {1,1-difluoroethane (HFC-152a) + n-butane (HC-600)} system
pvap	1012.00	kPa	353.15	(Vapour + liquid) equilibria of the {1,1-difluoroethane (HFC-152a) + n-butane (HC-600)} system

pvap	1249.00	kPa	363.15	(Vapour + liquid) equilibria of the {1,1-difluoroethane (HFC-152a) + n-butane (HC-600)} system
pvap	148.00	kPa	283.15	(Vapour + liquid) equilibria of the {trifluoromethane (HFC-23) + propane} and {trifluoromethane (HFC-23) + n-butane} systems
pvap	208.00	kPa	293.15	(Vapour + liquid) equilibria of the {trifluoromethane (HFC-23) + propane} and {trifluoromethane (HFC-23) + n-butane} systems
pvap	282.00	kPa	303.15	(Vapour + liquid) equilibria of the {trifluoromethane (HFC-23) + propane} and {trifluoromethane (HFC-23) + n-butane} systems
pvap	378.00	kPa	313.15	(Vapour + liquid) equilibria of the {trifluoromethane (HFC-23) + propane} and {trifluoromethane (HFC-23) + n-butane} systems
pvap	283.70	kPa	303.15	Isothermal (vapour + liquid) equilibrium measurements and correlation for the {n-butane (R600) + 1,1,1,3,3-pentafluoropropane (R245fa)} system at temperatures from (303.150 to 373.150) K

pvap	496.20	kPa	323.15	Isothermal (vapour + liquid) equilibrium measurements and correlation for the {n-butane (R600) + 1,1,1,3,3-pentafluoropropane (R245fa)} system at temperatures from (303.150 to 373.150) K	
pvap	809.80	kPa	343.15	Isothermal (vapour + liquid) equilibrium measurements and correlation for the {n-butane (R600) + 1,1,1,3,3-pentafluoropropane (R245fa)} system at temperatures from (303.150 to 373.150) K	
pvap	1249.80	kPa	363.15	Isothermal (vapour + liquid) equilibrium measurements and correlation for the {n-butane (R600) + 1,1,1,3,3-pentafluoropropane (R245fa)} system at temperatures from (303.150 to 373.150) K	
pvap	1526.80	kPa	373.15	Isothermal (vapour + liquid) equilibrium measurements and correlation for the {n-butane (R600) + 1,1,1,3,3-pentafluoropropane (R245fa)} system at temperatures from (303.150 to 373.150) K	
pvap	104.00	kPa	273.27	Isothermal Vapor-Liquid Equilibrium Data for the Hexafluoroethane (R116) + n-Butane System at Temperatures from 273 to 323 K	

pvap	177.00	kPa	288.25	Isothermal Vapor-Liquid Equilibrium Data for the Hexafluoroethane (R116) + n-Butane System at Temperatures from 273 to 323 K
pvap	215.00	kPa	294.23	Isothermal Vapor-Liquid Equilibrium Data for the Hexafluoroethane (R116) + n-Butane System at Temperatures from 273 to 323 K
pvap	231.00	kPa	296.23	Isothermal Vapor-Liquid Equilibrium Data for the Hexafluoroethane (R116) + n-Butane System at Temperatures from 273 to 323 K
pvap	332.00	kPa	308.21	Isothermal Vapor-Liquid Equilibrium Data for the Hexafluoroethane (R116) + n-Butane System at Temperatures from 273 to 323 K
pvap	498.00	kPa	323.19	Isothermal Vapor-Liquid Equilibrium Data for the Hexafluoroethane (R116) + n-Butane System at Temperatures from 273 to 323 K
pvap	148.10	kPa	283.15	Vapor-Liquid Equilibrium Measurements for 2,3,3,3-Tetrafluoroprop-1-ene + Butane at Temperatures from 283.15 to 323.15 K

pvap	207.20	kPa	293.15	Vapor-Liquid Equilibrium Measurements for 2,3,3,3-Tetrafluoroprop-1-ene + Butane at Temperatures from 283.15 to 323.15 K
pvap	283.40	kPa	303.15	Vapor-Liquid Equilibrium Measurements for 2,3,3,3-Tetrafluoroprop-1-ene + Butane at Temperatures from 283.15 to 323.15 K
pvap	378.60	kPa	313.15	Vapor-Liquid Equilibrium Measurements for 2,3,3,3-Tetrafluoroprop-1-ene + Butane at Temperatures from 283.15 to 323.15 K
pvap	496.50	kPa	323.15	Vapor-Liquid Equilibrium Measurements for 2,3,3,3-Tetrafluoroprop-1-ene + Butane at Temperatures from 283.15 to 323.15 K
pvap	26.20	kPa	240.00	Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)
pvap	23.90	kPa	240.00	Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)
pvap	59.90	kPa	260.00	Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)
pvap	131.50	kPa	280.00	Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)

pvap	256.40	kPa	300.00	Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)
pvap	454.80	kPa	320.00	Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)
pvap	1525.00	kPa	373.20	High pressure vapor-liquid equilibria measurements and modeling of butane/ethanol system and isobutane/ethanol system
pvap	751.00	kPa	340.00	Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)
pvap	1168.50	kPa	360.00	Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)
pvap	1168.10	kPa	360.00	Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)
pvap	1737.40	kPa	380.00	Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)
pvap	378.00	kPa	313.15	Vapor-Liquid Equilibria of the Binary n-Butane (HC-600) + Difluoromethane (HFC-32), + Pentafluoroethane (HFC-125), + 1,1,1,2-Tetrafluoroethane (HFC-134a) Mixture Systems

pvap	496.00	kPa	323.15	Vapor-Liquid Equilibria of the Binary n-Butane (HC-600) + Difluoromethane (HFC-32), + Pentafluoroethane (HFC-125), + 1,1,1,2-Tetrafluoroethane (HFC-134a) Mixture Systems
pvap	638.00	kPa	333.15	Vapor-Liquid Equilibria of the Binary n-Butane (HC-600) + Difluoromethane (HFC-32), + Pentafluoroethane (HFC-125), + 1,1,1,2-Tetrafluoroethane (HFC-134a) Mixture Systems
pvap	69.60	kPa	263.15	Vapor-Liquid Equilibrium for the Difluoromethane (R32) + n-Butane (R600) System
pvap	125.10	kPa	278.15	Vapor-Liquid Equilibrium for the Difluoromethane (R32) + n-Butane (R600) System
pvap	209.40	kPa	293.15	Vapor-Liquid Equilibrium for the Difluoromethane (R32) + n-Butane (R600) System
pvap	592.44	kPa	330.16	Vapor-Liquid Equilibrium for 1-Propanol + 1-Butene, + cis-2-Butene, + 2-Methyl-propene, + trans-2-Butene, + n-Butane, and + 2-Methyl-propane
pvap	1284.50	kPa	364.51	Vapor Liquid Equilibrium for Six Binary Systems of C4-Hydrocarbons + 2-Propanone
pvap	377.00	kPa	313.15	Vapor-Liquid Equilibria of the 1,1,1-Trifluoroethane + n-Butane System

