Methyl methacrylate

Other names:	2-(Methoxycarbonyl)-1-propene
	2-Methyl-2-propenoic acid methyl ester
	2-Methylacrylic acid, methyl ester
	2-Methylacrylic, methyl ester
	2-Propenoic acid, 2-methyl-, methyl ester
	2-methylpropenoic acid, methyl ester
	Acryester M
	Acrylic acid, 2-methyl-, methyl ester
	CH2=C(CH3)COOCH3
	Diakon
	MMA
	Metakrylan metylu
	Methacrylate de methyle
	Methacrylic acid methyl ester
	Methacrylsaeuremethyl ester
	Methyl 2-methyl-2-propenoate
	Methyl 2-methylpropenoate
	Methyl ester of 2-methyl-2-propenoic acid
	Methyl methacrylate monomer
	Methyl methylacrylate
	Methyl «alpha»-methylacrylate
	Methyl Â«alphaÂ»-methylacrylate
	Methyl-methacrylat
	Methyl-«alpha»-methacrylate
	Methyl-Â«alphaÂ»-methacrylate
	Methylester kyseliny methakrylove
	Methylmethacrylaat
	Metil metacrilato
	Monocite methacrylate monomer
	NCI-C50680
	NSC 4769
	Paladon
	Pegalan
	Rcra waste number U162
	TEB 3K
	methacrylic acid, methyl ester
Inchi:	InChI=1S/C5H8O2/c1-4(2)5(6)7-3/h1H2,2-3H3
InchiKey:	VVQNEPGJFQJSBK-UHFFFAOYSA-N
Formula:	C5H8O2
SMILES:	C=C(C)C(=O)OC

Mol. weight [g/mol]: 100.12
CAS: 80-62-6

Physical Properties

Property code	Value	Unit	Source
affp	831.40	kJ/mol	NIST Webbook
basg	800.50	kJ/mol	NIST Webbook
chl	-2724.60 ± 4.00	kJ/mol	NIST Webbook
gf	-163.41	kJ/mol	Joback Method
hf	-331.00	kJ/mol	NIST Webbook
hf	-348.70	kJ/mol	NIST Webbook
hf	-342.30	kJ/mol	NIST Webbook
hfl	-382.40	kJ/mol	NIST Webbook
hfl	-388.80 ± 4.00	kJ/mol	NIST Webbook
hfus	8.90	kJ/mol	Joback Method
hvap	40.10	kJ/mol	NIST Webbook
ie	10.28	eV	NIST Webbook
ie	10.06	eV	NIST Webbook
ie	9.70	eV	NIST Webbook
log10ws	-0.80		Aqueous Solubility Prediction Method
logp	0.735		Crippen Method
mcvol	84.450	ml/mol	McGowan Method
pc	3881.95	kPa	Joback Method
rinpol	677.00		NIST Webbook
rinpol	716.28		NIST Webbook
rinpol	713.44		NIST Webbook
rinpol	696.00		NIST Webbook
rinpol	700.00		NIST Webbook
rinpol	694.00		NIST Webbook
rinpol	666.00		NIST Webbook
rinpol	670.00		NIST Webbook
rinpol	717.33		NIST Webbook
rinpol	677.00		NIST Webbook
rinpol	677.00		NIST Webbook
rinpol	677.00		NIST Webbook
rinpol	714.30		NIST Webbook
rinpol	732.00		NIST Webbook
rinpol	710.40		NIST Webbook
rinpol	723.00		NIST Webbook

rinpol	672.00		NIST Webbook
rinpol	710.00		NIST Webbook
rinpol	696.00		NIST Webbook
rinpol	714.00		NIST Webbook
rinpol	699.00		NIST Webbook
rinpol	696.00		NIST Webbook
rinpol	696.00		NIST Webbook
rinpol	699.00		NIST Webbook
rinpol	677.00		NIST Webbook
rinpol	699.00		NIST Webbook
rinpol	677.00		NIST Webbook
rinpol	732.00		NIST Webbook
rinpol	699.00		NIST Webbook
ripol	1002.00		NIST Webbook
ripol	1002.00		NIST Webbook
ripol	1010.00		NIST Webbook
ripol	1008.00		NIST Webbook
ripol	1008.00		NIST Webbook
sl	266.20	J/mol×K	NIST Webbook
tb	386.65	K	Joback Method
tc	572.77	K	Joback Method
tf	225.26	K	Aqueous Solubility Prediction Method
tf	225.60	K	NIST Webbook
tf	225.15 ± 0.40	K	NIST Webbook
tf	225.00	K	NIST Webbook
tf	225.60 ± 0.20	K	NIST Webbook
tf	225.50 ± 0.20	K	NIST Webbook
tf	225.60	K	NIST Webbook
tt	225.59 ± 0.02	K	NIST Webbook
vc	0.322	m3/kmol	Joback Method

