Dodecanoic acid, ethyl ester

Other names:	Ethyl dodecanoate
	Ethyl dodecylate
	Ethyl ester dodecanoic acid
	Ethyl ester of dodecanoic acid
	Ethyl laurate
	Ethyl laurinate
	Ethyl n-dodecanoate
	Ethyl n-dodecanote
	Lauric acid, ethyl ester
Inchi:	InChI=1S/C14H28O2/c1-3-5-6-7-8-9-10-11-12-13-14(15)16-4-2/h3-13H2,1-2H3
InchiKey:	MMXKVMNBHPAILY-UHFFFAOYSA-N
Formula:	C14H28O2
SMILES:	CCCCCCCCCCCC(=O)OCC
Mol. weight [g/mol]:	228.37
CAS:	106-33-2

Physical Properties

Property code	Value	Unit	Source
chl	-8778.00 ± 1.00	kJ/mol	NIST Webbook
gf	-166.92	kJ/mol	Joback Method
hf	-577.09	kJ/mol	Joback Method
hfus	39.83	kJ/mol	Solid liquid equilibrium in ternary mixtures of ethyl oleate, ethyl laurate and ethyl palmitate
hvap	80.00	kJ/mol	NIST Webbook
log10ws	-4.55		Crippen Method
logp	4.470		Crippen Method
mcvol	215.560	ml/mol	McGowan Method
pc	1579.71	kPa	Joback Method
rinpol	1558.00		NIST Webbook
rinpol	1579.00		NIST Webbook
rinpol	1578.00		NIST Webbook
rinpol	1579.00		NIST Webbook
rinpol	1578.00		NIST Webbook
rinpol	1582.00		NIST Webbook
rinpol	1581.00		NIST Webbook
rinpol	1593.00		NIST Webbook

rinpol	1597.00	NIST Webbook
rinpol	1596.00	NIST Webbook
rinpol	1566.00	NIST Webbook
rinpol	1597.00	NIST Webbook
rinpol	1596.00	NIST Webbook
rinpol	1581.00	NIST Webbook
rinpol	1595.00	NIST Webbook
rinpol	1577.00	NIST Webbook
rinpol	1577.00	NIST Webbook
rinpol	1581.00	NIST Webbook
rinpol	1590.00	NIST Webbook
rinpol	1591.00	NIST Webbook
rinpol	1590.00	NIST Webbook
rinpol	1591.00	NIST Webbook
rinpol	1591.00	NIST Webbook
rinpol	1577.00	NIST Webbook
rinpol	1581.00	NIST Webbook
rinpol	1579.00	NIST Webbook
rinpol	1593.00	NIST Webbook
rinpol	1592.00	NIST Webbook
rinpol	1595.00	NIST Webbook
rinpol	1596.00	NIST Webbook
rinpol	1597.00	NIST Webbook
rinpol	1588.00	NIST Webbook
rinpol	1563.00	NIST Webbook
rinpol	1593.00	NIST Webbook
rinpol	1593.00	NIST Webbook
rinpol	1576.00	NIST Webbook
rinpol	1577.00	NIST Webbook
rinpol	1596.00	NIST Webbook
rinpol	1594.00	NIST Webbook
rinpol	1598.00	NIST Webbook
rinpol	1595.00	NIST Webbook
rinpol	1590.00	NIST Webbook
rinpol	1578.00	NIST Webbook
rinpol	1591.00	NIST Webbook
rinpol	1578.00	NIST Webbook
rinpol	1579.00	NIST Webbook
rinpol	1578.00	NIST Webbook
rinpol	1581.00	NIST Webbook
rinpol	1578.00	NIST Webbook
rinpol	1579.00	NIST Webbook
rinpol	1597.00	NIST Webbook
rinpol	1578.00	NIST Webbook