pvap	495.00	kPa	323.15	Vapor-Liquid Equilibria of the 1,1,1-Trifluoroethane + n-Butane System
pvap	639.00	kPa	333.15	Vapor-Liquid Equilibria of the 1,1,1-Trifluoroethane + n-Butane System
pvap	810.00	kPa	343.15	Vapor-Liquid Equilibria of the 1,1,1-Trifluoroethane + n-Butane System
pvap	1012.00	kPa	353.15	Vapor-Liquid Equilibria of the 1,1,1-Trifluoroethane + n-Butane System
pvap	1250.00	kPa	363.15	Vapor-Liquid Equilibria of the 1,1,1-Trifluoroethane + n-Butane System
pvap	328.80	kPa	308.15	Vapor-Liquid Equilibrium for Thiophene + Butane, + trans-But-2-ene, + 2-Methylpropane, and + 2-Methylpropene
pvap	679.30	kPa	335.60	Vapor-Liquid Equilibrium for Thiophene + Butane, + trans-But-2-ene, + 2-Methylpropane, and + 2-Methylpropene
pvap	677.90	kPa	335.60	Vapor-Liquid Equilibrium for Thiophene + Butane, + trans-But-2-ene, + 2-Methylpropane, and + 2-Methylpropene

pvap	951.70	kPa	350.36	Vapor-Liquid Equilibrium for Dimethyl Disulfide + Butane, + trans-But-2-ene, + 2-Methylpropane, + 2-Methylpropene, + Ethanol, and 2-Ethoxy-2-methylpropane
pvap	29.10	kPa	243.03	Phase Equilibria of H ₂ S-Hydrocarbons (Propane, n-Butane, and n-Pentane) Binary Systems at Low Temperatures
pvap	210.80	kPa	293.38	Phase Equilibria of H ₂ S-Hydrocarbons (Propane, n-Butane, and n-Pentane) Binary Systems at Low Temperatures
pvap	103.40	kPa	273.15	Vapor-Liquid Equilibria for the 1,1,1,2-Tetrafluoroethane (HFC-134a) + n-Butane (R-600) System
pvap	149.00	kPa	283.15	Vapor-Liquid Equilibria for the 1,1,1,2-Tetrafluoroethane (HFC-134a) + n-Butane (R-600) System
pvap	208.30	kPa	293.15	Vapor-Liquid Equilibria for the 1,1,1,2-Tetrafluoroethane (HFC-134a) + n-Butane (R-600) System
pvap	284.00	kPa	303.15	Vapor-Liquid Equilibria for the 1,1,1,2-Tetrafluoroethane (HFC-134a) + n-Butane (R-600) System
pvap	378.10	kPa	313.15	Vapor-Liquid Equilibria for the 1,1,1,2-Tetrafluoroethane (HFC-134a) + n-Butane (R-600) System

pvap	493.10	kPa	323.15	Vapor-Liquid Equilibria for the 1,1,1,2-Tetrafluoroethane (HFC-134a) + n-Butane (R-600) System
pvap	495.00	kPa	323.12	Vapor Liquid Equilibrium for Butane + Methanol, + Ethanol, + 2-Propanol, + 2-Butanol, and + 2-Methyl-2-Propanol (TBA) at 323 K
pvap	495.30	kPa	323.13	Vapor Liquid Equilibrium for Butane + Methanol, + Ethanol, + 2-Propanol, + 2-Butanol, and + 2-Methyl-2-Propanol (TBA) at 323 K
pvap	495.60	kPa	323.15	Vapor Liquid Equilibrium for Butane + Methanol, + Ethanol, + 2-Propanol, + 2-Butanol, and + 2-Methyl-2-Propanol (TBA) at 323 K
pvap	495.70	kPa	323.15	Vapor Liquid Equilibrium for Butane + Methanol, + Ethanol, + 2-Propanol, + 2-Butanol, and + 2-Methyl-2-Propanol (TBA) at 323 K
pvap	104.00	kPa	273.15	Vapor-Liquid Equilibria for 1,1,1,2,3,3,3-Heptafluoropropane (HFC-227ea) + Butane (R600) at Various Temperatures
pvap	150.00	kPa	283.15	Vapor-Liquid Equilibria for 1,1,1,2,3,3,3-Heptafluoropropane (HFC-227ea) + Butane (R600) at Various Temperatures
pvap	208.00	kPa	293.15	Vapor-Liquid Equilibria for 1,1,1,2,3,3,3-Heptafluoropropane (HFC-227ea) + Butane (R600) at Various Temperatures

pvap	284.00	kPa	303.15	Vapor-Liquid Equilibria for 1,1,1,2,3,3,3-Heptafluoropropane (HFC-227ea) + Butane (R600) at Various Temperatures
pvap	378.00	kPa	313.15	Vapor-Liquid Equilibria for 1,1,1,2,3,3,3-Heptafluoropropane (HFC-227ea) + Butane (R600) at Various Temperatures
pvap	494.00	kPa	323.15	Vapor-Liquid Equilibria for 1,1,1,2,3,3,3-Heptafluoropropane (HFC-227ea) + Butane (R600) at Various Temperatures
pvap	104.00	kPa	273.15	Vapor-Liquid Equilibria for the Binary System of 1,1,1-Trifluoroethane (HFC-143a) + Butane (R600) at Various Temperatures
pvap	150.00	kPa	283.15	Vapor-Liquid Equilibria for the Binary System of 1,1,1-Trifluoroethane (HFC-143a) + Butane (R600) at Various Temperatures
pvap	208.00	kPa	293.15	Vapor-Liquid Equilibria for the Binary System of 1,1,1-Trifluoroethane (HFC-143a) + Butane (R600) at Various Temperatures
pvap	284.00	kPa	303.15	Vapor-Liquid Equilibria for the Binary System of 1,1,1-Trifluoroethane (HFC-143a) + Butane (R600) at Various Temperatures
pvap	378.00	kPa	313.15	Vapor-Liquid Equilibria for the Binary System of 1,1,1-Trifluoroethane (HFC-143a) + Butane (R600) at Various Temperatures

pvap	494.00	kPa	323.15	Vapor-Liquid Equilibria for the Binary System of 1,1,1-Trifluoroethane (HFC-143a) + Butane (R600) at Various Temperatures
pvap	103.00	kPa	273.15	Vapor-Liquid Equilibria for Propane (R290) + n-Butane (R600) at Various Temperatures
pvap	149.00	kPa	283.15	Vapor-Liquid Equilibria for Propane (R290) + n-Butane (R600) at Various Temperatures
pvap	208.00	kPa	293.15	Vapor-Liquid Equilibria for Propane (R290) + n-Butane (R600) at Various Temperatures
pvap	284.00	kPa	303.15	Vapor-Liquid Equilibria for Propane (R290) + n-Butane (R600) at Various Temperatures
pvap	378.00	kPa	313.15	Vapor-Liquid Equilibria for Propane (R290) + n-Butane (R600) at Various Temperatures
pvap	493.00	kPa	323.15	Vapor-Liquid Equilibria for Propane (R290) + n-Butane (R600) at Various Temperatures
pvap	436.20	kPa	318.35	Vapor-Liquid Equilibrium for 1-Butanol + 1-Butene at (318.4 and 364.5) K and Vapor-Liquid Equilibrium of 1-Butanol + 2-Methylpropane, + n-Butane and 1-Butene + 2-Methylpropane at 318.4 K

