

# Isobutane

|                      |                                                                                                                                                                                                       |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Other names:         | 1,1-DIMETHYLETHANE<br>2-METHYLPROPANE<br>A 31<br>A 31 (hydrocarbon)<br>Methylpropane<br>Propane, 2-methyl-<br>R 600a<br>R-600a<br>TRIMETHYLMETHANE<br>UN 1969<br>i-Butane<br>iso-C4H10<br>tert-Butane |
| Inchi:               | InChI=1S/C4H10/c1-4(2)3/h4H,1-3H3                                                                                                                                                                     |
| InchiKey:            | NNPPMTNAJDCUHE-UHFFFAOYSA-N                                                                                                                                                                           |
| Formula:             | C4H10                                                                                                                                                                                                 |
| SMILES:              | CC(C)C                                                                                                                                                                                                |
| Mol. weight [g/mol]: | 58.12                                                                                                                                                                                                 |
| CAS:                 | 75-28-5                                                                                                                                                                                               |

## Physical Properties

| Property code | Value           | Unit     | Source       |
|---------------|-----------------|----------|--------------|
| af            | 0.1830          |          | KDB          |
| affp          | 677.80          | kJ/mol   | NIST Webbook |
| aigt          | 749.82          | K        | KDB          |
| ap            | 380.750         | K        | KDB          |
| basg          | 671.30          | kJ/mol   | NIST Webbook |
| chg           | -2867.60 ± 0.46 | kJ/mol   | NIST Webbook |
| chg           | -2869.00 ± 0.59 | kJ/mol   | NIST Webbook |
| dm            | 0.10            | debye    | KDB          |
| fil           | 1.80            | % in Air | KDB          |
| flu           | 8.40            | % in Air | KDB          |
| fpo           | 190.37          | K        | KDB          |
| gf            | -20.90          | kJ/mol   | KDB          |
| gyrad         | 2.8960          |          | KDB          |
| hcg           | 2848.64         | kJ/mol   | KDB          |
| hcn           | 2628.598        | kJ/mol   | KDB          |

|         |                     |        |                                                                                                                                                                                    |
|---------|---------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| hf      | -135.60 ± 0.54      | kJ/mol | NIST Webbook                                                                                                                                                                       |
| hf      | -134.60             | kJ/mol | KDB                                                                                                                                                                                |
| hf      | -134.20 ± 0.63      | kJ/mol | NIST Webbook                                                                                                                                                                       |
| hfus    | 4.49                | kJ/mol | Molar Heat Capacity at Constant Volume for Isobutane at Temperatures from (114 to 345) K and at Pressures to 35 MPa                                                                |
| hvap    | 19.99               | kJ/mol | NIST Webbook                                                                                                                                                                       |
| ie      | 10.50               | eV     | NIST Webbook                                                                                                                                                                       |
| ie      | 10.68 ± 0.11        | eV     | NIST Webbook                                                                                                                                                                       |
| ie      | 10.57               | eV     | NIST Webbook                                                                                                                                                                       |
| ie      | 10.74 ± 0.05        | eV     | NIST Webbook                                                                                                                                                                       |
| ie      | 10.69               | eV     | NIST Webbook                                                                                                                                                                       |
| ie      | 11.40               | eV     | NIST Webbook                                                                                                                                                                       |
| ie      | 10.79               | eV     | NIST Webbook                                                                                                                                                                       |
| ie      | 10.78               | eV     | NIST Webbook                                                                                                                                                                       |
| ie      | 10.57               | eV     | NIST Webbook                                                                                                                                                                       |
| ie      | 11.00 ± 0.10        | eV     | NIST Webbook                                                                                                                                                                       |
| ie      | 11.13               | eV     | NIST Webbook                                                                                                                                                                       |
| log10ws | -2.55               |        | Aqueous Solubility Prediction Method                                                                                                                                               |
| log10ws | -2.55               |        | Estimated Solubility Method                                                                                                                                                        |
| logp    | 1.662               |        | Crippen Method                                                                                                                                                                     |
| mcvol   | 67.220              | ml/mol | McGowan Method                                                                                                                                                                     |
| nfpaf   | %!d(float64=4)      |        | KDB                                                                                                                                                                                |
| nfpah   | %!d(float64=1)      |        | KDB                                                                                                                                                                                |
| pc      | 3604.00             | kPa    | KDB                                                                                                                                                                                |
| pc      | 3620.00             | kPa    | Critical Temperatures and Pressures of Several Binary and Ternary Mixtures Concerning the Alkylation of 2-Methylpropane with 1-Butene in the Presence of Methane or Carbon Dioxide |
| pc      | 3633.00             | kPa    | Critical Properties of Three Dimethyl Ether Binary Systems: Dimethyl Ether (RE-170) + Propane (HC-290), Butane (HC-600), and 2-Methyl Propane (HC-600A)                            |
| pc      | 3639.00             | kPa    | Critical parameters for isobutane determined by the image analysis                                                                                                                 |
| pt      | 1.95e-05 ± 2.00e-08 | kPa    | NIST Webbook                                                                                                                                                                       |
| pt      | 1.95e-05 ± 5.00e-08 | kPa    | NIST Webbook                                                                                                                                                                       |
| rhoc    | 227.26 ± 5.23       | kg/m3  | NIST Webbook                                                                                                                                                                       |