rinpol	1579.00	NIST Webbook
rinpol	1570.00	NIST Webbook
rinpol	1577.00	NIST Webbook
rinpol	1592.00	NIST Webbook
rinpol	1603.00	NIST Webbook
rinpol	1603.00	NIST Webbook
rinpol	1595.00	NIST Webbook
rinpol	1595.00	NIST Webbook
rinpol	1595.00	NIST Webbook
rinpol	1590.00	NIST Webbook
rinpol	1591.00	NIST Webbook
rinpol	1582.00	NIST Webbook
rinpol	1576.00	NIST Webbook
rinpol	1577.00	NIST Webbook
rinpol	1594.00	NIST Webbook
rinpol	1597.00	NIST Webbook
rinpol	1596.00	NIST Webbook
rinpol	1598.00	NIST Webbook
rinpol	1579.00	NIST Webbook
rinpol	1597.00	NIST Webbook
rinpol	1597.00	NIST Webbook
rinpol	1597.00	NIST Webbook
rinpol	1597.00	NIST Webbook
rinpol	1597.00	NIST Webbook
rinpol	1583.00	NIST Webbook
rinpol	1595.00	NIST Webbook
rinpol	1597.00	NIST Webbook
rinpol	1579.00	NIST Webbook
rinpol	1579.00	NIST Webbook
rinpol	1576.00	NIST Webbook
rinpol	1577.00	NIST Webbook
rinpol	267.60	NIST Webbook
rinpol	1593.00	NIST Webbook
rinpol	1588.00	NIST Webbook
rinpol	1581.00	NIST Webbook
rinpol	1591.00	NIST Webbook
rinpol	1577.00	NIST Webbook
rinpol	1576.00	NIST Webbook
rinpol	1558.00	NIST Webbook
rinpol	1597.00	NIST Webbook
rinpol	1595.00	NIST Webbook
rinpol	1579.00	NIST Webbook
rinpol	1577.00	NIST Webbook
rinpol	1578.00	NIST Webbook

rinpol	1578.00	NIST Webbook
rinpol	1576.00	NIST Webbook
rinpol	1596.00	NIST Webbook
rinpol	1591.00	NIST Webbook
ripol	1824.00	NIST Webbook
ripol	1873.00	NIST Webbook
ripol	1842.00	NIST Webbook
ripol	1842.00	NIST Webbook
ripol	1860.00	NIST Webbook
ripol	1840.00	NIST Webbook
ripol	1874.00	NIST Webbook
ripol	1846.00	NIST Webbook
ripol	1873.00	NIST Webbook
ripol	1844.00	NIST Webbook
ripol	1844.00	NIST Webbook
ripol	1850.00	NIST Webbook
ripol	1847.00	NIST Webbook
ripol	1833.00	NIST Webbook
ripol	1856.00	NIST Webbook
ripol	1825.00	NIST Webbook
ripol	1811.00	NIST Webbook
ripol	1848.00	NIST Webbook
ripol	1840.00	NIST Webbook
ripol	1825.00	NIST Webbook
ripol	1825.00	NIST Webbook
ripol	1824.00	NIST Webbook
ripol	1844.00	NIST Webbook
ripol	1848.00	NIST Webbook
ripol	1849.00	NIST Webbook
ripol	1848.00	NIST Webbook
ripol	1849.00	NIST Webbook
ripol	1850.00	NIST Webbook
ripol	1840.00	NIST Webbook
ripol	1851.00	NIST Webbook
ripol	1835.00	NIST Webbook
ripol	1851.00	NIST Webbook
ripol	1849.00	NIST Webbook
ripol	1850.00	NIST Webbook
ripol	1839.00	NIST Webbook
ripol	1850.00	NIST Webbook
ripol	1828.00	NIST Webbook
ripol	1836.00	NIST Webbook
ripol	1865.00	NIST Webbook
ripol	1866.00	NIST Webbook