pvap	1039.00	kPa	353.15	In Situ Determination of Phase Equilibria of Methyl Benzoate + Alkane Mixtures Using an Infrared Absorption Method. Comparison with Polar GC-SAFT Predictions
pvap	1586.00	kPa	373.15	In Situ Determination of Phase Equilibria of Methyl Benzoate + Alkane Mixtures Using an Infrared Absorption Method. Comparison with Polar GC-SAFT Predictions
pvap	2265.00	kPa	393.15	In Situ Determination of Phase Equilibria of Methyl Benzoate + Alkane Mixtures Using an Infrared Absorption Method. Comparison with Polar GC-SAFT Predictions
pvap	3156.00	kPa	413.15	In Situ Determination of Phase Equilibria of Methyl Benzoate + Alkane Mixtures Using an Infrared Absorption Method. Comparison with Polar GC-SAFT Predictions
pvap	1013.00	kPa	353.20	High pressure vapor-liquid equilibria measurements and modeling of butane/ethanol system and isobutane/ethanol system

pvap	881.70	kPa	346.97	Vapor-Liquid Equilibrium for Tetrahydrothiophene + n-Butane, + trans-2-Butene, + 2-Methylpropane, and + 2-Methylpropene
pvap	645.00	kPa	333.20	High pressure vapor-liquid equilibria measurements and modeling of butane/ethanol system and isobutane/ethanol system
pvap	379.00	kPa	313.20	High pressure vapor-liquid equilibria measurements and modeling of butane/ethanol system and isobutane/ethanol system
pvap	426.80	kPa	317.60	Vapour liquid equilibrium for the systems diethyl sulphide + 1-butene, +cis-2-butene, +2-methylpropane, +2-methylpropene, +n-butane, +trans-2-butene
pvap	425.70	kPa	317.47	Isothermal binary vapour liquid equilibrium for butanes and butenes with dimethylsulphide
pvap	495.00	kPa	323.15	Vapor liquid equilibria for the binary system of 1,1-difluoroethane (HFC-152a) + n-butane (R-600) at various temperatures
pvap	378.00	kPa	313.15	Vapor liquid equilibria for the binary system of 1,1-difluoroethane (HFC-152a) + n-butane (R-600) at various temperatures

pvap	284.00	kPa	303.15	Vapor liquid equilibria for the binary system of 1,1-difluoroethane (HFC-152a) + n-butane (R-600) at various temperatures
pvap	208.00	kPa	293.15	Vapor liquid equilibria for the binary system of 1,1-difluoroethane (HFC-152a) + n-butane (R-600) at various temperatures
pvap	150.00	kPa	283.15	Vapor liquid equilibria for the binary system of 1,1-difluoroethane (HFC-152a) + n-butane (R-600) at various temperatures
pvap	104.00	kPa	273.15	Vapor liquid equilibria for the binary system of 1,1-difluoroethane (HFC-152a) + n-butane (R-600) at various temperatures
pvap	436.55	kPa	318.40	Vapour liquid equilibrium for the ethyl ethanoate + 1-butene, +cis-2-butene, +trans-2-butene, +2-methylpropene, +n-butane and +2-methylpropane
pvap	750.50	kPa	340.00	Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)
pvap	437.50	kPa	318.35	Vapor-Liquid Equilibrium for Tetrahydrothiophene + n-Butane, + trans-2-Butene, + 2-Methylpropane, and + 2-Methylpropene
rfi	1.32920		298.15	KDB
rhol	579.00	kg/m3	293.00	KDB
sfust	19.06	J/mol×K	107.60	NIST Webbook
sfust	34.56	J/mol×K	134.90	NIST Webbook

srf	0.01	N/m	303.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	328.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	333.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	338.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	343.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	348.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	353.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point

srf	0.01	N/m	358.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.00	N/m	363.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.00	N/m	368.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	298.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.00	N/m	378.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.00	N/m	383.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.00	N/m	388.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point

srf	0.00	N/m	393.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.00	N/m	398.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.00	N/m	403.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	9.23e-04	N/m	408.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	5.83e-04	N/m	413.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	3.41e-04	N/m	417.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	1.86e-04	N/m	419.75	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point

srf	1.57e-04	N/m	420.35	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	1.29e-04	N/m	420.85	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	1.18e-04	N/m	421.08	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	1.00e-04	N/m	421.48	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	8.10e-05	N/m	421.88	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	6.40e-05	N/m	422.28	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	5.10e-05	N/m	422.63	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point

srf	3.60e-05	N/m	423.04	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	293.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	288.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	283.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	323.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	318.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	313.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point

srf	0.01	N/m	308.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	278.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
srf	0.01	N/m	293.20	KDB
srf	0.00	N/m	373.15	Capillary constant and surface tension of dimethyl ether and n-butane at temperatures from 214 K to those close to the critical point
svapt	82.30	J/mol×K	272.05	NIST Webbook

Correlations

Information	Value
Property code	pvap
Equation	$\ln(P_{vp}) = A + B/(T + C)$
Coeff. A	1.41240e+01
Coeff. B	-2.35413e+03
Coeff. C	-2.50050e+01
Temperature range (K), min.	195.15
Temperature range (K), max.	292.14

Information	Value
Property code	pvap
Equation	$\ln(P_{vp}) = A + B/T + C*\ln(T) + D*T^2$
Coeff. A	5.87029e+01
Coeff. B	-4.34663e+03
Coeff. C	-6.92229e+00
Coeff. D	9.15271e-06

Temperature range (K), min.	134.86
Temperature range (K), max.	425.18

Datasets

Viscosity, Pa*s

Temperature, K - Liquid	Pressure, kPa - Liquid	Viscosity, Pa*s - Liquid
273.15	100.00	0.0002030
273.15	10000.00	0.0002250
273.15	20000.00	0.0002470
273.15	30000.00	0.0002690
293.15	200.00	0.0001700
293.15	10000.00	0.0001840
293.15	20000.00	0.0002090
293.15	30000.00	0.0002320
313.15	400.00	0.0001430
313.15	10000.00	0.0001600
313.15	20000.00	0.0001840
313.15	30000.00	0.0002020
333.15	600.00	0.0001180
333.15	10000.00	0.0001330
333.15	20000.00	0.0001530
333.15	30000.00	0.0001720

Reference

<https://www.doi.org/10.1007/s10765-006-0053-2>

Mass density, kg/m3

Temperature, K - Fluid (supercritical or subcritical phases)	Pressure, kPa - Fluid (supercritical or subcritical phases)	Mass density, kg/m3 - Fluid (supercritical or subcritical phases)
360.00	200000.00	676.57
360.00	180000.00	668.57
360.00	160000.00	659.24
360.00	140000.00	649.66
360.00	120000.00	638.57

