# 2-Norbornene

| | |
|---|---|
| **Other names:** | 2-Norbornylene |
| | 3,6-Endomethylenecyclohexene |
| | 8,9,10-trinor-2-bornene |
| | 8,9,10-trinorborn-2-ene |
| | Bicyclo[2.2.1]-2-heptene |
| | Bicyclo[2.2.1]hept-2-ene |
| | Bicyclo[2.2.1]heptene |
| | NSC 120425 |
| | Norbornene |
| | Norbornylene |
| | Norcamphene |
| | Norfenchene |
| **Inchi:** | InChI=1S/C7H10/c1-2-7-4-3-6(1)5-7/h1-2,6-7H,3-5H2 |
| **InchiKey:** | JFNLZVQOOSMTJK-UHFFFAOYSA-N |
| **Formula:** | C7H10 |
| **SMILES:** | C1=CC2CCC1C2 |
| **Mol. weight [g/mol]:** | 94.15 |
| **CAS:** | 498-66-8 |

# Physical Properties

| Property code | Value | Unit | Source |
|---|---|---|---|
| affp | 836.50 | kJ/mol | NIST Webbook |
| basg | 804.00 | kJ/mol | NIST Webbook |
| chl | -4213.00 ± 2.00 | kJ/mol | NIST Webbook |
| chs | -4237.20 ± 3.20 | kJ/mol | NIST Webbook |
| chs | -4225.10 ± 1.30 | kJ/mol | NIST Webbook |
| chs | -4228.20 ± 2.00 | kJ/mol | NIST Webbook |
| gf | 147.42 | kJ/mol | Joback Method |
| hf | 85.40 | kJ/mol | NIST Webbook |
| hf | 88.40 ± 2.70 | kJ/mol | NIST Webbook |
| hf | 63.30 ± 1.80 | kJ/mol | NIST Webbook |
| hf | 121.00 | kJ/mol | NIST Webbook |
| hf | 90.60 ± 3.40 | kJ/mol | NIST Webbook |
| hf | 82.60 ± 2.10 | kJ/mol | NIST Webbook |
| hf | 80.10 ± 1.50 | kJ/mol | NIST Webbook |
| hf | 89.50 | kJ/mol | NIST Webbook |
| hfl | 29.70 ± 1.70 | kJ/mol | NIST Webbook |

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|---|---|---|---|
| hfs | 41.40 ± 1.40 | kJ/mol | NIST Webbook |
| hfs | 53.50 ± 3.20 | kJ/mol | NIST Webbook |
| hfs | 44.40 ± 2.00 | kJ/mol | NIST Webbook |
| hfus | 9.28 | kJ/mol | Joback Method |
| hsub | 38.20 | kJ/mol | NIST Webbook |
| hsub | 37.10 | kJ/mol | NIST Webbook |
| hsub | 37.80 ± 0.90 | kJ/mol | NIST Webbook |
| hsub | 37.80 ± 0.14 | kJ/mol | NIST Webbook |
| hsub | 37.70 ± 0.90 | kJ/mol | NIST Webbook |
| hsub | 38.70 ± 0.54 | kJ/mol | NIST Webbook |
| hsub | 38.70 | kJ/mol | NIST Webbook |
| hsub | 37.84 ± 0.14 | kJ/mol | NIST Webbook |
| hsub | 38.20 ± 0.20 | kJ/mol | NIST Webbook |
| hsub | 38.70 ± 0.50 | kJ/mol | NIST Webbook |
| hvap | 35.10 ± 0.20 | kJ/mol | NIST Webbook |
| hvap | 33.60 | kJ/mol | NIST Webbook |
| hvap | 33.60 ± 0.08 | kJ/mol | NIST Webbook |
| ie | 9.00 ± 0.10 | eV | NIST Webbook |
| ie | 8.97 | eV | NIST Webbook |
| ie | 8.60 | eV | NIST Webbook |
| ie | 8.95 | eV | NIST Webbook |
| ie | 8.97 | eV | NIST Webbook |
| ie | 8.83 | eV | NIST Webbook |
| ie | 8.97 | eV | NIST Webbook |
| ie | 8.95 | eV | NIST Webbook |
| ie | 8.80 ± 0.01 | eV | NIST Webbook |
| ie | 8.81 ± 0.02 | eV | NIST Webbook |
| ie | 8.82 | eV | NIST Webbook |
| ie | 9.20 | eV | NIST Webbook |
| ie | 9.05 | eV | NIST Webbook |
| ie | 8.95 ± 0.15 | eV | NIST Webbook |
| ie | 8.97 | eV | NIST Webbook |
| ie | 8.97 | eV | NIST Webbook |
| log10ws | -1.91 | | Crippen Method |
| logp | 1.973 | | Crippen Method |
| mcvol | 83.470 | ml/mol | McGowan Method |
| pc | 4860.00 ± 250.00 | kPa | NIST Webbook |
| rhoc | 299.50 ± 14.12 | kg/m3 | NIST Webbook |
| rinpol | 721.20 | | NIST Webbook |
| rinpol | 699.00 | | NIST Webbook |
| rinpol | 720.00 | | NIST Webbook |
| rinpol | 715.00 | | NIST Webbook |
| rinpol | 710.00 | | NIST Webbook |
| rinpol | 704.00 | | NIST Webbook |