|        |               |       |              |
|--------|---------------|-------|--------------|
| rhoc   | 220.98 ± 5.81 | kg/m3 | NIST Webbook |
| rhoc   | 224.36 ± 1.74 | kg/m3 | NIST Webbook |
| rhoc   | 225.51 ± 0.52 | kg/m3 | NIST Webbook |
| rhoc   | 223.77 ± 2.91 | kg/m3 | NIST Webbook |
| rinpol | 366.00        |       | NIST Webbook |
| rinpol | 364.00        |       | NIST Webbook |
| rinpol | 354.00        |       | NIST Webbook |
| rinpol | 353.00        |       | NIST Webbook |
| rinpol | 355.00        |       | NIST Webbook |
| rinpol | 354.80        |       | NIST Webbook |
| rinpol | 354.00        |       | NIST Webbook |
| rinpol | 354.00        |       | NIST Webbook |
| rinpol | 364.00        |       | NIST Webbook |
| rinpol | 368.00        |       | NIST Webbook |
| rinpol | 353.53        |       | NIST Webbook |
| rinpol | 353.53        |       | NIST Webbook |
| rinpol | 353.99        |       | NIST Webbook |
| rinpol | 354.20        |       | NIST Webbook |
| rinpol | 362.00        |       | NIST Webbook |
| rinpol | 366.00        |       | NIST Webbook |
| rinpol | 363.00        |       | NIST Webbook |
| rinpol | 366.00        |       | NIST Webbook |
| rinpol | 362.00        |       | NIST Webbook |
| rinpol | 366.00        |       | NIST Webbook |
| rinpol | 354.00        |       | NIST Webbook |
| rinpol | 354.00        |       | NIST Webbook |
| rinpol | 365.00        |       | NIST Webbook |
| rinpol | 354.00        |       | NIST Webbook |
| rinpol | 366.00        |       | NIST Webbook |
| rinpol | 354.00        |       | NIST Webbook |
| rinpol | 370.00        |       | NIST Webbook |
| rinpol | 370.00        |       | NIST Webbook |
| rinpol | 350.00        |       | NIST Webbook |
| rinpol | 368.00        |       | NIST Webbook |
| rinpol | 369.00        |       | NIST Webbook |
| rinpol | 366.00        |       | NIST Webbook |
| rinpol | 354.20        |       | NIST Webbook |
| rinpol | 366.00        |       | NIST Webbook |
| rinpol | 366.00        |       | NIST Webbook |
| rinpol | 361.10        |       | NIST Webbook |
| rinpol | 366.00        |       | NIST Webbook |
| rinpol | 366.70        |       | NIST Webbook |
| rinpol | 359.00        |       | NIST Webbook |
| rinpol | 365.00        |       | NIST Webbook |

|        |               |         |                                                                                                                                |
|--------|---------------|---------|--------------------------------------------------------------------------------------------------------------------------------|
| rinpol | 365.00        |         | NIST Webbook                                                                                                                   |
| rinpol | 364.60        |         | NIST Webbook                                                                                                                   |
| rinpol | 366.00        |         | NIST Webbook                                                                                                                   |
| rinpol | 371.00        |         | NIST Webbook                                                                                                                   |
| rinpol | 366.00        |         | NIST Webbook                                                                                                                   |
| rinpol | 367.40        |         | NIST Webbook                                                                                                                   |
| rinpol | 366.00        |         | NIST Webbook                                                                                                                   |
| ripol  | 369.00        |         | NIST Webbook                                                                                                                   |
| ripol  | 372.00        |         | NIST Webbook                                                                                                                   |
| sl     | 198.70        | J/mol×K | NIST Webbook                                                                                                                   |
| sl     | 200.79        | J/mol×K | NIST Webbook                                                                                                                   |
| tb     | 261.50 ± 0.30 | K       | NIST Webbook                                                                                                                   |
| tb     | 261.30        | K       | NIST Webbook                                                                                                                   |
| tb     | 261.50        | K       | NIST Webbook                                                                                                                   |
| tb     | 261.42        | K       | KDB                                                                                                                            |
| tb     | 261.51        | K       | NIST Webbook                                                                                                                   |
| tb     | 261.42 ± 0.30 | K       | NIST Webbook                                                                                                                   |
| tb     | 262.75 ± 1.00 | K       | NIST Webbook                                                                                                                   |
| tb     | 261.40 ± 0.50 | K       | NIST Webbook                                                                                                                   |
| tb     | 262.95 ± 0.30 | K       | NIST Webbook                                                                                                                   |
| tb     | 256.15 ± 1.00 | K       | NIST Webbook                                                                                                                   |
| tb     | 262.95 ± 0.50 | K       | NIST Webbook                                                                                                                   |
| tb     | 262.95 ± 0.50 | K       | NIST Webbook                                                                                                                   |
| tb     | 260.85 ± 1.00 | K       | NIST Webbook                                                                                                                   |
| tb     | 260.15 ± 1.00 | K       | NIST Webbook                                                                                                                   |
| tb     | 261.65 ± 0.50 | K       | NIST Webbook                                                                                                                   |
| tb     | 260.85 ± 1.00 | K       | NIST Webbook                                                                                                                   |
| tb     | 262.25 ± 1.00 | K       | NIST Webbook                                                                                                                   |
| tb     | 260.75 ± 1.00 | K       | NIST Webbook                                                                                                                   |
| tb     | 262.95 ± 1.00 | K       | NIST Webbook                                                                                                                   |
| tb     | 260.33 ± 0.15 | K       | NIST Webbook                                                                                                                   |
| tb     | 261.50 ± 0.30 | K       | NIST Webbook                                                                                                                   |
| tb     | 261.65 ± 0.30 | K       | NIST Webbook                                                                                                                   |
| tb     | 261.15 ± 2.00 | K       | NIST Webbook                                                                                                                   |
| tb     | 261.05 ± 0.50 | K       | NIST Webbook                                                                                                                   |
| tb     | 261.40 ± 1.00 | K       | NIST Webbook                                                                                                                   |
| tb     | 261.40 ± 0.50 | K       | NIST Webbook                                                                                                                   |
| tc     | 407.80        | K       | KDB                                                                                                                            |
| tc     | 407.69        | K       | Critical Parameters and<br>Critical-Region ( p, .rho.,<br>T) Data of<br>trans-1,1,1,3-Tetrafluorobut-2-ene<br>[HFO-1354mzy(E)] |
| tf     | 124.20        | K       | Aqueous Solubility<br>Prediction Method                                                                                        |
| tf     | 134.80        | K       | KDB                                                                                                                            |