360.00	100000.00	626.29
360.00	90000.00	619.58
360.00	80000.00	612.02
360.00	70000.00	604.19
360.00	60000.00	595.41
360.00	50000.00	585.47
400.00	200000.00	658.6
400.00	180000.00	649.69
400.00	160000.00	639.75
400.00	140000.00	629.05
400.00	120000.00	617.0
400.00	100000.00	603.28
400.00	90000.00	595.58
400.00	80000.00	587.28
400.00	70000.00	578.11
400.00	60000.00	567.8
400.00	50000.00	556.11
440.00	200000.00	641.85
440.00	180000.00	632.12
440.00	160000.00	621.49
440.00	140000.00	609.84
440.00	120000.00	596.67
440.00	100000.00	581.43
440.00	90000.00	572.93
440.00	80000.00	563.51
440.00	70000.00	552.99
440.00	60000.00	541.19
440.00	50000.00	527.49
500.00	200000.00	617.68
500.00	180000.00	607.21
500.00	160000.00	595.57
500.00	140000.00	582.51
500.00	120000.00	567.64
500.00	100000.00	550.18
500.00	90000.00	540.26
500.00	80000.00	529.24
500.00	70000.00	517.01
500.00	60000.00	502.86
500.00	50000.00	485.76
550.00	200000.00	599.35
550.00	180000.00	588.11
550.00	160000.00	575.61
550.00	140000.00	561.8
550.00	120000.00	545.49

550.00	100000.00	526.47
550.00	90000.00	515.43
550.00	80000.00	503.05
550.00	70000.00	489.04
550.00	60000.00	472.65
550.00	50000.00	452.74
600.00	200000.00	582.23
600.00	180000.00	570.23
600.00	160000.00	556.81
600.00	140000.00	541.56
600.00	120000.00	524.18
600.00	100000.00	503.41
600.00	90000.00	491.53
600.00	80000.00	477.92
600.00	70000.00	462.25
600.00	60000.00	444.04
600.00	50000.00	421.67

Reference

<https://www.doi.org/10.1007/s10765-012-1383-x>

Temperature, K	Pressure, kPa	Mass density, kg/m3
280.00	1000.00	595.47
280.00	2000.00	596.86
280.00	3000.00	598.22
280.00	5000.00	600.88
280.00	10000.00	607.05
280.00	20000.00	617.68
280.00	30000.00	626.91
280.00	40000.00	635.29
280.00	50000.00	642.77
280.00	60000.00	649.44
280.00	70000.00	655.79
280.00	80000.00	661.73
280.00	90000.00	667.23
280.00	100000.00	672.51
280.00	120000.00	682.08
280.00	140000.00	690.89
280.00	160000.00	698.82
280.00	180000.00	706.38
280.00	200000.00	713.34
300.00	1000.00	572.94
300.00	2000.00	574.58
300.00	3000.00	576.27

300.00	5000.00	579.56
300.00	10000.00	586.77
300.00	20000.00	599.44
300.00	30000.00	610.13
300.00	40000.00	619.89
300.00	50000.00	628.14
300.00	60000.00	635.82
300.00	70000.00	642.36
300.00	80000.00	648.71
300.00	90000.00	654.83
300.00	100000.00	660.41
300.00	120000.00	670.68
300.00	140000.00	680.05
300.00	160000.00	688.48
300.00	180000.00	696.25
300.00	200000.00	703.51
320.00	1000.00	548.24
320.00	2000.00	550.53
320.00	3000.00	552.73
320.00	5000.00	556.84
320.00	10000.00	566.09
320.00	20000.00	580.87
320.00	30000.00	593.19
320.00	40000.00	603.68
320.00	50000.00	612.97
320.00	60000.00	621.23
320.00	70000.00	628.85
320.00	80000.00	635.85
320.00	90000.00	642.47
320.00	100000.00	648.38
320.00	120000.00	659.38
320.00	140000.00	669.21
320.00	160000.00	678.31
320.00	180000.00	686.49
320.00	200000.00	694.12
340.00	1000.00	521.26
340.00	2000.00	524.21
340.00	3000.00	527.06
340.00	5000.00	532.46
340.00	10000.00	544.06
340.00	20000.00	561.99
340.00	30000.00	576.2
340.00	40000.00	588.27
340.00	50000.00	598.47

340.00	60000.00	607.64
340.00	70000.00	615.81
340.00	80000.00	623.32
340.00	90000.00	630.37
340.00	100000.00	636.58
340.00	120000.00	648.45
340.00	140000.00	658.64
340.00	160000.00	668.16
340.00	180000.00	676.9
340.00	200000.00	684.85
360.00	2000.00	494.28
360.00	3000.00	498.49
360.00	5000.00	505.91
360.00	10000.00	520.98
360.00	20000.00	542.91
360.00	30000.00	559.24
360.00	40000.00	572.58
360.00	50000.00	584.17
360.00	60000.00	593.9
360.00	70000.00	602.93
360.00	80000.00	610.9
360.00	90000.00	618.47
360.00	100000.00	625.39
360.00	120000.00	637.62
360.00	140000.00	648.76
360.00	160000.00	658.47
360.00	180000.00	667.68
360.00	200000.00	676.03
380.00	2000.00	456.63
380.00	3000.00	463.53
380.00	5000.00	474.94
380.00	10000.00	495.21
380.00	20000.00	522.42
380.00	30000.00	541.49
380.00	40000.00	556.53
380.00	50000.00	569.05
380.00	60000.00	580.01
380.00	70000.00	589.59
380.00	80000.00	598.34
380.00	90000.00	606.19
380.00	100000.00	613.44
380.00	120000.00	626.58
380.00	140000.00	638.25
380.00	160000.00	648.59

380.00	180000.00	658.14
380.00	200000.00	666.86

Reference

<https://www.doi.org/10.1016/j.jct.2006.09.003>

Pressure, kPa	Temperature, K	Mass density, kg/m3
3000.00	380.00	463.27
5000.00	380.00	474.65
5000.00	400.00	437.19
10000.00	380.00	494.93
10000.00	400.00	466.97
10000.00	420.00	436.16
10000.00	440.00	401.28
20000.00	380.00	521.9
20000.00	400.00	500.93
20000.00	420.00	479.15
20000.00	440.00	457.43
30000.00	400.00	522.83
30000.00	420.00	504.89
30000.00	440.00	487.23
40000.00	380.00	555.85
40000.00	400.00	539.73
40000.00	420.00	523.9
40000.00	440.00	508.57
50000.00	400.00	553.54
50000.00	420.00	539.08
50000.00	440.00	525.26
60000.00	380.00	579.32
60000.00	400.00	565.44
60000.00	420.00	551.8
60000.00	440.00	539.13
70000.00	400.00	575.77
70000.00	420.00	563.07
70000.00	440.00	551.03
80000.00	380.00	597.57
80000.00	400.00	585.08
80000.00	420.00	572.94
80000.00	440.00	561.56
90000.00	400.00	593.33
90000.00	420.00	581.86
90000.00	440.00	571.14
100000.00	380.00	612.79
100000.00	400.00	601.18