ripol	1826.00		NIST Webbook
ripol	1830.00		NIST Webbook
ripol	1820.00		NIST Webbook
ripol	1829.00		NIST Webbook
ripol	1860.00		NIST Webbook
ripol	1850.00		NIST Webbook
ripol	1822.00		NIST Webbook
ripol	1820.00		NIST Webbook
ripol	1822.00		NIST Webbook
ripol	1820.00		NIST Webbook
ripol	1822.00		NIST Webbook
ripol	1826.00		NIST Webbook
ripol	1848.00		NIST Webbook
ripol	1850.00		NIST Webbook
ripol	1849.00		NIST Webbook
ripol	1850.00		NIST Webbook
ripol	1835.00		NIST Webbook
ripol	1856.00		NIST Webbook
ripol	1850.00		NIST Webbook
ripol	1850.00		NIST Webbook
ripol	1835.00		NIST Webbook
ripol	1849.00		NIST Webbook
ripol	1818.00		NIST Webbook
ripol	1827.00		NIST Webbook
ripol	1849.00		NIST Webbook
ripol	1839.00		NIST Webbook
ripol	1837.00		NIST Webbook
ripol	1836.00		NIST Webbook
ripol	1818.00		NIST Webbook
ripol	1837.00		NIST Webbook
ripol	1835.00		NIST Webbook
ripol	1833.00		NIST Webbook
ripol	1853.00		NIST Webbook
ripol	1823.00		NIST Webbook
ripol	1851.00		NIST Webbook
ripol	1824.00		NIST Webbook
ripol	1826.00		NIST Webbook
ripol	1850.00		NIST Webbook
ripol	1826.00		NIST Webbook
ripol	1848.00		NIST Webbook
ripol	1843.00		NIST Webbook
tb	448.00 ± 2.00	K	NIST Webbook
tb	463.00 ± 1.50	K	NIST Webbook
tc	764.02	K	Joback Method

tf	272.20	K	High pressure solid-liquid equilibrium of fatty acid ethyl esters binary systems
tf	273.20	K	Solid-liquid equilibrium in ternary mixtures of ethyl laurate, ethyl palmitate and ethyl stearate
tf	262.50 ± 0.20	K	NIST Webbook
tt	273.00	K	Influence of Additives (Isoamyl Laurate or Isoamyl Nonanoate) in the Solid-Liquid Equilibrium of Fatty Acid Ethyl Esters
vc	0.844	m3/kmol	Joback Method

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	567.02	J/mol×K	596.01	Joback Method
cpg	600.10	J/mol×K	652.01	Joback Method
cpg	615.63	J/mol×K	680.02	Joback Method
cpg	630.49	J/mol×K	708.02	Joback Method
cpg	644.71	J/mol×K	736.02	Joback Method
cpg	658.29	J/mol×K	764.02	Joback Method
cpg	583.90	J/mol×K	624.01	Joback Method
dvisc	0.0013486	Pa×s	343.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters
dvisc	0.0015703	Pa×s	333.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters
dvisc	0.0017037	Pa×s	328.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters
dvisc	0.0018531	Pa×s	323.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters
dvisc	0.0020240	Pa×s	318.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters
dvisc	0.0012543	Pa×s	348.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters

dvisc	0.0024455	Pa×s	308.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters
dvisc	0.0027073	Pa×s	303.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters
dvisc	0.0030152	Pa×s	298.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters
dvisc	0.0038135	Pa×s	288.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters
dvisc	0.0043353	Pa×s	283.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters
dvisc	0.0011708	Pa×s	353.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters
dvisc	0.0014529	Pa×s	338.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters
dvisc	0.0033797	Pa×s	293.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters
dvisc	0.0022198	Pa×s	313.15	Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters
hfust	9.31	kJ/mol	271.50	NIST Webbook
hfust	9.31	kJ/mol	271.50	NIST Webbook
hfust	9.31	kJ/mol	271.45	NIST Webbook
hvapt	67.20	kJ/mol	410.50	NIST Webbook
pvap	9.33	kPa	464.35	Determination of the vapor pressure of ethyl esters by Differential Scanning Calorimetry
pvap	0.03	kPa	351.88	Experimental Vapor Pressures of Five Saturated Fatty Acid Ethyl Ester (FAEE) Components of Biodiesel