|     |               |         |              |
|-----|---------------|---------|--------------|
| tt  | 113.55        | K       | KDB          |
| tt  | 113.55 ± 0.05 | K       | NIST Webbook |
| tt  | 113.55 ± 0.02 | K       | NIST Webbook |
| tt  | 113.74 ± 0.07 | K       | NIST Webbook |
| tt  | 113.20 ± 0.20 | K       | NIST Webbook |
| vc  | 0.259         | m3/kmol | NIST Webbook |
| vc  | 0.259 ± 0.001 | m3/kmol | NIST Webbook |
| vc  | 0.259         | m3/kmol | KDB          |
| zc  | 0.2752960     |         | KDB          |
| zra | 0.28          |         | KDB          |

## Temperature Dependent Properties

| Property code | Value         | Unit    | Temperature [K] | Source        |
|---------------|---------------|---------|-----------------|---------------|
| cpg           | 89.97 ± 0.06  | J/mol×K | 273.15          | NIST Webbook  |
| cpg           | 112.55        | J/mol×K | 359.40          | NIST Webbook  |
| cpg           | 119.62        | J/mol×K | 387.50          | NIST Webbook  |
| cpg           | 106.37 ± 0.11 | J/mol×K | 333.15          | NIST Webbook  |
| cpg           | 152.93        | J/mol×K | 520.90          | NIST Webbook  |
| cpg           | 161.29        | J/mol×K | 561.70          | NIST Webbook  |
| cpg           | 169.70        | J/mol×K | 605.30          | NIST Webbook  |
| cpg           | 185.18        | J/mol×K | 692.70          | NIST Webbook  |
| cpg           | 100.67 ± 0.10 | J/mol×K | 313.15          | NIST Webbook  |
| cpg           | 95.21 ± 0.10  | J/mol×K | 293.15          | NIST Webbook  |
| cpg           | 82.30 ± 0.06  | J/mol×K | 243.15          | NIST Webbook  |
| cpg           | 137.03        | J/mol×K | 452.50          | NIST Webbook  |
| cpg           | 109.66        | J/mol×K | 347.60          | NIST Webbook  |
| cpg           | 111.74 ± 0.11 | J/mol×K | 353.15          | NIST Webbook  |
| cpl           | 129.70        | J/mol×K | 260.00          | NIST Webbook  |
| cpl           | 128.40        | J/mol×K | 258.30          | NIST Webbook  |
| dvisc         | 0.0001816     | Pa×s    | 290.48          | Joback Method |
| dvisc         | 0.0063422     | Pa×s    | 119.84          | Joback Method |
| dvisc         | 0.0019879     | Pa×s    | 148.28          | Joback Method |
| dvisc         | 0.0009051     | Pa×s    | 176.72          | Joback Method |
| dvisc         | 0.0005126     | Pa×s    | 205.16          | Joback Method |
| dvisc         | 0.0003334     | Pa×s    | 233.60          | Joback Method |
| dvisc         | 0.0002380     | Pa×s    | 262.04          | Joback Method |
| hfust         | 4.54          | kJ/mol  | 113.70          | NIST Webbook  |
| hfust         | 4.56          | kJ/mol  | 113.70          | NIST Webbook  |
| hfust         | 4.49          | kJ/mol  | 113.70          | NIST Webbook  |
| hfust         | 4.54          | kJ/mol  | 113.74          | NIST Webbook  |

|       |              |        |        |                                                                           |
|-------|--------------|--------|--------|---------------------------------------------------------------------------|
| hfust | 4.50         | kJ/mol | 113.20 | NIST Webbook                                                              |
| hvapt | 22.40        | kJ/mol | 233.00 | NIST Webbook                                                              |
| hvapt | 21.60        | kJ/mol | 384.50 | NIST Webbook                                                              |
| hvapt | 21.30        | kJ/mol | 261.44 | NIST Webbook                                                              |
| hvapt | 22.60        | kJ/mol | 225.00 | NIST Webbook                                                              |
| hvapt | 21.30        | kJ/mol | 261.30 | NIST Webbook                                                              |
| hvapt | 21.30        | kJ/mol | 286.00 | NIST Webbook                                                              |
| hvapt | 21.60        | kJ/mol | 310.50 | NIST Webbook                                                              |
| hvapt | 21.40        | kJ/mol | 333.50 | NIST Webbook                                                              |
| hvapt | 21.50        | kJ/mol | 318.00 | NIST Webbook                                                              |
| hvapt | 26.90        | kJ/mol | 154.00 | NIST Webbook                                                              |
| hvapt | 21.30        | kJ/mol | 261.50 | KDB                                                                       |
| hvapt | 21.00 ± 3.00 | kJ/mol | 261.44 | NIST Webbook                                                              |
| hvapt | 21.90        | kJ/mol | 284.50 | NIST Webbook                                                              |
| kvisc | 0.0000003    | m2/s   | 303.37 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000003    | m2/s   | 285.13 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000003    | m2/s   | 290.11 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000003    | m2/s   | 295.11 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000003    | m2/s   | 300.41 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000003    | m2/s   | 309.08 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000002    | m2/s   | 313.12 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000002    | m2/s   | 315.07 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |

|       |           |      |        |                                                                           |
|-------|-----------|------|--------|---------------------------------------------------------------------------|
| kvisc | 0.0000002 | m2/s | 318.20 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000002 | m2/s | 320.12 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000002 | m2/s | 323.83 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000002 | m2/s | 326.11 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000002 | m2/s | 330.11 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000002 | m2/s | 333.14 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000002 | m2/s | 335.12 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000002 | m2/s | 340.12 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000002 | m2/s | 340.15 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |
| kvisc | 0.0000002 | m2/s | 345.15 | Saturated Liquid Viscosity of Ethyl Fluoride (HFC161) from 233 K to 373 K |

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|------|--------|-----|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 63.35  | kPa | 250.00 | Measurement of the (p, $\rho$ , T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 301.80 | kPa | 293.15 | Vapor-Liquid Equilibria for the Binary System Pentafluoroethane (HFC-125) + Isobutane (HC-600a) at Temperatures from (243.15 to 333.15) K                                                                |
| pvap | 220.10 | kPa | 283.15 | Vapor-Liquid Equilibria for the Binary System Pentafluoroethane (HFC-125) + Isobutane (HC-600a) at Temperatures from (243.15 to 333.15) K                                                                |
| pvap | 150.90 | kPa | 272.15 | Vapor-Liquid Equilibria for the Binary System Pentafluoroethane (HFC-125) + Isobutane (HC-600a) at Temperatures from (243.15 to 333.15) K                                                                |
| pvap | 107.90 | kPa | 263.15 | Vapor-Liquid Equilibria for the Binary System Pentafluoroethane (HFC-125) + Isobutane (HC-600a) at Temperatures from (243.15 to 333.15) K                                                                |

|      |        |     |        |                                                                                                                                                             |
|------|--------|-----|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 72.00  | kPa | 253.15 | Vapor-Liquid Equilibria for the Binary System Pentafluoroethane (HFC-125) + Isobutane (HC-600a) at Temperatures from (243.15 to 333.15) K                   |
| pvap | 46.20  | kPa | 243.15 | Vapor-Liquid Equilibria for the Binary System Pentafluoroethane (HFC-125) + Isobutane (HC-600a) at Temperatures from (243.15 to 333.15) K                   |
| pvap | 404.30 | kPa | 303.15 | Vapor-Liquid Equilibria for the Binary System Pentafluoroethane (HFC-125) + Isobutane (HC-600a) at Temperatures from (243.15 to 333.15) K                   |
| pvap | 186.70 | kPa | 278.15 | Vapor Liquid Equilibria of the trans-1,3,3,3-Tetrafluoropropene (R1234ze(E)) + Isobutane (R600a) System at Various Temperatures from (258.150 to 288.150) K |
| pvap | 130.80 | kPa | 268.15 | Vapor Liquid Equilibria of the trans-1,3,3,3-Tetrafluoropropene (R1234ze(E)) + Isobutane (R600a) System at Various Temperatures from (258.150 to 288.150) K |
| pvap | 88.90  | kPa | 258.15 | Vapor Liquid Equilibria of the trans-1,3,3,3-Tetrafluoropropene (R1234ze(E)) + Isobutane (R600a) System at Various Temperatures from (258.150 to 288.150) K |

|      |         |     |        |                                                                                                                                                                                                                                                                                                   |
|------|---------|-----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 1269.50 | kPa | 350.54 | Vapor-Liquid Equilibrium for Dimethyl Disulfide + Butane, + trans-But-2-ene, + 2-Methylpropane, + 2-Methylpropene, + Ethanol, and 2-Ethoxy-2-methylpropane                                                                                                                                        |
| pvap | 926.60  | kPa | 335.83 | Vapor-Liquid Equilibrium for Thiophene + Butane, + trans-But-2-ene, + 2-Methylpropane, and + 2-Methylpropene                                                                                                                                                                                      |
| pvap | 467.40  | kPa | 308.14 | Vapor-Liquid Equilibrium for Thiophene + Butane, + trans-But-2-ene, + 2-Methylpropane, and + 2-Methylpropene                                                                                                                                                                                      |
| pvap | 1685.60 | kPa | 364.50 | Vapor Liquid Equilibrium for Six Binary Systems of C4-Hydrocarbons + 2-Propanone                                                                                                                                                                                                                  |
| pvap | 1212.70 | kPa | 348.15 | Vapor-Liquid Equilibria on Seven Binary Systems: Ethylene Oxide + 2-Methylpropane; Acetophenone + Phenol; cis-1,3-Dichloropropene + 1,2-Dichloropropane; 1,5-Hexadiene + Allyl Chloride; Isopropyl Acetate + Acetonitrile; Vinyl Chloride + Methyl Chloride; and 1,4-Butanediol + c-Butyrolactone |

