# Oleic Acid

**Other names:**

(Z)-9-Octadecanoic acid
(Z)-9-octadecenoic acid
(Z)-Octadec-9-enoic acid
.DELTA.9-cis-octadecenoic acid
.DELTA.9-cis-oleic acid
9-(Z)-octadecenoic acid
9-Octadecenoic acid (9Z)-
9-Octadecenoic acid (Z)-
9-Octadecenoic acid, cis-
9-cis-octadecenoic acid
9-octadecenoic acid, (Z)-
Century cd fatty acid
D 100
Elaic acid
Elaidoic acid
Emersol 205
Emersol 210
Emersol 211
Emersol 213
Emersol 220 White Oleic Acid
Emersol 221 Low Titer White Oleic Acid
Emersol 6313 NF
Emersol 6321
Extraolein 90
Glycon RO
Glycon WO
Groco 2
Groco 4
Groco 5l
Groco 6
Hy-phi 1055
Hy-phi 1088
Hy-phi 2066
Hy-phi 2088
Hy-phi 2102
Industrene 105
Industrene 205
Industrene 206
K 52
L'Acide oleique

Metaupon
Oelsauere
Oleine 7503
Oleinic acid
Pamolyn
Pamolyn 100
Priolene 6906
Tego-oleic 130
Vopcolene 27
Wecoline OO
Wochem no. 320
Z-9-Octadecenoic acid
cis-.DELTA.9-octadecenoic acid
cis-9-Octadecenoic Acid
cis-Octadec-9-enoic acid
cis-Oleic Acid
cis-«DELTA»9-Octadecenoate
cis-«DELTA»9-octadecenoic acid
cis-Â«DELTAÂ»9-Octadecenoate
cis-Â«DELTAÂ»9-octadecenoic acid
lunac O-CA
neo-Fat 90-04
neo-Fat 92-04
priolene 6907
«DELTA»9-cis-Oleic acid
Â«DELTAÂ»9-cis-Oleic acid

**Inchi:** InChI=1S/C18H34O2/c1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18(19)20/h9-10H,2-8,

**InchiKey:** ZQPPMHVWECSIRJ-KTKRTIGZSA-N

**Formula:** C18H34O2

**SMILES:** CCCCCCCCC=CCCCCCCCC(=O)O

**Mol. weight [g/mol]:** 282.46

**CAS:** 112-80-1

# Physical Properties

| Property code | Value | Unit | Source |
|---|---|---|---|
| chl | -11160.70 | kJ/mol | NIST Webbook |
| gf | -84.84 | kJ/mol | Joback Method |
| hf | -562.44 | kJ/mol | Joback Method |
| hfl | -764.80 | kJ/mol | NIST Webbook |

| | | | |
|---|---|---|---|
| hfus | 48.26 | kJ/mol | Joback Method |
| hvap | 79.05 | kJ/mol | Joback Method |
| log10ws | -6.31 | | Crippen Method |
| logp | 6.109 | | Crippen Method |
| mcvol | 267.620 | ml/mol | McGowan Method |
| pc | 1332.96 | kPa | Joback Method |
| rinpol | 2102.00 | | NIST Webbook |
| rinpol | 2141.00 | | NIST Webbook |
| rinpol | 2147.00 | | NIST Webbook |
| rinpol | 2152.00 | | NIST Webbook |
| rinpol | 2113.00 | | NIST Webbook |
| rinpol | 2146.10 | | NIST Webbook |
| rinpol | 2130.00 | | NIST Webbook |
| rinpol | 2175.00 | | NIST Webbook |
| rinpol | 2175.00 | | NIST Webbook |
| rinpol | 2131.00 | | NIST Webbook |
| rinpol | 2141.00 | | NIST Webbook |
| rinpol | 2147.00 | | NIST Webbook |
| rinpol | 2147.00 | | NIST Webbook |
| rinpol | 2116.00 | | NIST Webbook |
| rinpol | 2146.00 | | NIST Webbook |
| rinpol | 2090.00 | | NIST Webbook |
| rinpol | 2180.00 | | NIST Webbook |
| rinpol | 2180.00 | | NIST Webbook |
| rinpol | 2115.00 | | NIST Webbook |
| rinpol | 2115.00 | | NIST Webbook |
| rinpol | 2110.00 | | NIST Webbook |
| rinpol | 2161.00 | | NIST Webbook |
| rinpol | 2112.00 | | NIST Webbook |
| rinpol | 2115.00 | | NIST Webbook |
| rinpol | 2131.00 | | NIST Webbook |
| rinpol | 2152.00 | | NIST Webbook |
| rinpol | 2175.00 | | NIST Webbook |
| rinpol | 2152.00 | | NIST Webbook |
| rinpol | 2173.00 | | NIST Webbook |
| rinpol | 2161.00 | | NIST Webbook |
| rinpol | 2098.00 | | NIST Webbook |
| rinpol | 2112.00 | | NIST Webbook |
| rinpol | 2146.00 | | NIST Webbook |
| rinpol | 2141.00 | | NIST Webbook |
| rinpol | 2155.00 | | NIST Webbook |
| rinpol | 2140.00 | | NIST Webbook |
| rinpol | 2131.00 | | NIST Webbook |
| rinpol | 2161.00 | | NIST Webbook |