pvap	0.12	kPa	372.12	Experimental Vapor Pressures of Five Saturated Fatty Acid Ethyl Ester (FAEE) Components of Biodiesel
pvap	0.23	kPa	382.17	Experimental Vapor Pressures of Five Saturated Fatty Acid Ethyl Ester (FAEE) Components of Biodiesel
pvap	8.00	kPa	462.44	Determination of the vapor pressure of ethyl esters by Differential Scanning Calorimetry
pvap	1.70	kPa	422.15	Experimental Vapor Pressures of Five Saturated Fatty Acid Ethyl Ester (FAEE) Components of Biodiesel
pvap	2.65	kPa	432.26	Experimental Vapor Pressures of Five Saturated Fatty Acid Ethyl Ester (FAEE) Components of Biodiesel
pvap	3.99	kPa	442.27	Experimental Vapor Pressures of Five Saturated Fatty Acid Ethyl Ester (FAEE) Components of Biodiesel
pvap	5.80	kPa	452.31	Experimental Vapor Pressures of Five Saturated Fatty Acid Ethyl Ester (FAEE) Components of Biodiesel
pvap	8.49	kPa	462.43	Experimental Vapor Pressures of Five Saturated Fatty Acid Ethyl Ester (FAEE) Components of Biodiesel
pvap	6.67	kPa	456.47	Determination of the vapor pressure of ethyl esters by Differential Scanning Calorimetry

pvap	0.40	kPa	392.24	Experimental Vapor Pressures of Five Saturated Fatty Acid Ethyl Ester (FAEE) Components of Biodiesel	
pvap	5.33	kPa	451.05	Determination of the vapor pressure of ethyl esters by Differential Scanning Calorimetry	
pvap	4.00	kPa	443.41	Determination of the vapor pressure of ethyl esters by Differential Scanning Calorimetry	
pvap	2.67	kPa	432.13	Determination of the vapor pressure of ethyl esters by Differential Scanning Calorimetry	
pvap	1.33	kPa	420.05	Determination of the vapor pressure of ethyl esters by Differential Scanning Calorimetry	
pvap	0.67	kPa	402.20	Experimental Vapor Pressures of Five Saturated Fatty Acid Ethyl Ester (FAEE) Components of Biodiesel	
pvap	0.07	kPa	362.10	Experimental Vapor Pressures of Five Saturated Fatty Acid Ethyl Ester (FAEE) Components of Biodiesel	
pvap	1.83e-03	kPa	313.10	Experimental Vapor Pressures of Five Saturated Fatty Acid Ethyl Ester (FAEE) Components of Biodiesel	
rfi	1.42547		308.15	Thermophysical properties of fatty acid methyl and ethyl esters	

rfi	1.42125	318.15	Thermophysical properties of fatty acid methyl and ethyl esters
rfi	1.42335	313.15	Thermophysical properties of fatty acid methyl and ethyl esters
rfi	1.41707	328.15	Thermophysical properties of fatty acid methyl and ethyl esters
rfi	1.41501	333.15	Thermophysical properties of fatty acid methyl and ethyl esters
rfi	1.41295	338.15	Thermophysical properties of fatty acid methyl and ethyl esters
rfi	1.41090	343.15	Thermophysical properties of fatty acid methyl and ethyl esters
rfi	1.40886	348.15	Thermophysical properties of fatty acid methyl and ethyl esters
rfi	1.40684	353.15	Thermophysical properties of fatty acid methyl and ethyl esters
rfi	1.42961	298.15	Thermophysical properties of fatty acid methyl and ethyl esters
rfi	1.43169	293.15	Thermophysical properties of fatty acid methyl and ethyl esters
rfi	1.43375	288.15	Thermophysical properties of fatty acid methyl and ethyl esters
rfi	1.43583	283.15	Thermophysical properties of fatty acid methyl and ethyl esters
rfi	1.43791	278.15	Thermophysical properties of fatty acid methyl and ethyl esters
rfi	1.40479	358.15	Thermophysical properties of fatty acid methyl and ethyl esters
rfi	1.41915	323.15	Thermophysical properties of fatty acid methyl and ethyl esters