100000.00	420.00	589.89
100000.00	440.00	579.66
120000.00	380.00	625.93
120000.00	400.00	614.9
120000.00	420.00	604.27
120000.00	440.00	594.85
140000.00	380.00	637.29
140000.00	400.00	627.05
140000.00	420.00	617.11
140000.00	440.00	608.04
160000.00	380.00	647.82
160000.00	400.00	637.77
160000.00	420.00	628.25
160000.00	440.00	619.73
180000.00	380.00	657.28
180000.00	400.00	647.6
180000.00	420.00	638.65
180000.00	440.00	630.34
200000.00	380.00	665.98
200000.00	400.00	656.49
200000.00	420.00	647.73
200000.00	440.00	639.98

Reference

<https://www.doi.org/10.1016/j.jct.2007.06.014>

Temperature, K	Pressure, kPa	Mass density, kg/m3
298.12	221.39	5.5728
298.12	221.35	5.5716
298.14	196.75	4.9091
298.14	196.77	4.9096
298.14	175.29	4.3414
298.14	175.29	4.3415
298.11	162.81	4.0157
298.11	162.82	4.016
298.12	142.16	3.4823
298.13	142.17	3.4826
298.13	123.43	3.0049
298.13	123.44	3.0052
298.14	102.90	2.4887
298.14	102.91	2.4889
298.14	82.37	1.9794
298.14	82.38	1.9797
298.14	61.79	1.4756

298.14	61.80	1.4758
298.15	57.18	1.3635
298.15	57.18	1.3636
322.98	450.39	11.024
323.00	450.69	11.032
323.01	450.89	11.037
323.06	392.10	9.426
323.08	392.50	9.4391
323.09	392.90	9.4492
323.11	380.78	9.1236
323.11	380.74	9.1236
323.12	380.76	9.1272
323.12	330.12	7.8092
323.12	330.36	7.8164
323.13	330.63	7.8215
323.13	301.54	7.0807
323.13	303.39	7.1241
323.13	305.32	7.1762
323.13	261.18	6.0223
323.13	261.21	6.023
323.14	261.28	6.0252
323.14	215.87	4.9169
323.14	215.65	4.9111
323.14	215.63	4.9096
323.14	184.24	4.1645
323.15	184.35	4.1652
323.15	184.36	4.1667
323.15	150.03	3.3622
323.15	150.04	3.3622
323.14	132.43	2.9506
323.14	132.44	2.9492
323.14	132.46	2.9499
323.14	112.93	2.5057
323.14	112.94	2.5035
323.14	112.96	2.5057
323.14	90.51	1.9979
323.14	90.52	1.9986
323.14	66.38	1.4575
323.14	66.38	1.4567
323.14	66.39	1.4553
323.14	58.20	1.2744
323.14	58.20	1.2766
323.14	58.21	1.2766
348.03	813.99	19.581

348.03	814.13	19.586
348.03	813.85	19.576
348.13	760.25	17.999
348.13	760.34	18.002
348.12	677.52	15.682
348.12	677.82	15.691
348.14	618.24	14.097
348.14	618.34	14.099
348.15	516.76	11.497
348.15	516.69	11.497
348.15	454.98	9.9811
348.15	455.21	9.9833
348.15	340.91	7.3031
348.15	338.38	7.2445
348.15	337.86	7.2315
348.15	337.88	7.2315
348.14	293.19	6.2173
348.14	293.73	6.2296
348.14	93.82	1.9124
348.14	93.83	1.9131
348.15	63.28	1.2845
348.15	63.30	1.286
373.15	1366.40	33.46
373.15	1367.10	33.484
373.14	1262.70	30.019
373.14	1263.00	30.031
373.14	1095.40	24.953
373.14	1095.50	24.958
373.13	916.45	20.053
373.13	916.45	20.052
373.14	838.34	18.049
373.15	750.55	15.881
373.14	751.04	15.893
373.14	669.81	13.955
373.14	670.00	13.959
373.14	572.54	11.724
373.14	572.60	11.728
373.14	493.81	9.9744
373.14	493.67	9.9707
373.15	439.63	8.8018
373.15	441.23	8.8343
373.15	392.71	7.8028
373.15	344.33	6.7909
373.15	344.35	6.7909

373.14	273.38	5.3326
373.14	274.72	5.3593
373.15	210.37	4.0602
373.14	210.39	4.0609
373.14	157.75	3.0215
373.13	157.77	3.0215
373.13	106.93	2.0348
373.13	106.95	2.0363
373.13	106.98	2.037
373.14	57.69	1.0901
373.14	57.72	1.0901
373.14	57.76	1.0909
423.48	3280.80	96.642
423.47	3280.90	96.663
424.21	3176.80	88.401
424.21	3177.00	88.415
423.28	3171.40	89.266
423.20	3170.20	89.28
423.19	3006.00	79.774
423.20	3005.80	79.773
423.20	2781.60	69.058
423.20	2781.10	69.059
423.11	2532.50	59.203
423.12	2534.00	59.251
423.13	2535.60	59.303
423.17	2272.30	50.31
423.17	1490.20	29.071
423.19	1490.00	29.063
423.24	1016.10	18.65
423.25	1015.90	18.648
423.26	884.12	15.981
423.26	884.38	15.987
423.20	653.48	11.519
423.19	654.26	11.533
423.17	452.37	7.8076
423.17	450.91	7.7808
423.16	195.54	3.2893
423.16	195.59	3.2893
428.14	30023.00	498.21
428.14	30022.00	498.2
428.14	30018.00	498.2
428.21	22974.00	480.02
428.21	22974.00	480.02
428.20	22973.00	480.02

428.15	17077.00	460.12
428.15	17075.00	460.12
428.15	12773.00	440.28
428.16	12732.00	440.05
428.16	12735.00	440.06
428.16	9661.10	420.21
428.16	9662.30	420.22
428.17	7466.20	399.67
428.16	7467.10	399.68
428.16	7467.50	399.69
428.13	5948.90	378.0
428.13	5949.60	378.01
428.13	5949.60	378.02
428.09	5150.20	360.25
428.09	5149.90	360.26
428.10	4625.90	341.66
428.11	4626.60	341.66
428.11	4626.80	341.65
428.18	4312.00	322.22
428.18	4312.40	322.24
428.18	4312.40	322.25
428.14	4145.90	304.6
428.14	4146.20	304.61
428.15	4067.30	289.0
428.15	4067.50	288.98
428.20	4030.00	274.89
428.20	4030.10	274.9
428.13	3990.10	251.58
428.13	3990.10	251.63
428.12	3984.80	246.5
428.12	3984.90	246.49
428.18	3976.30	230.48
428.17	3976.10	230.45
428.12	3964.90	218.37
428.13	3964.80	218.33
428.19	3953.50	199.12
428.18	3953.30	199.18
428.19	3938.70	185.24
428.19	3939.20	185.3
428.19	3884.10	159.21
428.19	3883.80	159.22
428.34	3805.10	138.83
428.39	3806.50	138.8
428.20	3793.80	137.58