|      |         |     |        |                                                                                                                                                                                                                                                                                                                              |
|------|---------|-----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 352.39  | kPa | 298.15 | Vapor-Liquid Equilibria on Seven Binary Systems:<br>Ethylene Oxide + 2-Methylpropane;<br>Acetophenone + Phenol;<br>cis-1,3-Dichloropropene +<br>1,2-Dichloropropane;<br>1,5-Hexadiene + Allyl Chloride;<br>Isopropyl Acetate + Acetonitrile;<br>Vinyl Chloride + Methyl Chloride;<br>and<br>1,4-Butanediol + c-Butyrolactone |
| pvap | 610.84  | kPa | 318.59 | Vapor-Liquid Equilibrium for 1-Propanol + 1-Butene, + cis-2-Butene, + 2-Methyl-propene, + trans-2-Butene, + n-Butane, and + 2-Methyl-propane                                                                                                                                                                                 |
| pvap | 2250.40 | kPa | 380.00 | Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)                                                                                                                                                                                                                                       |
| pvap | 1541.60 | kPa | 360.00 | Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)                                                                                                                                                                                                                                       |
| pvap | 1013.70 | kPa | 340.00 | Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)                                                                                                                                                                                                                                       |
| pvap | 632.50  | kPa | 320.00 | Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)                                                                                                                                                                                                                                       |
| pvap | 368.60  | kPa | 300.00 | Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)                                                                                                                                                                                                                                       |

|      |        |     |        |                                                                                                                                                                    |
|------|--------|-----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 197.80 | kPa | 280.00 | Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)                                                                             |
| pvap | 94.60  | kPa | 260.00 | Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)                                                                             |
| pvap | 40.10  | kPa | 240.00 | Liquid-Phase Thermodynamic Properties for Propane (1), n-Butane (2), and Isobutane (3)                                                                             |
| pvap | 405.20 | kPa | 303.15 | Measurement of Vapor-Liquid Equilibria for the Binary Mixture of Propane (R-290) + Isobutane (R-600a)                                                              |
| pvap | 303.40 | kPa | 293.15 | Measurement of Vapor-Liquid Equilibria for the Binary Mixture of Propane (R-290) + Isobutane (R-600a)                                                              |
| pvap | 221.80 | kPa | 283.15 | Measurement of Vapor-Liquid Equilibria for the Binary Mixture of Propane (R-290) + Isobutane (R-600a)                                                              |
| pvap | 157.20 | kPa | 273.15 | Measurement of Vapor-Liquid Equilibria for the Binary Mixture of Propane (R-290) + Isobutane (R-600a)                                                              |
| pvap | 221.00 | kPa | 283.15 | Vapor Liquid Phase Equilibrium for Azeotropic Isobutane + trans-1,3,3,3-Tetrafluoropropene + Trifluoroiodomethane System at Temperatures from 243.150 to 283.150 K |

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|------|--------|-----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 157.40 | kPa | 273.15 | Vapor Liquid Phase<br>Equilibrium for<br>Azeotropic<br>Isobutane +<br>trans-1,3,3,3-Tetrafluoropropene<br>+<br>Trifluoroiodomethane<br>System at<br>Temperatures<br>from 243.150 to<br>283.150 K                                           |
| pvap | 108.70 | kPa | 263.15 | Vapor Liquid Phase<br>Equilibrium for<br>Azeotropic<br>Isobutane +<br>trans-1,3,3,3-Tetrafluoropropene<br>+<br>Trifluoroiodomethane<br>System at<br>Temperatures<br>from 243.150 to<br>283.150 K                                           |
| pvap | 72.60  | kPa | 253.15 | Vapor Liquid Phase<br>Equilibrium for<br>Azeotropic<br>Isobutane +<br>trans-1,3,3,3-Tetrafluoropropene<br>+<br>Trifluoroiodomethane<br>System at<br>Temperatures<br>from 243.150 to<br>283.150 K                                           |
| pvap | 46.70  | kPa | 243.15 | Vapor Liquid Phase<br>Equilibrium for<br>Azeotropic<br>Isobutane +<br>trans-1,3,3,3-Tetrafluoropropene<br>+<br>Trifluoroiodomethane<br>System at<br>Temperatures<br>from 243.150 to<br>283.150 K                                           |
| pvap | 404.50 | kPa | 303.15 | Measurements<br>and correlations<br>of isothermal<br>(vapour + liquid)<br>equilibrium for<br>the {isobutane<br>(R600a) +<br>cis-1,3,3,3-tetrafluoropropene<br>(R1234ze(Z))}<br>system at<br>temperatures<br>from (303.150 to<br>353.150) K |

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|------|---------|-----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| pvap | 530.90  | kPa | 313.15 | Measurements and correlations of isothermal (vapour + liquid) equilibrium for the {isobutane (R600a) + cis-1,3,3,3-tetrafluoropropene (R1234ze(Z))} system at temperatures from (303.150 to 353.150) K |  |
| pvap | 684.60  | kPa | 323.15 | Measurements and correlations of isothermal (vapour + liquid) equilibrium for the {isobutane (R600a) + cis-1,3,3,3-tetrafluoropropene (R1234ze(Z))} system at temperatures from (303.150 to 353.150) K |  |
| pvap | 869.00  | kPa | 333.15 | Measurements and correlations of isothermal (vapour + liquid) equilibrium for the {isobutane (R600a) + cis-1,3,3,3-tetrafluoropropene (R1234ze(Z))} system at temperatures from (303.150 to 353.150) K |  |
| pvap | 1087.40 | kPa | 343.15 | Measurements and correlations of isothermal (vapour + liquid) equilibrium for the {isobutane (R600a) + cis-1,3,3,3-tetrafluoropropene (R1234ze(Z))} system at temperatures from (303.150 to 353.150) K |  |
| pvap | 1343.40 | kPa | 353.15 | Measurements and correlations of isothermal (vapour + liquid) equilibrium for the {isobutane (R600a) + cis-1,3,3,3-tetrafluoropropene (R1234ze(Z))} system at temperatures from (303.150 to 353.150) K |  |