rfi	1.42755		303.15	Thermophysical properties of fatty acid methyl and ethyl esters
rhol	858.19	kg/m3	298.15	Measurement and correlation of density and viscosity of n-hexadecane with three fatty acid ethyl esters
rhol	854.30	kg/m3	303.15	Measurement and correlation of density and viscosity of n-hexadecane with three fatty acid ethyl esters
rhol	850.40	kg/m3	308.15	Measurement and correlation of density and viscosity of n-hexadecane with three fatty acid ethyl esters
rhol	846.50	kg/m3	313.15	Measurement and correlation of density and viscosity of n-hexadecane with three fatty acid ethyl esters
rhol	842.60	kg/m3	318.15	Measurement and correlation of density and viscosity of n-hexadecane with three fatty acid ethyl esters
rhol	838.70	kg/m3	323.15	Measurement and correlation of density and viscosity of n-hexadecane with three fatty acid ethyl esters
rhol	862.16	kg/m3	293.15	Density, Viscosity, and Refractive Index of Binary Mixtures of Fatty Acid Ethyl Esters with Ethylcyclohexane
rhol	858.25	kg/m3	298.15	Density, Viscosity, and Refractive Index of Binary Mixtures of Fatty Acid Ethyl Esters with Ethylcyclohexane

rhol	854.36	kg/m3	303.15	Density, Viscosity, and Refractive Index of Binary Mixtures of Fatty Acid Ethyl Esters with Ethylcyclohexane
rhol	850.46	kg/m3	308.15	Density, Viscosity, and Refractive Index of Binary Mixtures of Fatty Acid Ethyl Esters with Ethylcyclohexane
rhol	846.56	kg/m3	313.15	Density, Viscosity, and Refractive Index of Binary Mixtures of Fatty Acid Ethyl Esters with Ethylcyclohexane
rhol	842.66	kg/m3	318.15	Density, Viscosity, and Refractive Index of Binary Mixtures of Fatty Acid Ethyl Esters with Ethylcyclohexane
rhol	838.75	kg/m3	323.15	Density, Viscosity, and Refractive Index of Binary Mixtures of Fatty Acid Ethyl Esters with Ethylcyclohexane
tcondl	0.15	W/m×K	274.73	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel
tcondl	0.15	W/m×K	284.69	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel

tcondl	0.15	W/m×K	294.56	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel	
tcondl	0.14	W/m×K	304.59	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel	
tcondl	0.14	W/m×K	314.47	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel	
tcondl	0.14	W/m×K	324.41	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel	
tcondl	0.14	W/m×K	334.28	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel	
tcondl	0.14	W/m×K	344.09	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel	
tcondl	0.13	W/m×K	349.21	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel	

tcondl	0.13	W/m×K	354.09	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel
tcondl	0.13	W/m×K	359.09	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel
tcondl	0.13	W/m×K	369.13	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel
tcondl	0.13	W/m×K	379.10	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel
tcondl	0.13	W/m×K	389.10	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel
tcondl	0.12	W/m×K	400.08	Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel

Correlations

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/(T + C)
Coeff. A	1.52891e+01

Coeff. B	-4.79892e+03
Coeff. C	-9.24240e+01
Temperature range (K), min.	412.32
Temperature range (K), max.	573.39

Datasets

Molar heat capacity at constant pressure, J/K/mol

Temperature, K - Liquid	Pressure, kPa - Liquid	Molar heat capacity at constant pressure, J/K/mol - Liquid
313.27	140.00	474.00
313.26	5030.00	472.00
313.26	9990.00	471.00
313.27	14970.00	470.00
313.29	20040.00	470.00
313.28	25150.00	469.00
323.22	160.00	480.00
323.23	4980.00	478.00
323.23	10110.00	477.00
323.23	14920.00	476.00
323.22	20140.00	475.00
323.22	25150.00	474.00
333.20	140.00	487.00
333.20	4920.00	485.00
333.20	10150.00	483.00
333.20	15060.00	482.00
333.20	19970.00	481.00
333.21	25020.00	480.00
343.15	140.00	493.00
343.16	5160.00	491.00
343.16	10270.00	489.00
343.19	15130.00	488.00
343.19	20220.00	487.00
343.21	25180.00	486.00
353.14	180.00	501.00
353.14	4970.00	498.00
353.17	9950.00	496.00
353.17	14920.00	494.00