428.18	3790.90	137.62
428.13	3655.20	119.22
428.14	3655.70	119.23
428.14	3427.10	99.322
428.15	3427.20	99.316
428.16	3263.80	88.856
428.15	3263.70	88.854
428.23	3108.60	80.486
428.22	3107.80	80.455
428.14	2862.80	69.471
428.13	2862.90	69.476
428.13	2624.70	60.36
428.13	2624.60	60.353
428.12	2306.20	49.889
428.12	2306.20	49.887
428.10	1964.10	40.163
428.11	1964.30	40.167
428.21	1539.80	29.634
428.21	1540.10	29.642
428.18	1098.50	20.025
428.18	1099.10	20.038
428.15	1040.70	18.847
428.14	1041.20	18.856
428.11	904.86	16.141
428.10	904.90	16.138
428.10	796.14	14.038
428.10	796.19	14.041
428.12	685.03	11.939
428.13	684.54	11.929
428.13	578.67	9.9774
428.14	578.76	9.9803
428.13	480.91	8.2126
428.14	480.81	8.2112
428.09	194.34	3.2308
428.08	194.36	3.2322
428.11	131.61	2.1741
428.11	131.64	2.1741
428.18	62.10	1.0176
428.17	62.10	1.0183
428.16	62.10	1.0176
448.15	29472.00	478.91
448.14	29460.00	478.91
448.17	23154.00	460.09
448.16	23152.00	460.08

448.14	18184.00	440.74
448.14	18187.00	440.74
448.15	14319.00	420.46
448.17	14321.00	420.46
448.15	11528.00	400.23
448.15	11529.00	400.23
448.17	9538.60	380.13
448.17	9537.40	380.12
448.16	8140.60	359.99
448.16	8139.40	359.98
448.14	7191.00	340.37
448.13	7189.80	340.36
448.16	6551.40	321.12
448.16	6551.10	321.12
448.11	6144.80	304.18
448.11	6145.00	304.17
448.28	5785.10	281.66
448.27	5784.60	281.65
448.15	5551.90	263.05
448.15	5553.70	263.02
448.18	5346.70	240.34
448.17	5346.60	240.34
448.13	5203.20	222.02
448.13	5203.50	222.03
448.11	5054.80	201.47
448.11	5054.50	201.47
448.09	4846.20	174.16
448.13	4847.00	174.1
448.23	4727.10	160.07
448.23	4727.00	160.07
448.17	4498.30	138.72
448.18	4498.10	138.68
448.13	4161.60	114.81
448.13	4161.60	114.81
448.18	3747.80	92.905
448.19	3747.90	92.91
448.18	3433.90	79.739
448.18	3433.70	79.735
448.15	3073.30	66.943
448.16	3073.30	66.941
448.16	2511.80	50.321
448.16	2512.10	50.329
448.17	2073.00	39.287
448.16	2073.70	39.305

448.16	1662.20	30.086
448.15	1661.90	30.078
448.17	1158.40	19.932
448.17	1158.40	19.932
448.16	807.76	13.456
448.15	807.60	13.453
448.15	618.60	10.141
448.15	618.43	10.135
448.16	508.50	8.2591
448.16	509.69	8.28
448.16	430.17	6.9362
448.16	431.02	6.95
448.15	220.17	3.4915
448.16	220.38	3.4965

Reference

<https://www.doi.org/10.1021/acs.jced.5b00654>

Speed of sound, m/s

Temperature, K - Liquid	Pressure, kPa - Liquid	Speed of sound, m/s - Liquid
200.00	1101.43	1447.79
200.00	2102.08	1453.53
200.00	3102.76	1459.25
200.00	4103.47	1464.89
200.00	5104.18	1470.49
200.00	6105.13	1476.03
200.00	7105.88	1481.53
200.00	8106.60	1486.99
200.00	9107.34	1492.39
200.00	10108.00	1497.75
200.00	12609.80	1510.92
200.00	15111.60	1523.84
200.00	17613.40	1536.5
200.00	20115.20	1548.92
200.00	25118.80	1573.08
200.00	30122.60	1596.41
200.00	35126.20	1618.97
199.99	40128.50	1640.8
199.99	45132.10	1662.03
199.99	50135.60	1682.63
200.00	60142.70	1722.21

200.00	70149.80	1759.84
200.00	80156.90	1795.79
200.00	90164.00	1830.15
200.00	100171.00	1863.22
201.00	250.62	1437.19
201.00	600.55	1439.24
201.00	1100.47	1442.14
201.00	1101.45	1442.16
201.00	2101.94	1447.96
201.00	2102.01	1447.96
201.00	3102.62	1453.68
201.00	4103.38	1459.38
201.00	5104.04	1465.01
220.00	249.98	1330.46
220.00	599.68	1332.78
220.00	1100.72	1336.09
220.00	1100.82	1336.09
220.00	10107.00	1392.58
220.00	12608.80	1407.34
220.00	15110.60	1421.75
220.00	17612.40	1435.83
220.00	2101.56	1342.65
220.00	2101.82	1342.65
220.00	2102.10	1342.65
220.00	2103.43	1342.64
220.00	3102.31	1349.14
220.00	3104.10	1349.13
220.00	4103.01	1355.55
220.00	4104.72	1355.54
220.00	5103.60	1361.88
220.00	6104.22	1368.15
220.00	7104.87	1374.34
220.00	8105.49	1380.51
220.00	9106.16	1386.56
220.00	20114.20	1449.59
220.00	25117.70	1476.25
220.00	30121.30	1501.85
220.00	35124.90	1526.52
220.00	40129.10	1550.28
220.00	45132.70	1573.31
220.00	50136.40	1595.59
220.00	60143.60	1638.17
220.00	70150.80	1678.49
220.00	80157.90	1716.78

220.00	90165.10	1753.24
220.00	100172.00	1788.2
240.00	252.21	1219.33
240.00	602.15	1222.0
240.00	1103.02	1225.8
240.00	2103.48	1233.3
240.00	2104.31	1233.3
240.00	3104.05	1240.7
240.00	3105.10	1240.7
240.00	4104.68	1248.0
240.00	4105.89	1248.0
240.00	5105.31	1255.2
240.00	5106.62	1255.2
240.00	6107.33	1262.31
240.00	12612.00	1306.37
240.00	15113.00	1322.45
240.00	17614.70	1338.08
240.00	20116.40	1353.31
240.00	25119.90	1382.68
240.00	30123.40	1410.72
240.00	35126.80	1437.56
240.00	40130.30	1463.36
240.00	45134.10	1488.2
240.00	50137.60	1512.19
240.00	60144.60	1557.82
240.00	70151.60	1600.75
240.00	7108.05	1269.32
240.00	8108.78	1276.24
240.00	9109.52	1283.08
240.00	10110.20	1289.84
240.00	80158.50	1641.41
240.00	90165.30	1680.02
240.00	100172.00	1716.86
260.00	251.45	1109.14
260.00	601.45	1112.23
260.00	1102.15	1116.62
260.00	2102.77	1125.27
260.00	2103.13	1125.31
260.00	3103.43	1133.77
260.00	3103.82	1133.82
260.00	4104.07	1142.13
260.00	4104.51	1142.17
260.00	5104.72	1150.34
260.00	5105.21	1150.38