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|---|---|---|---|
| rinpol | 2141.00 | | NIST Webbook |
| rinpol | 2175.00 | | NIST Webbook |
| rinpol | 2097.00 | | NIST Webbook |
| rinpol | 2115.00 | | NIST Webbook |
| rinpol | 2171.00 | | NIST Webbook |
| rinpol | 2140.00 | | NIST Webbook |
| rinpol | 2155.00 | | NIST Webbook |
| rinpol | 2120.00 | | NIST Webbook |
| rinpol | 2137.00 | | NIST Webbook |
| ripol | 3200.00 | | NIST Webbook |
| ripol | 3157.00 | | NIST Webbook |
| ripol | 3172.00 | | NIST Webbook |
| ripol | 3173.00 | | NIST Webbook |
| ripol | 3172.00 | | NIST Webbook |
| ripol | 3142.00 | | NIST Webbook |
| ripol | 3150.00 | | NIST Webbook |
| ripol | 3157.00 | | NIST Webbook |
| ripol | 3184.00 | | NIST Webbook |
| ripol | 3184.00 | | NIST Webbook |
| ripol | 3157.00 | | NIST Webbook |
| tb | 761.45 | K | Joback Method |
| tc | 937.21 | K | Joback Method |
| tf | 289.45 ± 0.50 | K | NIST Webbook |
| tf | 289.45 ± 0.30 | K | NIST Webbook |
| tf | 286.70 | K | Solid-Liquid Equilibria in Fatty Acid/Triglycerol Systems |
| vc | 1.048 | m3/kmol | Joback Method |

# Temperature Dependent Properties

| Property code | Value | Unit | Temperature [K] | Source |
|---|---|---|---|---|
| cpg | 899.26 | J/mol×K | 937.21 | Joback Method |
| cpg | 827.83 | J/mol×K | 790.74 | Joback Method |
| cpg | 843.52 | J/mol×K | 820.04 | Joback Method |
| cpg | 858.48 | J/mol×K | 849.33 | Joback Method |
| cpg | 872.72 | J/mol×K | 878.62 | Joback Method |
| cpg | 886.31 | J/mol×K | 907.92 | Joback Method |
| cpg | 811.35 | J/mol×K | 761.45 | Joback Method |
| dvisc | 0.0023727 | Pa×s | 398.29 | Joback Method |
| dvisc | 0.0006419 | Pa×s | 458.82 | Joback Method |
| dvisc | 0.0002355 | Pa×s | 519.34 | Joback Method |

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|---|---|---|---|---|
| dvisc | 0.0001065 | Pa×s | 579.87 | Joback Method |
| dvisc | 0.0000560 | Pa×s | 640.40 | Joback Method |
| dvisc | 0.0000210 | Pa×s | 761.45 | Joback Method |
| dvisc | 0.0000329 | Pa×s | 700.92 | Joback Method |
| hfust | 39.60 | kJ/mol | 286.50 | NIST Webbook |
| hfust | 39.60 | kJ/mol | 286.50 | NIST Webbook |
| hvapt | 132.60 | kJ/mol | 298.15 | Vaporization, Sublimation and Fusion Enthalpies of Some Saturated and Unsaturated Long Chain Fatty Acids by Correlation Gas Chromatography |
| hvapt | 83.80 | kJ/mol | 537.00 | NIST Webbook |
| pvap | 1.33 | kPa | 496.70 | Vapor pressure data for fatty acids obtained using an adaptation of the DSC technique |
| pvap | 2.67 | kPa | 513.10 | Vapor pressure data for fatty acids obtained using an adaptation of the DSC technique |
| pvap | 4.00 | kPa | 524.70 | Vapor pressure data for fatty acids obtained using an adaptation of the DSC technique |
| pvap | 5.33 | kPa | 532.10 | Vapor pressure data for fatty acids obtained using an adaptation of the DSC technique |
| pvap | 6.67 | kPa | 538.80 | Vapor pressure data for fatty acids obtained using an adaptation of the DSC technique |
| pvap | 8.00 | kPa | 543.80 | Vapor pressure data for fatty acids obtained using an adaptation of the DSC technique |
| pvap | 9.33 | kPa | 547.40 | Vapor pressure data for fatty acids obtained using an adaptation of the DSC technique |