353.17	20020.00	492.00
353.18	24950.00	491.00
363.17	110.00	508.00
363.18	5010.00	507.00
363.29	10190.00	505.00
363.29	15070.00	503.00
363.29	20150.00	501.00
363.29	25100.00	500.00
373.19	110.00	516.00
373.20	4900.00	514.00
373.21	10170.00	512.00
373.21	15020.00	511.00
373.22	19850.00	509.00
373.25	24930.00	508.00
383.23	100.00	523.00
383.23	5000.00	521.00
383.23	10040.00	520.00
383.24	15080.00	518.00
383.25	19940.00	517.00
383.28	25150.00	515.00
393.22	110.00	532.00
393.20	4910.00	530.00
393.22	10100.00	530.00
393.27	15020.00	529.00
393.23	19780.00	528.00
393.27	24830.00	527.00

Reference *https://www.doi.org/10.1016/j.fluid.2018.09.017*

Mass density, kg/m3

Pressure, kPa - Liquid	Temperature, K - Liquid	Mass density, kg/m3 - Liquid
100.00	283.15	869.69
1000.00	283.15	870.36
3000.00	283.15	871.92
5000.00	283.15	872.91
10000.00	283.15	876.08
15000.00	283.15	878.96
20000.00	283.15	881.89
25000.00	283.15	884.58
30000.00	283.15	887.29

35000.00	283.15	890.05
40000.00	283.15	892.47
50000.00	283.15	897.22
60000.00	283.15	901.93
100.00	293.15	862.5
1000.00	293.15	863.0
3000.00	293.15	864.24
5000.00	293.15	865.2
10000.00	293.15	868.58
15000.00	293.15	871.64
20000.00	293.15	874.58
25000.00	293.15	877.55
30000.00	293.15	880.26
35000.00	293.15	882.89
40000.00	293.15	885.52
50000.00	293.15	890.85
60000.00	293.15	895.29
100.00	303.15	854.28
1000.00	303.15	855.02
3000.00	303.15	856.39
5000.00	303.15	857.69
10000.00	303.15	860.98
15000.00	303.15	864.33
20000.00	303.15	867.23
25000.00	303.15	870.25
30000.00	303.15	873.21
35000.00	303.15	876.08
40000.00	303.15	878.71
50000.00	303.15	883.88
60000.00	303.15	888.85
100.00	313.15	846.91
1000.00	313.15	847.32
3000.00	313.15	848.68
5000.00	313.15	850.07
10000.00	313.15	853.51
15000.00	313.15	856.86
20000.00	313.15	860.1
25000.00	313.15	863.29
30000.00	313.15	866.24
35000.00	313.15	869.1
40000.00	313.15	871.83
50000.00	313.15	877.43
60000.00	313.15	882.35
100.00	323.15	838.9

1000.00	323.15	839.64
3000.00	323.15	841.1
5000.00	323.15	842.59
10000.00	323.15	846.29
15000.00	323.15	849.77
20000.00	323.15	853.3
25000.00	323.15	856.35
30000.00	323.15	859.5
35000.00	323.15	862.45
40000.00	323.15	865.48
50000.00	323.15	871.16
60000.00	323.15	876.11
100.00	333.15	831.05
1000.00	333.15	831.72
3000.00	333.15	833.53
5000.00	333.15	835.15
10000.00	333.15	838.84
15000.00	333.15	842.47
20000.00	333.15	846.07
25000.00	333.15	849.47
30000.00	333.15	852.73
35000.00	333.15	855.75
40000.00	333.15	859.06
50000.00	333.15	864.9
60000.00	333.15	870.44
100.00	343.15	823.11
1000.00	343.15	824.13
3000.00	343.15	825.84
5000.00	343.15	827.55
10000.00	343.15	831.53
15000.00	343.15	835.33
20000.00	343.15	839.18
25000.00	343.15	842.57
30000.00	343.15	846.08
35000.00	343.15	849.44
40000.00	343.15	852.46
50000.00	343.15	858.61
60000.00	343.15	864.08
100.00	353.15	815.47
1000.00	353.15	816.33
3000.00	353.15	818.26
5000.00	353.15	819.99
10000.00	353.15	824.24
15000.00	353.15	828.35