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|------|---------|-----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 1105.10 | kPa | 343.88 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 685.60  | kPa | 323.15 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 531.60  | kPa | 313.15 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 404.70  | kPa | 303.15 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 302.20  | kPa | 293.15 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 1365.10 | kPa | 353.91 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |

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|------|---------|-----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 1309.80 | kPa | 351.91 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 1256.30 | kPa | 349.90 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 1204.40 | kPa | 347.86 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 1153.10 | kPa | 345.86 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 1102.50 | kPa | 343.78 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 1054.50 | kPa | 341.75 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |

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|------|---------|-----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 1011.50 | kPa | 339.85 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 966.20  | kPa | 337.79 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 922.50  | kPa | 335.74 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 880.50  | kPa | 333.71 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 840.80  | kPa | 331.72 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 802.70  | kPa | 329.74 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |

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| pvap | 765.30 | kPa | 327.73 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 730.90 | kPa | 325.77 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 530.80 | kPa | 313.15 | Vapor-Liquid Equilibria for the Binary System Pentafluoroethane (HFC-125) + Isobutane (HC-600a) at Temperatures from (243.15 to 333.15) K         |
| pvap | 661.70 | kPa | 321.75 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 629.00 | kPa | 319.72 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 598.10 | kPa | 317.73 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |

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|------|--------|-----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 567.90 | kPa | 315.70 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 538.70 | kPa | 313.69 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 510.90 | kPa | 311.66 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 484.20 | kPa | 309.65 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 458.60 | kPa | 307.64 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 433.90 | kPa | 305.63 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |

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|------|--------|-----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 410.20 | kPa | 303.62 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 387.60 | kPa | 301.61 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 365.90 | kPa | 299.59 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 345.20 | kPa | 297.58 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 325.60 | kPa | 295.58 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 306.70 | kPa | 293.58 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |

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|------|--------|-----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 306.70 | kPa | 293.58 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows         |
| pvap | 302.30 | kPa | 293.15 | Measurements of (vapour + liquid) equilibrium data for {trifluoroiodomethane (R13I1) + isobutane (R600a)} at temperatures between (263.150 and 293.150) K |
| pvap | 220.60 | kPa | 283.15 | Measurements of (vapour + liquid) equilibrium data for {trifluoroiodomethane (R13I1) + isobutane (R600a)} at temperatures between (263.150 and 293.150) K |
| pvap | 156.90 | kPa | 273.15 | Measurements of (vapour + liquid) equilibrium data for {trifluoroiodomethane (R13I1) + isobutane (R600a)} at temperatures between (263.150 and 293.150) K |
| pvap | 108.30 | kPa | 263.15 | Measurements of (vapour + liquid) equilibrium data for {trifluoroiodomethane (R13I1) + isobutane (R600a)} at temperatures between (263.150 and 293.150) K |

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|------|---------|-----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 369.80  | kPa | 300.00 | Measurements of (p,q,T) properties for isobutane in the temperature range from 280 K to 440 K at pressures up to 200 MPa                                                                             |
| pvap | 199.80  | kPa | 280.00 | Measurements of (p,q,T) properties for isobutane in the temperature range from 280 K to 440 K at pressures up to 200 MPa                                                                             |
| pvap | 1014.84 | kPa | 340.00 | Measurement of the (p,.rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 807.64  | kPa | 330.00 | Measurement of the (p,.rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 633.38  | kPa | 320.00 | Measurement of the (p,.rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |

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|------|--------|-----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 488.62 | kPa | 310.00 | Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 370.01 | kPa | 300.00 | Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 274.41 | kPa | 290.00 | Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 198.76 | kPa | 280.00 | Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |

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| pvap | 142.73  | kPa | 270.50 | Measurement of the (p,ρ,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 95.88   | kPa | 260.00 | Measurement of the (p,ρ,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 684.30  | kPa | 323.15 | Vapor-Liquid Equilibria for the Binary System Pentafluoroethane (HFC-125) + Isobutane (HC-600a) at Temperatures from (243.15 to 333.15) K                                                        |
| pvap | 868.30  | kPa | 333.15 | Vapor-Liquid Equilibria for the Binary System Pentafluoroethane (HFC-125) + Isobutane (HC-600a) at Temperatures from (243.15 to 333.15) K                                                        |
| pvap | 1685.60 | kPa | 364.50 | Vapor Liquid Equilibrium for the Systems 2-Methylpropane + Methanol, + 2-Propanol, + 2-Butanol, and + 2-Methyl-2-propanol at 364.5 K                                                             |