260.00	6105.88	1158.47
260.00	7106.52	1166.42
260.00	8107.23	1174.26
260.00	9107.95	1181.97
260.00	10108.30	1189.58
259.99	12610.00	1208.12
260.00	15111.70	1226.05
260.00	17613.40	1243.41
260.00	20115.10	1260.26
260.00	25118.60	1292.53
260.00	30122.10	1323.15
260.00	35125.50	1352.3
260.00	40129.00	1380.18
260.00	45132.70	1406.9
260.00	50136.40	1432.6
260.00	60143.60	1481.28
260.00	70150.70	1526.84
259.99	80157.60	1569.77
259.99	90164.60	1610.4
260.00	100172.00	1649.05
280.00	250.96	999.47
280.00	601.00	1003.08
280.00	1101.74	1008.21
280.00	2102.38	1018.28
280.00	12609.90	1112.63
280.00	15111.50	1132.65
280.00	17613.30	1151.93
280.00	20114.90	1170.54
280.00	2102.38	1018.3
280.00	3103.03	1028.13
280.00	3103.12	1028.15
280.00	4103.63	1037.77
280.00	4103.90	1037.79
280.00	5104.07	1047.2
280.00	5104.65	1047.23
280.00	6105.39	1056.49
280.00	7106.09	1065.56
280.00	8106.82	1074.46
280.00	9107.55	1083.21
280.00	10108.20	1091.8
280.00	25118.30	1205.97
280.00	30121.70	1239.32
280.00	35125.10	1270.88
280.00	40128.50	1300.89

280.00	45132.00	1329.54
280.00	50135.30	1356.98
280.00	60142.30	1408.68
280.00	70149.30	1456.81
280.00	80158.90	1501.97
280.00	90165.90	1544.56
280.00	100173.00	1584.94
300.00	599.94	893.833
300.01	1100.40	899.926
300.00	2102.01	911.889
300.00	2104.25	911.909
300.00	3102.80	923.459
300.00	3104.95	923.478
300.00	4103.65	934.713
300.00	4105.67	934.728
300.00	5104.44	945.669
300.00	5105.89	945.676
300.00	6106.51	956.354
300.00	7107.18	966.776
300.00	8107.81	976.954
300.00	12610.50	1020.17
300.00	15112.20	1042.56
300.00	17613.90	1063.97
300.00	20115.00	1084.5
300.00	25118.50	1123.32
300.00	30121.90	1159.56
300.00	35125.40	1193.62
300.00	40128.90	1225.82
300.00	45132.40	1256.41
300.00	50135.90	1285.58
300.00	60143.00	1340.29
300.00	70150.10	1390.94
299.99	80158.10	1438.22
300.00	9108.38	986.906
300.00	10108.80	996.678
299.99	90165.20	1482.66
299.99	100172.00	1524.68
320.00	601.27	783.221
320.00	1101.18	790.665
320.00	2101.87	805.078
320.00	2104.08	805.159
320.00	3102.51	818.927
320.00	3104.80	819.008
320.00	4103.20	832.273

320.00	4105.51	832.354
320.00	5103.84	845.165
320.00	5106.14	845.242
320.00	6106.80	857.711
320.00	7107.48	869.802
320.00	8108.17	881.54
320.00	9108.89	892.953
320.00	10109.10	904.045
320.00	10109.60	904.067
320.00	12611.30	930.654
320.00	15112.90	955.743
320.00	17614.70	979.543
320.00	20116.40	1002.21
320.00	25119.90	1044.68
320.00	30123.40	1083.95
320.00	35126.90	1120.58
320.00	40130.40	1155.01
320.00	45134.00	1187.55
320.00	50137.30	1218.44
320.00	50137.50	1218.44
320.00	60144.40	1276.1
320.00	70151.60	1329.16
320.00	80158.40	1378.48
320.00	90165.50	1424.69
320.00	100173.00	1468.23
340.00	1100.43	678.122
340.00	2101.09	696.215
340.00	2103.65	696.271
340.00	3101.74	713.3
340.00	3104.31	713.359
340.00	4102.42	729.532
340.00	4105.01	729.589
340.00	5102.92	745.009
340.00	5105.58	745.066
340.00	6106.20	759.882
340.00	7106.82	774.104
340.00	8107.47	787.795
340.00	9108.12	801.008
340.00	10106.50	813.726
340.00	10108.50	813.773
340.00	12610.40	844.028
340.00	15112.20	872.222
340.00	17614.00	898.696
340.00	20115.70	923.702

340.00	25119.20	970.085
340.00	30122.60	1012.52
340.00	35126.10	1051.8
340.00	40129.60	1088.46
340.00	45133.00	1122.94
340.00	50136.50	1155.53
340.00	60144.70	1216.04
340.00	70151.80	1271.43
340.00	80158.80	1322.7
340.00	90165.80	1370.55
340.00	100173.00	1415.54
360.00	2100.75	582.292
360.00	2103.86	582.372
360.00	3101.39	604.477
360.00	3101.42	604.479
360.00	3104.59	604.562
360.00	4102.00	625.0
360.00	4102.06	624.999
360.00	4105.35	625.09
360.00	5102.59	644.168
360.00	5102.98	644.182
360.00	5106.07	644.251
360.00	6106.86	662.279
360.00	7107.63	679.33
360.00	8108.38	695.538
360.00	9109.09	711.01
360.00	10109.80	725.827
360.00	12611.50	760.445
360.00	15113.30	792.205
360.00	17615.10	821.665
360.00	20116.80	849.226
360.00	25120.40	899.751
360.00	30124.20	945.466
360.00	35127.80	987.407
360.00	40131.20	1026.3
360.00	45134.60	1062.68
360.00	50138.10	1096.92
360.00	60145.10	1160.16
360.00	70152.10	1217.74
360.00	80159.00	1270.82
360.00	90166.10	1320.23
360.00	100173.00	1366.55
380.00	2103.23	456.129
380.00	3104.16	488.076

380.00	4105.03	515.932
380.00	5105.83	540.877
380.00	6106.71	563.618
380.00	7107.52	584.618
380.00	8108.31	604.199
380.00	9109.12	622.597
380.00	10109.90	639.978
380.00	12611.10	679.849
380.00	15112.80	715.711
380.00	17614.50	748.486
380.00	20116.20	778.799
380.00	25119.70	833.691
380.00	30123.30	882.725
380.00	35126.80	927.317
380.00	40131.60	968.4
380.00	45135.10	1006.62
380.00	50138.70	1042.44
380.00	60145.70	1108.27
380.00	70152.70	1167.91
380.00	80159.70	1222.69
380.00	90166.70	1273.52
380.00	100174.00	1321.06
400.00	2704.85	329.55
400.00	3105.08	351.68
400.00	4105.76	396.177
400.00	5106.37	431.84
400.00	6107.01	462.275
400.00	7107.72	489.164
400.00	8108.42	513.443
400.00	9109.39	535.712
400.00	10110.20	556.355
400.00	12612.00	602.563
400.00	15113.90	643.081
400.00	17615.70	679.473
400.00	20117.50	712.704
400.00	25121.10	772.062
400.00	30124.70	824.409
400.00	35128.30	871.587
400.00	40131.50	914.764
400.00	45135.00	954.727
400.00	50138.40	992.039
400.00	60145.30	1060.28
400.00	70152.30	1121.82
400.00	80159.20	1178.14