20000.00	353.15	832.01
25000.00	353.15	835.81
30000.00	353.15	839.36
35000.00	353.15	842.72
40000.00	353.15	846.01
50000.00	353.15	852.29
60000.00	353.15	858.27
100.00	363.15	807.52
1000.00	363.15	808.53
3000.00	363.15	810.45
5000.00	363.15	812.32
10000.00	363.15	816.46
15000.00	363.15	821.01
20000.00	363.15	824.82
25000.00	363.15	828.56
30000.00	363.15	832.36
35000.00	363.15	835.98
40000.00	363.15	839.55
50000.00	363.15	845.99
60000.00	363.15	852.14

Reference *https://www.doi.org/10.1016/j.jct.2016.08.027*

Temperature, K	Pressure, kPa	Mass density, kg/m3
303.06	100.00	853.9
303.07	3050.00	856.6
303.26	5990.00	858.4
303.22	9020.00	860.5
303.23	11990.00	862.5
303.24	15030.00	864.5
313.08	100.00	846.3
313.08	3010.00	848.3
313.10	5980.00	850.4
313.15	9030.00	852.6
313.17	12010.00	854.4
313.26	15030.00	857.5
323.14	100.00	838.3
323.09	3050.00	840.8
323.17	5980.00	842.9
323.17	8980.00	845.0
323.17	11990.00	847.0
323.18	15020.00	849.0
333.17	100.00	830.8

333.17	3010.00	833.0
333.07	6000.00	835.8
333.20	9040.00	838.1
333.17	12040.00	840.3
333.15	15040.00	842.5
342.95	100.00	823.2
343.00	3000.00	825.3
343.19	5980.00	828.3
343.28	9020.00	830.8
343.19	11980.00	832.8
343.19	15020.00	834.9
353.15	100.00	815.3
353.15	3050.00	818.4
353.20	6030.00	820.9
353.19	9020.00	823.2
353.18	12010.00	825.6
353.19	15020.00	827.9

Reference *https://www.doi.org/10.1016/j.tca.2018.03.007*

Speed of sound, m/s

Temperature, K - Liquid	Pressure, kPa - Liquid	Speed of sound, m/s - Liquid
293.15	100.00	1339.9
293.15	10000.00	1390.8
293.15	20000.00	1436.7
293.15	30000.00	1479.3
293.15	40000.00	1519.0
293.15	50000.00	1555.9
293.15	60000.00	1591.9
293.15	70000.00	1626.2
293.15	80000.00	1659.7
293.15	90000.00	1690.9
293.15	100000.00	1720.9
293.15	120000.00	1778.5
313.15	100.00	1266.1
313.15	10000.00	1317.6
313.15	20000.00	1365.0
313.15	30000.00	1409.3
313.15	40000.00	1452.1
313.15	50000.00	1491.4

313.15	60000.00	1529.2
313.15	70000.00	1564.8
313.15	80000.00	1600.2
313.15	90000.00	1632.3
313.15	100000.00	1663.0
313.15	120000.00	1721.9
313.15	140000.00	1777.9
313.15	160000.00	1830.9
333.15	100.00	1194.0
333.15	10000.00	1250.3
333.15	20000.00	1300.9
333.15	30000.00	1348.0
333.15	40000.00	1393.4
333.15	50000.00	1434.3
333.15	60000.00	1473.3
333.15	70000.00	1509.8
333.15	80000.00	1545.4
333.15	90000.00	1578.6
333.15	100000.00	1610.9
333.15	120000.00	1674.1
333.15	140000.00	1730.4
333.15	160000.00	1782.7
333.15	180000.00	1835.3
333.15	200000.00	1883.8
353.15	100.00	1125.7
353.15	10000.00	1186.0
353.15	20000.00	1240.6
353.15	30000.00	1290.3
353.15	40000.00	1337.1
353.15	50000.00	1379.7
353.15	60000.00	1419.8
353.15	70000.00	1458.8
353.15	80000.00	1496.2
353.15	90000.00	1530.6
353.15	100000.00	1564.4
353.15	120000.00	1627.0
353.15	140000.00	1685.1
353.15	160000.00	1740.7
353.15	180000.00	1793.6
353.15	200000.00	1843.5