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	192.58	J/mol×K	572.77	Joback Method
cpg	164.83	J/mol×K	448.69	Joback Method
cpg	157.23	J/mol×K	417.67	Joback Method
cpg	149.36	J/mol×K	386.65	Joback Method
cpg	172.17	J/mol×K	479.71	Joback Method
cpg	186.04	J/mol×K	541.75	Joback Method

cpg	179.24	J/mol×K	510.73	Joback Method
cpl	215.30	J/mol×K	298.15	NIST Webbook
cpl	210.55	J/mol×K	298.15	NIST Webbook
cpl	188.49	J/mol×K	293.00	NIST Webbook
cpl	192.40	J/mol×K	300.00	NIST Webbook
cpl	215.30	J/mol×K	298.15	NIST Webbook
cpl	191.09	J/mol×K	298.15	NIST Webbook
cps	150.20	J/mol×K	210.00	NIST Webbook
dvisc	0.0005540	Pa×s	298.15	Density, Excess Molar Volume, and Viscosity for the Methyl Methacrylate + 1-Butyl-3-methylimidazolium Hexafluorophosphate Ionic Liquid Binary System at Atmospheric Pressure
dvisc	0.0004497	Pa×s	318.15	Excess Molar Volume and Viscosity Deviation for the Methanol + Methyl Methacrylate Binary System at T) (283.15 to 333.15) K
dvisc	0.0004294	Pa×s	323.15	Excess Molar Volume and Viscosity Deviation for the Methanol + Methyl Methacrylate Binary System at T) (283.15 to 333.15) K
dvisc	0.0004100	Pa×s	328.15	Excess Molar Volume and Viscosity Deviation for the Methanol + Methyl Methacrylate Binary System at T) (283.15 to 333.15) K
dvisc	0.0004719	Pa×s	313.15	Excess Molar Volume and Viscosity Deviation for the Methanol + Methyl Methacrylate Binary System at T) (283.15 to 333.15) K

dvisc	0.0006808	Pa×s	283.15	Density, Excess Molar Volume, and Viscosity for the Methyl Methacrylate + 1-Butyl-3-methylimidazolium Hexafluorophosphate Ionic Liquid Binary System at Atmospheric Pressure
dvisc	0.0006337	Pa×s	288.15	Density, Excess Molar Volume, and Viscosity for the Methyl Methacrylate + 1-Butyl-3-methylimidazolium Hexafluorophosphate Ionic Liquid Binary System at Atmospheric Pressure
dvisc	0.0005899	Pa×s	293.15	Density, Excess Molar Volume, and Viscosity for the Methyl Methacrylate + 1-Butyl-3-methylimidazolium Hexafluorophosphate Ionic Liquid Binary System at Atmospheric Pressure
dvisc	0.0004956	Pa×s	308.15	Excess Molar Volume and Viscosity Deviation for the Methanol + Methyl Methacrylate Binary System at T) (283.15 to 333.15) K
dvisc	0.0005248	Pa×s	303.15	Density, Excess Molar Volume, and Viscosity for the Methyl Methacrylate + 1-Butyl-3-methylimidazolium Hexafluorophosphate Ionic Liquid Binary System at Atmospheric Pressure

dvisc	0.0004956	Pa×s	308.15	Density, Excess Molar Volume, and Viscosity for the Methyl Methacrylate + 1-Butyl-3-methylimidazolium Hexafluorophosphate Ionic Liquid Binary System at Atmospheric Pressure
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dvisc	0.0004100	Pa×s	328.15	Density, Excess Molar Volume, and Viscosity for the Methyl Methacrylate + 1-Butyl-3-methylimidazolium Hexafluorophosphate Ionic Liquid Binary System at Atmospheric Pressure

