# Propane, 1,1,3,3-tetraethoxy-

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|---|---|
| **Other names:** | Malonaldehyde, bis(diethyl acetal) |
| | Malonaldehyde tetraethyl acetal |
| | Malonaldehyde tetraethyl diacetal |
| | Malondialdehyde tetraethyl acetal |
| | 1,1,3,3-Tetraethoxypropane |
| | Tetraethyl malondialdehyde acetal |
| | Malondialdehyde bis(diethyl acetal) |
| | Malonaldehyde diethyl acetal |
| | Tetraethoxypropane |
| | USAF KF-26 |
| | NSC 17068 |
| **Inchi:** | InChI=1S/C11H24O4/c1-5-12-10(13-6-2)9-11(14-7-3)15-8-4/h10-11H,5-9H2,1-4H3 |
| **InchiKey:** | KVJHGPAAOUGYJX-UHFFFAOYSA-N |
| **Formula:** | C11H24O4 |
| **SMILES:** | CCOC(CC(OCC)OCC)OCC |
| **Mol. weight [g/mol]:** | 220.31 |
| **CAS:** | 122-31-6 |

# Physical Properties

| Property code | Value | Unit | Source |
|---|---|---|---|
| gf | -383.14 | kJ/mol | Joback Method |
| hf | -809.81 | kJ/mol | Joback Method |
| hfus | 21.95 | kJ/mol | Joback Method |
| hvap | 48.94 | kJ/mol | Joback Method |
| log10ws | -1.99 | | Crippen Method |
| logp | 2.175 | | Crippen Method |
| mcvol | 189.330 | ml/mol | McGowan Method |
| pc | 1848.33 | kPa | Joback Method |
| rinpol | 1304.00 | | NIST Webbook |
| ripol | 1347.00 | | NIST Webbook |
| tb | 493.20 | K | NIST Webbook |
| tc | 707.42 | K | Joback Method |
| tf | 272.65 | K | Joback Method |
| vc | 0.712 | m3/kmol | Joback Method |

# Temperature Dependent Properties

| Property code | Value | Unit | Temperature [K] | Source |
|---|---|---|---|---|
| cpg | 471.94 | J/mol×K | 539.88 | Joback Method |
| cpg | 487.68 | J/mol×K | 567.80 | Joback Method |
| cpg | 502.93 | J/mol×K | 595.73 | Joback Method |
| cpg | 517.70 | J/mol×K | 623.65 | Joback Method |
| cpg | 531.95 | J/mol×K | 651.57 | Joback Method |
| cpg | 545.69 | J/mol×K | 679.50 | Joback Method |
| cpg | 558.90 | J/mol×K | 707.42 | Joback Method |
| dvisc | 0.0029033 | Pa×s | 272.65 | Joback Method |
| dvisc | 0.0010855 | Pa×s | 317.19 | Joback Method |
| dvisc | 0.0005171 | Pa×s | 361.73 | Joback Method |
| dvisc | 0.0002899 | Pa×s | 406.26 | Joback Method |
| dvisc | 0.0001822 | Pa×s | 450.80 | Joback Method |
| dvisc | 0.0001244 | Pa×s | 495.34 | Joback Method |
| dvisc | 0.0000905 | Pa×s | 539.88 | Joback Method |

# Sources

**Crippen Method:** http://pubs.acs.org/doi/abs/10.1021/ci990307l
**Crippen Method:** https://www.chemeo.com/doc/models/crippen_log10ws
**Joback Method:** https://en.wikipedia.org/wiki/Joback_method
**McGowan Method:** http://link.springer.com/article/10.1007/BF02311772
**NIST Webbook:** http://webbook.nist.gov/cgi/cbook.cgi?ID=C122316&Units=SI

# Legend

**cpg:** Ideal gas 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
**hvap:** Enthalpy of vaporization at standard conditions
**log10ws:** Log10 of Water solubility in mol/l
**logp:** Octanol/Water partition coefficient

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|---|---|
| **mcvol:** | McGowan's characteristic volume |
| **pc:** | Critical Pressure |
| **rinpol:** | Non-polar retention indices |
| **ripol:** | Polar retention indices |
| **tb:** | Normal Boiling Point Temperature |
| **tc:** | Critical Temperature |
| **tf:** | Normal melting (fusion) point |
| **vc:** | Critical Volume |