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|------|---------|-----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 1686.40 | kPa | 364.51 | Vapor Liquid Equilibrium for the Systems 2-Methylpropane + Methanol, + 2-Propanol, + 2-Butanol, and + 2-Methyl-2-propanol at 364.5 K                                                       |
| pvap | 1686.30 | kPa | 364.51 | Vapor Liquid Equilibrium for the Systems 2-Methylpropane + Methanol, + 2-Propanol, + 2-Butanol, and + 2-Methyl-2-propanol at 364.5 K                                                       |
| pvap | 1686.30 | kPa | 364.52 | Vapor Liquid Equilibrium for the Systems 2-Methylpropane + Methanol, + 2-Propanol, + 2-Butanol, and + 2-Methyl-2-propanol at 364.5 K                                                       |
| pvap | 607.80  | kPa | 318.33 | Vapor-Liquid Equilibrium for 1-Butanol + 1-Butene at (318.4 and 364.5) K and Vapor-Liquid Equilibrium of 1-Butanol + 2-Methylpropane, + n-Butane and 1-Butene + 2-Methylpropane at 318.4 K |
| pvap | 608.10  | kPa | 318.34 | Vapor-Liquid Equilibrium for 1-Butanol + 1-Butene at (318.4 and 364.5) K and Vapor-Liquid Equilibrium of 1-Butanol + 2-Methylpropane, + n-Butane and 1-Butene + 2-Methylpropane at 318.4 K |

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| pvap | 696.10  | kPa | 323.82 | A static analytical apparatus for vapour pressures and (vapour + liquid) phase equilibrium measurements with an internal stirrer and view windows |
| pvap | 608.30  | kPa | 318.34 | Vapor-Liquid Equilibrium for Tetrahydrothiophene + n-Butane, + trans-2-Butene, + 2-Methylpropane, and + 2-Methylpropene                           |
| pvap | 1177.50 | kPa | 346.96 | Vapor-Liquid Equilibrium for Tetrahydrothiophene + n-Butane, + trans-2-Butene, + 2-Methylpropane, and + 2-Methylpropene                           |
| pvap | 1179.90 | kPa | 346.91 | Isothermal Binary Vapor-Liquid Equilibrium for 2-Methylpropane and n-Butane with 1,2-Ethanedithiol and 2-Methyl-2-propanethiol                    |
| pvap | 1178.60 | kPa | 346.97 | Isothermal Binary Vapor-Liquid Equilibrium for 2-Methylpropane and n-Butane with 1,2-Ethanedithiol and 2-Methyl-2-propanethiol                    |
| pvap | 607.54  | kPa | 318.39 | Vapour liquid equilibrium for the ethyl ethanoate + 1-butene, +cis-2-butene, +trans-2-butene, +2-methylpropene, +n-butane and +2-methylpropane    |

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| pvap | 529.65 | kPa | 313.06 | Vapour liquid equilibrium for the 2-methylpropane + methanol, +ethanol, +2-propanol, +2-butanol and +2-methyl-2-propanol systems at 313.15K |
| pvap | 530.05 | kPa | 313.08 | Vapour liquid equilibrium for the 2-methylpropane + methanol, +ethanol, +2-propanol, +2-butanol and +2-methyl-2-propanol systems at 313.15K |
| pvap | 529.95 | kPa | 313.08 | Vapour liquid equilibrium for the 2-methylpropane + methanol, +ethanol, +2-propanol, +2-butanol and +2-methyl-2-propanol systems at 313.15K |
| pvap | 529.95 | kPa | 313.10 | Vapour liquid equilibrium for the 2-methylpropane + methanol, +ethanol, +2-propanol, +2-butanol and +2-methyl-2-propanol systems at 313.15K |
| pvap | 530.75 | kPa | 313.12 | Vapour liquid equilibrium for the 2-methylpropane + methanol, +ethanol, +2-propanol, +2-butanol and +2-methyl-2-propanol systems at 313.15K |
| pvap | 459.80 | kPa | 307.86 | Isothermal binary vapour liquid equilibrium for butanes and butenes with dimethylsulphide                                                   |

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|------|---------|-----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 1321.00 | kPa | 353.15 | Solubility, density and viscosity of mixtures of isobutane (R-600a) and a linear alkylbenzene lubricant oil                                          |
| pvap | 868.00  | kPa | 332.65 | Solubility, density and viscosity of mixtures of isobutane (R-600a) and a linear alkylbenzene lubricant oil                                          |
| pvap | 529.00  | kPa | 313.15 | Solubility, density and viscosity of mixtures of isobutane (R-600a) and a linear alkylbenzene lubricant oil                                          |
| pvap | 330.00  | kPa | 296.15 | Solubility, density and viscosity of mixtures of isobutane (R-600a) and a linear alkylbenzene lubricant oil                                          |
| pvap | 459.90  | kPa | 307.94 | Vapour liquid equilibrium for the systems diethyl sulphide + 1-butene, +cis-2-butene, +2-methylpropane, +2-methylpropene, +n-butane, +trans-2-butene |
| pvap | 460.80  | kPa | 307.79 | Phase equilibrium measurements for systems containing propanenitrile with tert-butyl ethyl ether and C4-hydrocarbons                                 |
| pvap | 222.20  | kPa | 283.15 | Vapor-liquid equilibria for binary system of 2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) + isobutane (HC-600a)                                        |