dvisc	0.0003938	Pa×s	333.15	Density, Excess Molar Volume, and Viscosity for the Methyl Methacrylate + 1-Butyl-3-methylimidazolium Hexafluorophosphate Ionic Liquid Binary System at Atmospheric Pressure
dvisc	0.0003636	Pa×s	343.15	Density, Excess Molar Volume, and Viscosity for the Methyl Methacrylate + 1-Butyl-3-methylimidazolium Hexafluorophosphate Ionic Liquid Binary System at Atmospheric Pressure
dvisc	0.0003398	Pa×s	353.15	Density, Excess Molar Volume, and Viscosity for the Methyl Methacrylate + 1-Butyl-3-methylimidazolium Hexafluorophosphate Ionic Liquid Binary System at Atmospheric Pressure
dvisc	0.0005540	Pa×s	298.15	Excess Molar Volume and Viscosity Deviation for the Methanol + Methyl Methacrylate Binary System at T) (283.15 to 333.15) K
dvisc	0.0005899	Pa×s	293.15	Excess Molar Volume and Viscosity Deviation for the Methanol + Methyl Methacrylate Binary System at T) (283.15 to 333.15) K
dvisc	0.0006337	Pa×s	288.15	Excess Molar Volume and Viscosity Deviation for the Methanol + Methyl Methacrylate Binary System at T) (283.15 to 333.15) K

dvisc	0.0004294	Pa×s	323.15	Density, Excess Molar Volume, and Viscosity for the Methyl Methacrylate + 1-Butyl-3-methylimidazolium Hexafluorophosphate Ionic Liquid Binary System at Atmospheric Pressure
dvisc	0.0003938	Pa×s	333.15	Excess Molar Volume and Viscosity Deviation for the Methanol + Methyl Methacrylate Binary System at T) (283.15 to 333.15) K
dvisc	0.0006808	Pa×s	283.15	Excess Molar Volume and Viscosity Deviation for the Methanol + Methyl Methacrylate Binary System at T) (283.15 to 333.15) K
hfust	13.45	kJ/mol	225.50	NIST Webbook
hfust	14.44	kJ/mol	225.59	NIST Webbook
hfust	12.24	kJ/mol	225.00	NIST Webbook
hfust	12.24	kJ/mol	225.00	NIST Webbook
hsubt	60.70	kJ/mol	208.50	NIST Webbook
hvapt	38.80 ± 0.10	kJ/mol	340.50	NIST Webbook
hvapt	36.30 ± 0.20	kJ/mol	340.50	NIST Webbook
hvapt	33.30 ± 0.40	kJ/mol	340.50	NIST Webbook
hvapt	37.90	kJ/mol	333.00	NIST Webbook
hvapt	38.00	kJ/mol	339.00	NIST Webbook
hvapt	37.70	kJ/mol	333.00	NIST Webbook
hvapt	39.00	kJ/mol	337.00	NIST Webbook
rhol	914.67	kg/m3	318.15	Densities, ultrasonic speeds, excess and partial molar properties of binary mixtures of acetonitrile with some alkyl methacrylates at temperatures from 293.15 K to 318.15 K

rhol	926.16	kg/m3	308.15	Densities, ultrasonic speeds, excess and partial molar properties of binary mixtures of acetonitrile with some alkyl methacrylates at temperatures from 293.15 K to 318.15 K	
rhol	931.90	kg/m3	303.15	Densities, ultrasonic speeds, excess and partial molar properties of binary mixtures of acetonitrile with some alkyl methacrylates at temperatures from 293.15 K to 318.15 K	
rhol	937.64	kg/m3	298.15	Densities, ultrasonic speeds, excess and partial molar properties of binary mixtures of acetonitrile with some alkyl methacrylates at temperatures from 293.15 K to 318.15 K	
rhol	920.42	kg/m3	313.15	Densities, ultrasonic speeds, excess and partial molar properties of binary mixtures of acetonitrile with some alkyl methacrylates at temperatures from 293.15 K to 318.15 K	
rhol	943.38	kg/m3	293.15	Densities, ultrasonic speeds, excess and partial molar properties of binary mixtures of acetonitrile with some alkyl methacrylates at temperatures from 293.15 K to 318.15 K	