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|---|---|---|---|
| rinpol | 727.00 | | NIST Webbook |
| rinpol | 706.70 | | NIST Webbook |
| rinpol | 726.00 | | NIST Webbook |
| rinpol | 716.00 | | NIST Webbook |
| rinpol | 699.00 | | NIST Webbook |
| rinpol | 731.00 | | NIST Webbook |
| rinpol | 731.00 | | NIST Webbook |
| rinpol | 735.20 | | NIST Webbook |
| rinpol | 741.10 | | NIST Webbook |
| rinpol | 714.60 | | NIST Webbook |
| rinpol | 726.00 | | NIST Webbook |
| tb | 368.87 ± 0.30 | K | NIST Webbook |
| tb | 369.20 | K | NIST Webbook |
| tc | 590.00 ± 2.00 | K | NIST Webbook |
| tf | 319.00 ± 0.10 | K | NIST Webbook |
| tf | 317.30 ± 0.30 | K | NIST Webbook |
| tf | 318.90 ± 0.20 | K | NIST Webbook |
| tt | 319.50 ± 1.00 | K | NIST Webbook |
| vc | 0.320 | m3/kmol | Joback Method |

# Temperature Dependent Properties

| Property code | Value | Unit | Temperature [K] | Source |
|---|---|---|---|---|
| cpg | 147.84 | J/mol×K | 376.47 | Joback Method |
| cpg | 162.81 | J/mol×K | 410.66 | Joback Method |
| cpg | 176.76 | J/mol×K | 444.84 | Joback Method |
| cpg | 189.74 | J/mol×K | 479.03 | Joback Method |
| cpg | 201.82 | J/mol×K | 513.22 | Joback Method |
| cpg | 213.06 | J/mol×K | 547.41 | Joback Method |
| cpg | 223.52 | J/mol×K | 581.59 | Joback Method |
| cps | 129.90 | J/mol×K | 298.15 | NIST Webbook |
| cps | 129.90 | J/mol×K | 297.00 | NIST Webbook |
| dvisc | 0.0004074 | Pa×s | 376.47 | Joback Method |
| dvisc | 0.0004471 | Pa×s | 230.89 | Joback Method |
| dvisc | 0.0004352 | Pa×s | 260.00 | Joback Method |
| dvisc | 0.0004629 | Pa×s | 201.77 | Joback Method |
| dvisc | 0.0004186 | Pa×s | 318.24 | Joback Method |
| dvisc | 0.0004125 | Pa×s | 347.35 | Joback Method |
| dvisc | 0.0004260 | Pa×s | 289.12 | Joback Method |
| hfust | 3.48 | kJ/mol | 319.50 | NIST Webbook |
| hfust | 4.27 | kJ/mol | 130.30 | NIST Webbook |

| | | | | |
|---|---|---|---|---|
| hfust | 3.48 | kJ/mol | 319.50 | NIST Webbook |
| hvapt | 33.00 ± 0.20 | kJ/mol | 372.00 | NIST Webbook |
| hvapt | 30.80 ± 0.30 | kJ/mol | 372.00 | NIST Webbook |
| hvapt | 34.30 | kJ/mol | 325.50 | NIST Webbook |
| sfust | 32.77 | J/mol×K | 130.30 | NIST Webbook |
| sfust | 10.89 | J/mol×K | 319.50 | NIST Webbook |

# Pressure Dependent Properties

| Property code | Value | Unit | Pressure [kPa] | Source |
|---|---|---|---|---|
| tbrp | 368.50 ± 1.50 | K | 98.70 | NIST Webbook |

# Correlations

| Information | Value |
|---|---|
| Property code | pvap |
| Equation | ln(Pvp) = A + B/(T + C) |
| Coeff. A | 1.39662e+01 |
| Coeff. B | -3.11661e+03 |
| Coeff. C | -3.52470e+01 |
| Temperature range (K), min. | 263.09 |
| Temperature range (K), max. | 395.35 |

# Sources

| | |
|---|---|
| **Crippen Method:** | https://www.chemeo.com/doc/models/crippen_log10ws |
| **Solubility of ethylene in toluene, norbornene, and toluene + norbornene mixture:** | https://www.doi.org/10.1016/j.fluid.2013.01.023 |
| **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=C498668&Units=SI |
| **The Yaws Handbook of Vapor Pressure:** | https://www.sciencedirect.com/book/9780128029992/the-yaws-handbook-of-vapor-pressure |
| **Crippen Method:** | http://pubs.acs.org/doi/abs/10.1021/ci990307l |

# Legend

| | |
|---|---|
| **affp:** | Proton affinity |
| **basg:** | Gas basicity |
| **chl:** | Standard liquid enthalpy of combustion |
| **chs:** | Standard solid enthalpy of combustion |
| **cpg:** | Ideal gas 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 |
| **hfs:** | Solid phase enthalpy of formation at standard conditions |
| **hfus:** | Enthalpy of fusion at standard conditions |
| **hfust:** | Enthalpy of fusion at a given temperature |
| **hsub:** | Enthalpy of sublimation at standard conditions |
| **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 |
| **rhoc:** | Critical density |
| **rinpol:** | Non-polar retention indices |
| **sfust:** | Entropy of fusion at a given temperature |
| **tb:** | Normal Boiling Point Temperature |
| **tbrp:** | Boiling point at reduced pressure |
| **tc:** | Critical Temperature |
| **tf:** | Normal melting (fusion) point |
| **tt:** | Triple Point Temperature |
| **vc:** | Critical Volume |

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