# Pressure Dependent Properties

| Property code | Value | Unit | Pressure [kPa] | Source |
|---|---|---|---|---|
| tbrp | 467.70 | K | 0.10 | NIST Webbook |

# Correlations

| Information | Value |
|---|---|
| Property code | pvap |
| Equation | ln(Pvp) = A + B/(T + C) |
| Coeff. A | 1.52924e+01 |
| Coeff. B | -5.81882e+03 |
| Coeff. C | -1.25923e+02 |
| Temperature range (K), min. | 514.15 |
| Temperature range (K), max. | 709.15 |

# Sources

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|---|---|
| **Joback Method:** | https://en.wikipedia.org/wiki/Joback_method |
| **Crippen Method:** | https://www.chemeo.com/doc/models/crippen_log10ws |
| **High-Pressure Phase Equilibria of the Ternary System Oleic Acid + Squalene + Carbon Dioxide:** | https://www.doi.org/10.1021/je060459u |
| **Vapor pressure data for fatty acids obtained using an adaptation of the DSC technique:** | https://www.doi.org/10.1016/j.tca.2012.07.034 |
| **Activity coefficient at infinite dilution measurements for organic solutes (polar and nonpolar) in fatty** | https://www.doi.org/10.1016/j.jct.2012.12.009 |
| **Vapor Liquid Equilibrium Data for Carbon Dioxide + (R,S)-1,2-Isopropylidene Glycerol (Solketal) + Oleic Acid Systems at High Pressures: Binary and Ternary Systems:** | https://www.doi.org/10.1021/je401051d |
| **Compounds. Part II: C18 fatty acids: solubility of squalene and fatty acids in carbon dioxide at supercritical conditions:** | https://www.doi.org/10.1021/acs.jced.7b00620 |
| **Discussion of Fatty Mixtures:** | https://www.doi.org/10.1021/je700293s |
| **Experimental Data and Prediction: Binary, ternary and quaternary liquid liquid equilibria in 1-butanol, oleic acid, water and n-heptane mixtures:** | https://www.doi.org/10.1016/j.fluid.2009.06.013 |
| **Vapor Liquid Equilibrium of Carbon Dioxide + Ethyl Acetate + Oleic Acid Mixtures at High Pressures:** | https://www.doi.org/10.1021/acs.jced.7b00163 |
| **McGowan Method:** | http://link.springer.com/article/10.1007/BF02311772 |
| **The Yaws Handbook of Vapor Pressure:** | https://www.sciencedirect.com/book/9780128029992/the-yaws-handbook-of-vapor-pressure |
| **Solid-Liquid Equilibria in Fatty Acid/Triglycerol Systems:** | https://www.doi.org/10.1021/je101092j |
| **Physical properties of systems of interest to the edible oil industry:** | https://www.doi.org/10.1016/j.jct.2017.06.012 |
| **Vaporization, Sublimation and Fusion Enthalpies of Some Saturated and** | https://www.doi.org/10.1021/je5009729 |
| **Viscosities and densities of model systems formed by (triacylglycerol + fatty acid + solvent):** | |
| **Crippen Method:** | http://pubs.acs.org/doi/abs/10.1021/ci990307l |
| **Correlation Gas Chromatography:** | |

| | |
|---|---|
| **NIST Webbook:** | http://webbook.nist.gov/cgi/cbook.cgi?ID=C112801&Units=SI |
| **Liquid Liquid Equilibrium for Ternary Systems Containing Water, Oleic Acid, and Alcohols at 313.15 K: Effect of Alcohol Chain Length:** | https://www.doi.org/10.1021/je501174y |
| **Hydrogen solubility in triolein and propane solubility in oleic acid for second generation BDF synthesis by use of hydrodeoxygenation reaction:** | https://www.doi.org/10.1016/j.fluid.2013.11.006 |

# Legend

| | |
|---|---|
| **chl:** | Standard liquid enthalpy of combustion |
| **cpg:** | Ideal gas heat capacity |
| **dvisc:** | Dynamic viscosity |
| **gf:** | Standard Gibbs free energy of formation |
| **hf:** | Enthalpy of formation at standard conditions |
| **hfl:** | Liquid phase enthalpy of formation at standard conditions |
| **hfus:** | Enthalpy of fusion at standard conditions |
| **hfust:** | Enthalpy of fusion at a given temperature |
| **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 |
| **rinpol:** | Non-polar retention indices |
| **ripol:** | Polar retention indices |
| **tb:** | Normal Boiling Point Temperature |
| **tbrp:** | Boiling point at reduced pressure |
| **tc:** | Critical Temperature |
| **tf:** | Normal melting (fusion) point |
| **vc:** | Critical Volume |