rhol	937.63	kg/m3	298.15	Volumetric Properties of 3-Methylbutyl Ethanoate with Ethyl Acrylate, Butyl Acrylate, Methyl Methacrylate, and Styrene at 25 C
rhol	937.65	kg/m3	298.15	Densities and volumes of mixing of the ternary system toluene + butyl acrylate + methyl methacrylate and its binaries at 298.15 K
rhol	949.10	kg/m3	288.15	Densities, ultrasonic speeds, viscosities and excess properties of binary mixtures of methyl methacrylate with N,N-dimethylformamide and N,N-dimethylacetamide at different temperatures
rhol	943.37	kg/m3	293.15	Densities, ultrasonic speeds, viscosities and excess properties of binary mixtures of methyl methacrylate with N,N-dimethylformamide and N,N-dimethylacetamide at different temperatures
rhol	937.63	kg/m3	298.15	Densities, ultrasonic speeds, viscosities and excess properties of binary mixtures of methyl methacrylate with N,N-dimethylformamide and N,N-dimethylacetamide at different temperatures

rhol	931.89	kg/m3	303.15	Densities, ultrasonic speeds, viscosities and excess properties of binary mixtures of methyl methacrylate with N,N-dimethylformamide and N,N-dimethylacetamide at different temperatures
rhol	914.66	kg/m3	318.15	Densities, ultrasonic speeds, viscosities and excess properties of binary mixtures of methyl methacrylate with N,N-dimethylformamide and N,N-dimethylacetamide at different temperatures
rhol	920.41	kg/m3	313.15	Densities, ultrasonic speeds, viscosities and excess properties of binary mixtures of methyl methacrylate with N,N-dimethylformamide and N,N-dimethylacetamide at different temperatures
rhol	926.15	kg/m3	308.15	Densities, ultrasonic speeds, viscosities and excess properties of binary mixtures of methyl methacrylate with N,N-dimethylformamide and N,N-dimethylacetamide at different temperatures
sfust	59.65	J/mol×K	225.50	NIST Webbook
sfust	64.00	J/mol×K	225.59	NIST Webbook

speedsl	1153.00	m/s	308.15	Densities, Excess Molar Volumes at T = (298.15 to 313.15) K, Speeds of Sound, Excess Isentropic Compressibilities, Relative Permittivities and Deviations in Molar Polarizations at T = (298.15 and 308.15) K for Methyl Methacrylate + 2-Butoxyethanol or + Dibutyl Ether + Benzene, + Toluene and + p-Xylene
speedsl	1182.00	m/s	298.15	Densities, Speeds of Sound, Excess Molar Volumes, and Excess Isentropic Compressibilities at T = (298.15 and 308.15) K for Methyl Methacrylate + 1-Alkanols (1-Butanol, 1-Pentanol, and 1-Heptanol) + Cyclohexane, + Benzene, + Toluene, + p-Xylene, and + Ethylbenzene
speedsl	1152.00	m/s	308.15	Densities, Speeds of Sound, Excess Molar Volumes, and Excess Isentropic Compressibilities at T = (298.15 and 308.15) K for Methyl Methacrylate + 1-Alkanols (1-Butanol, 1-Pentanol, and 1-Heptanol) + Cyclohexane, + Benzene, + Toluene, + p-Xylene, and + Ethylbenzene

speedsl	1181.00	m/s	298.15	Densities, Excess Molar Volumes at T = (298.15 to 313.15) K, Speeds of Sound, Excess Isentropic Compressibilities, Relative Permittivities and Deviations in Molar Polarizations at T = (298.15 and 308.15) K for Methyl Methacrylate + 2-Butoxyethanol or + Dibutyl Ether + Benzene, + Toluene and + p-Xylene

Correlations

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/T + C*ln(T) + D*T^2
Coeff. A	1.28053e+02
Coeff. B	-8.95480e+03
Coeff. C	-1.71457e+01
Coeff. D	1.47176e-05
Temperature range (K), min.	224.95
Temperature range (K), max.	564.00

Sources

KDB Vapor Pressure Data:	https://www.cheric.org/research/kdb/hcprop/showprop.php?cmpid=1171
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C80626&Units=SI
Liquid-Liquid Equilibria for the Ternary Systems Water + 2-Propanol + Methyl Methacrylate, + Butyl Methacrylate, and + Isobutyl Methacrylate:	https://www.doi.org/10.1021/je700118q
Volumetric Properties of 3-Methylbutyl Ethanoate with Ethyl Acrylate, Butyl Acrylate, Methyl Methacrylate, and Styrene at 25 °C:	https://www.doi.org/10.1007/s10765-005-5571-9
Densities, ultrasonic speeds, excess and partial molar properties of binary mixtures of acetonitrile with some alkyl methacrylates at temperatures from 293.15 K to 318.15 K:	https://www.doi.org/10.1016/j.jct.2018.03.013
Liquid-liquid equilibria of water + 1-butanol + methyl methacrylate or butyl methacrylate or isobutyl methacrylate at 288.15K and 318.15K:	https://www.doi.org/10.1016/j.fluid.2007.07.011
McGowan Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l
Densities, ultrasonic speeds, viscosities and excess properties of binary mixtures of methyl methacrylate with N,N-dimethylformamide and N,N-dimethylacetamide at different temperatures:	https://www.doi.org/10.1016/j.jct.2013.01.013