400.00	90166.10	1230.27
400.00	100173.00	1278.93
420.00	4104.41	244.514
420.00	4455.16	271.524
420.00	4604.99	281.85
420.00	4955.63	302.472
420.00	5105.08	310.479
420.00	5456.11	327.761
420.00	5605.74	334.633
420.00	6105.77	355.802
420.00	6606.48	374.829
420.00	7106.50	392.204
420.00	8107.22	423.269
420.00	9107.96	450.696
420.00	10109.00	475.453
420.00	12610.80	529.119
420.00	15112.50	574.769
420.00	17614.90	614.982
420.00	20116.70	651.2
420.00	25120.20	714.992
420.00	30123.70	770.535
420.00	35127.10	820.167
420.00	40130.60	865.305
420.00	45134.00	906.887
420.00	50137.50	945.566
420.00	50138.00	945.569
420.00	55141.50	981.829
420.00	60145.00	1016.01
420.00	70152.10	1079.28
420.00	80159.20	1137.01
420.00	90166.30	1190.31
420.00	100173.00	1239.96
430.00	5105.60	236.474
430.00	5355.26	258.169
430.00	5605.96	273.029
430.00	5855.60	287.251
430.00	6106.29	300.071
430.00	6356.29	311.899
430.00	6356.31	311.9
430.00	6606.63	323.008
430.00	7106.84	343.373
430.00	7106.87	343.374
430.00	7607.19	361.852
430.00	8107.49	378.831

430.00	8607.80	394.6
430.00	9108.14	409.364
430.00	9608.49	423.279
430.00	10108.80	436.468
430.00	11109.60	461.005
430.00	12110.40	483.546
430.00	13111.40	504.468
430.00	14111.80	524.058
430.00	15112.60	542.492
430.00	17614.00	584.593
430.00	20115.70	622.274
430.00	15112.60	542.492
430.00	17614.00	584.593
430.00	20115.70	622.274

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Bubble Point Measurements of
n-Butane + n-Octane and n-Butane +
n-Pentane Binary Mixtures for (x1 =
n-butane + x2 isobutane) with x1 =
0.25, 0.4, 0.6, and 0.8 Equilibrium
Data for the Hexadecane (H46) +
n-Pentane (H50) System from 270 to 370 K
273 to 373 K trans-But-2-ene, +
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Measurements for the Binary and Ternary
Systems of n-Pentane Liquid Mixtures
and Mixtures of n-Butane, n-Hexane, and
n-Octane with n-Octane and n-Pentane
Dilution Activity Coefficients of Binary
Measurements of the (Butane, T)
Phase Equilibria of Hydrocarbons at
20 to 140 K and 0.1 to 2 MPa Liquid
Phase Data for n-Butane and n-Pentane
Equilibrium Data for the Binary
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n-Pentane + n-Heptane and Hexane in
Temperature-Dependent Vapor Pressure
Temperature System, measurement and
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energy of binary mixtures of hydrogen
sulfide with ethane, propane, and
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Isothermal (vapour + liquid) equilibrium measurements and correlation for the H₂-butane system and Infinite Dilution Activity Coefficients of Propane [245fa] Presenting author's address from 1986-1990, 1990-1996), trans-2-Butene, and n-butane in mixtures with propane at 330 K; other propane binary interactions between propyl acetate-butene (mole) at various systems diethyl sulphide + 1-butene, 1-butene + 2-methylpropane, 1-butene + 2-methylpropane, Propylene-propene, n-butane, Vapors Liquid Equilibrium Measurements and modeling of the n-butane + ethanol system from 323 to 423K;

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Measurements of the Speed of Sound in Liquid n-Butane:
Isothermal binary vapour liquid equilibrium for butanes and butenes with other hydrocarbons: Three Dimethyl Ether Binary Systems: Dimethyl Ether (High ρ) + Propane (High ρ), butane (High ρ) + Propane (High ρ) and two critical mixtures of Methanol (system and LE) Solutions for the Binary Systems Propane (High ρ) + Butane (2) and Propane (High ρ) + Butane (2).
Measurements and correlation for the vapour liquid equilibria (P-T-facial tensions and compositional data for near critical mixtures of butane + Butane and Decane Binary Systems at 310.95K: Experimental Study of p- ρ -T Relationship of Compressed Liquid Phase and Compressibility and Two Multi-component n-Alkane mixtures up vapor liquid equilibrium for Butane + Methanol, + Ethanol, + 2-Propanol, + n-Butane, Determination of Phase Equilibria of Methyl Benzoate + Alkane McGowan Method: Infrared Absorption Method. Comparison with Polar Measurements of the (p- ρ -T) relation GC-SAFT Predictions.
Solubility and critical temperature for vapor liquid equilibria (P-T) for 12 near critical systems and critical activity coefficients of Activity Coefficients of Propane, Propene, Butane, 2-Methylpropane, 1-Butene, 2-Methylpropene, trans-2-Butene, cis-2-Butene, 1,3-Butadiene, Dimethyl Ether, Chloroethane, and 1,1-Difluoroethane in 2-Methylphenol, 3-Methylphenol, and 4-Methylphenol:

Legend

af:	Acentric Factor
aigt:	Autoignition Temperature
ap:	Aniline Point
chg:	Standard gas enthalpy of combustion
cpg:	Ideal gas heat capacity
cpl:	Liquid phase heat capacity
dm:	Dipole Moment
dvisc:	Dynamic viscosity
fl:	Lower Flammability Limit
flu:	Upper Flammability Limit
fpo:	Flash Point (Open Cup Method)
gf:	Standard Gibbs free energy of formation
gyrad:	Radius of Gyration

hcg:	Heat of Combustion, Gross form
hcn:	Heat of Combustion, Net Form
hf:	Enthalpy of formation at standard conditions
hfus:	Enthalpy of fusion at standard conditions
hfust:	Enthalpy of fusion at a given temperature
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
nfpaf:	NFPA Fire Rating
nfpah:	NFPA Health Rating
pc:	Critical Pressure
pt:	Triple Point Pressure
pvap:	Vapor pressure
rfi:	Refractive Index
rhof:	Liquid Density
sfust:	Entropy of fusion at a given temperature
sl:	Liquid phase molar entropy at standard conditions
speedsl:	Speed of sound in fluid
srf:	Surface Tension
svapt:	Entropy of vaporization at a given temperature
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tf:	Normal melting (fusion) point
tt:	Triple Point Temperature
vc:	Critical Volume
zc:	Critical Compressibility
zra:	Rackett Parameter

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