Reference *https://www.doi.org/10.1016/j.jct.2017.12.020*

Sources

Solid-liquid equilibrium in ternary mixtures of ethyl laurate, ethyl palmitate and ethyl myristate:	https://www.doi.org/10.1016/j.fluid.2013.10.024
McGowan Method:	http://link.springer.com/article/10.1007/BF02311772
Solid-liquid equilibrium in ternary mixtures of ethyl laurate, ethyl palmitate and ethyl stearate:	https://www.doi.org/10.1016/j.fluid.2013.08.024
Experimental and correlational study of isobaric molar heat capacities of fatty acid esters: Ethyl nonanoate and ethyl dodecanoate:	https://www.doi.org/10.1016/j.fluid.2018.09.017
Density, Viscosity, and Refractive Index of Binary Mixtures of Fatty Acid Ethyl Esters with Ethylcyclohexane:	https://www.doi.org/10.1021/acs.jced.9b00544
Measurement on the thermal conductivity of five saturated fatty acid ethyl esters components of biodiesel:	https://www.doi.org/10.1016/j.fluid.2018.06.004
Thermophysical properties of fatty acid methyl and ethyl esters:	https://www.doi.org/10.1016/j.jct.2019.02.025
Joback Method:	https://en.wikipedia.org/wiki/Joback_method
The Yaws Handbook of Vapor Pressure:	https://www.sciencedirect.com/book/9780128029992/the-yaws-handbook-of-vapor-pressure
Experimental Vapor Pressures of Five Saturated Fatty Acid Ethyl Ester (FAEE) Components of Biodiesel:	https://www.doi.org/10.1021/je200730m
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C106332&Units=SI
Crippen Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l
Measurement and correlation of viscosities and densities of methyl dodecanoate and ethyl dodecanoate at Pressures:	https://www.doi.org/10.1016/j.tca.2018.03.007
Solid-liquid equilibrium in ternary mixtures of ethyl oleate, ethyl laurate and ethyl palmitate:	https://www.doi.org/10.1016/j.fluid.2012.11.030
Influence of Additives (Isoamyl Laurate or Isoamyl Nonanoate) in the Solid-Liquid Equilibrium of Fatty Acid Ethyl Esters:	https://www.doi.org/10.1021/acs.jced.8b01019
High-pressure liquid densities and derived thermodynamic properties for Measurement and correlation of vapor liquid equilibria for ethanol + ethyl laurate and ethanol + ethyl myristate systems near critical temperature of ethanol:	https://www.doi.org/10.1016/j.jct.2016.08.027
Methyl laurate and ethyl laurate:	https://www.doi.org/10.1016/j.fluid.2007.11.014
Determination of the vapor pressure of ethyl esters by Differential Scanning Calorimetry:	https://www.doi.org/10.1016/j.jct.2011.01.017
Measurement and correlation of density and viscosity of n-hexadecane with three fatty acid ethyl esters:	https://www.doi.org/10.1016/j.jct.2016.01.021
High pressure solid-liquid equilibrium of fatty acid ethyl esters binary systems:	https://www.doi.org/10.1016/j.fluid.2014.09.007
Measurement of speed of sound, density compressibility and viscosity in liquid methyl laurate and ethyl laurate at 0.1 MPa by using acoustic wave sensing:	https://www.doi.org/10.1016/j.jct.2017.12.020
High Pressure Phase Equilibria of the CO2/Saturated Ethyl Esters Densities and Viscosities of Fatty Acid Methyl and Ethyl Esters:	https://www.doi.org/10.1021/acs.jced.7b00780
Phase equilibrium measurements and thermodynamic modeling of binary mixtures containing a diesel compound n-dodecane + biodiesel compounds: Ethyl dodecanoate and ethyl octanoate:	https://www.doi.org/10.1021/je100042c
Crippen Method:	https://www.doi.org/10.1016/j.jct.2017.06.003
	https://www.chemeo.com/doc/models/crippen_log10ws

Legend

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
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
ripol:	Polar retention indices
speedsl:	Speed of sound in fluid
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tcondl:	Liquid thermal conductivity
tf:	Normal melting (fusion) point
tt:	Triple Point Temperature
vc:	Critical Volume