Methyl Methacrylate + Carbon Dioxide Phase Equilibria at High Pressures:	https://www.doi.org/10.1021/je049639z
Excess Molar Volume and Viscosity Deviation for the Methanol + Methyl Methacrylate Binary System at (288.15 to 333.15) K:	https://www.doi.org/10.1021/je800164w
Liquid-liquid equilibria for systems of water + methanol + methyl anthranilate at several temperatures:	https://www.doi.org/10.1016/j.fluid.2011.07.008
Aqueous Solubility Prediction Method:	http://onschallenge.wikispaces.com/file/view/AqueousDataset002.xlsx/351826032/AqueousDa
Densities and volumes of mixing of the ternary system toluene + butyl acrylate + methylmethacrylate and its binaries at 298.15 K:	https://www.doi.org/10.1016/j.jct.2006.05.012
Liquid-liquid equilibria for the ternary system water + 1-propanol + methyl methacrylate, + butyl methacrylate, and + isobutyl methacrylate:	https://www.doi.org/10.1016/j.fluid.2007.05.018
Densities, speeds of sound and excess properties of (benzonitrile + methyl methacrylate or + ethyl methacrylate, or + n-butyl methacrylate) binary mixtures at temperatures from 293.15 K to 313.15 K:	https://www.doi.org/10.1016/j.jct.2018.12.031
Determination of Henry's Law Constants Using Internal Standards and Gas Chromatography:	https://www.doi.org/10.1021/je3010535
Liquid-Liquid Equilibria of Water + 2-Butanol + (Methyl Methacrylate or Butyl Methacrylate or Isobutyl Methacrylate) at (293.2 or 313.2) K:	https://www.doi.org/10.1021/je7002572
Phase Behavior Studies of Methoxyethyl Methacrylate and Methyl Methacrylate in High Pressure Carbon Dioxide:	https://www.doi.org/10.1021/je700272y
Density, Excess Molar Volume, and Viscosity for the Methyl Methacrylate + 1-Butyl-3-methylimidazolium Hexafluorophosphate Ionic Liquid Binary System at Atmospheric Pressure:	https://www.doi.org/10.1021/je900091b
McGowan's Method:	http://link.springer.com/article/10.1007/BF02311772
CDB:	https://www.cheric.org/files/research/kdb/mol/mol1171.mol
Joback Method:	https://en.wikipedia.org/wiki/Joback_method
Densities, Excess Molar Volumes at T = (298.15 to 313.15) K, Speeds of Sound, Excess Isentropic Compressibilities, Relative Permittivities and Deviations in Molar Polarizations at T = (298.15 and 308.15) K for Methyl Methacrylate + 2-Butoxyethanol or + Dibutyl Ether + Benzene, + Toluene and + p-Xylene:	https://www.doi.org/10.1021/je034022n
Combined effects of salinity and temperature on the solubility of organic pollutants: Speeds of Sound, Excess Molar Volumes, and Excess Isentropic Compressibilities at T = (298.15 and 308.15) K for Methyl Methacrylate + 1-Alkanols (1-Butanol, 1-Pentanol, and 1-Heptanol) + Cyclohexane, + Benzene, + Toluene, + p-Xylene, and + Ethylbenzene:	https://www.doi.org/10.1016/j.jct.2011.11.020
	https://www.doi.org/10.1021/je100652b

Legend

affp:	Proton affinity
basg:	Gas basicity
chl:	Standard liquid enthalpy of combustion
cpg:	Ideal gas heat capacity
cpl:	Liquid phase heat capacity
cps:	Solid phase 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
hsubt:	Enthalpy of sublimation at a given temperature
hvap:	Enthalpy of vaporization at standard conditions
hvapt:	Enthalpy of vaporization at a given temperature
ie:	Ionization energy
log10ws:	Log10 of Water solubility in mol/l
logp:	Octanol/Water partition coefficient
mcvol:	McGowan's characteristic volume
pc:	Critical Pressure
pvap:	Vapor pressure

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