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|------|---------|-----|--------|-----------------------------------------------------------------------------------------------------------------------|--|
| pvap | 303.30  | kPa | 293.15 | Vapor-liquid equilibria for binary system of 2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) + isobutane (HC-600a)         |  |
| pvap | 406.00  | kPa | 303.15 | Vapor-liquid equilibria for binary system of 2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) + isobutane (HC-600a)         |  |
| pvap | 530.30  | kPa | 313.15 | Vapor-liquid equilibria for binary system of 2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) + isobutane (HC-600a)         |  |
| pvap | 684.40  | kPa | 323.15 | Vapor-liquid equilibria for binary system of 2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) + isobutane (HC-600a)         |  |
| pvap | 536.00  | kPa | 313.20 | High pressure vapor-liquid equilibria measurements and modeling of butane/ethanol system and isobutane/ethanol system |  |
| pvap | 880.00  | kPa | 333.20 | High pressure vapor-liquid equilibria measurements and modeling of butane/ethanol system and isobutane/ethanol system |  |
| pvap | 1363.00 | kPa | 353.20 | High pressure vapor-liquid equilibria measurements and modeling of butane/ethanol system and isobutane/ethanol system |  |

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|------|---------|-----|--------|-----------------------------------------------------------------------------------------------------------------------|--|
| pvap | 2014.00 | kPa | 373.20 | High pressure vapor-liquid equilibria measurements and modeling of butane/ethanol system and isobutane/ethanol system |  |
| pvap | 3377.00 | kPa | 403.20 | High pressure vapor-liquid equilibria measurements and modeling of butane/ethanol system and isobutane/ethanol system |  |
| pvap | 91.82   | kPa | 258.92 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a)                                          |  |
| pvap | 112.99  | kPa | 264.24 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a)                                          |  |
| pvap | 119.32  | kPa | 265.67 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a)                                          |  |
| pvap | 126.35  | kPa | 267.20 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a)                                          |  |
| pvap | 156.00  | kPa | 273.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a)                                          |  |
| pvap | 156.85  | kPa | 273.15 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a)                                          |  |
| pvap | 169.22  | kPa | 275.31 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a)                                          |  |

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| pvap | 191.71 | kPa | 278.94 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 198.68 | kPa | 280.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 207.12 | kPa | 281.24 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 218.08 | kPa | 282.81 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 226.90 | kPa | 284.02 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 240.51 | kPa | 285.82 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 251.70 | kPa | 287.25 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 263.24 | kPa | 288.67 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 274.38 | kPa | 290.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 291.50 | kPa | 291.96 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |

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| pvap | 291.68 | kPa | 291.99 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 305.47 | kPa | 293.50 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 317.56 | kPa | 294.79 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 332.18 | kPa | 296.30 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 369.83 | kPa | 299.97 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 381.52 | kPa | 301.05 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 400.60 | kPa | 302.76 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 420.14 | kPa | 304.46 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 438.06 | kPa | 305.97 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 438.12 | kPa | 305.97 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |

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|------|--------|-----|--------|------------------------------------------------------------------------------|--|
| pvap | 455.55 | kPa | 307.39 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 473.64 | kPa | 308.82 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 488.84 | kPa | 310.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 488.84 | kPa | 310.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 516.99 | kPa | 312.11 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 550.49 | kPa | 314.51 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 550.72 | kPa | 314.52 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 581.22 | kPa | 316.61 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 633.44 | kPa | 320.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 665.79 | kPa | 322.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |

|      |        |     |        |                                                                              |  |
|------|--------|-----|--------|------------------------------------------------------------------------------|--|
| pvap | 701.60 | kPa | 324.13 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 734.19 | kPa | 326.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 734.22 | kPa | 326.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 744.59 | kPa | 326.58 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 770.36 | kPa | 328.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 781.99 | kPa | 328.63 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 807.67 | kPa | 330.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 846.32 | kPa | 332.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 849.38 | kPa | 332.15 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 886.42 | kPa | 334.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |

|      |         |     |        |                                                                              |  |
|------|---------|-----|--------|------------------------------------------------------------------------------|--|
| pvap | 900.88  | kPa | 334.71 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 989.76  | kPa | 338.87 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 1060.54 | kPa | 342.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 1073.84 | kPa | 342.57 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 1107.76 | kPa | 344.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 1128.12 | kPa | 344.84 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 1193.58 | kPa | 347.48 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 1258.83 | kPa | 350.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 1392.47 | kPa | 354.89 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 1457.16 | kPa | 357.13 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |

|      |         |     |        |                                                                              |  |
|------|---------|-----|--------|------------------------------------------------------------------------------|--|
| pvap | 1543.11 | kPa | 360.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 1618.29 | kPa | 362.41 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 1690.65 | kPa | 364.65 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 1773.08 | kPa | 367.12 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 1872.59 | kPa | 370.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 1990.51 | kPa | 373.25 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 2087.20 | kPa | 375.82 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 2170.21 | kPa | 377.95 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 2252.24 | kPa | 380.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 2363.44 | kPa | 382.69 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |

|      |         |     |        |                                                                              |  |
|------|---------|-----|--------|------------------------------------------------------------------------------|--|
| pvap | 2468.26 | kPa | 385.14 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 2593.62 | kPa | 387.96 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 2687.23 | kPa | 390.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 2688.25 | kPa | 390.02 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 2812.85 | kPa | 392.64 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 2815.45 | kPa | 392.70 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 2897.05 | kPa | 394.37 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 2917.12 | kPa | 394.77 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 3054.96 | kPa | 397.49 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 3166.88 | kPa | 399.62 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |

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|------|---------|-----|--------|------------------------------------------------------------------------------|--|
| pvap | 3187.16 | kPa | 400.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 3191.89 | kPa | 400.09 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 3197.39 | kPa | 400.19 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 3320.93 | kPa | 402.45 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 3321.83 | kPa | 402.46 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 3404.51 | kPa | 403.93 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 3449.23 | kPa | 404.71 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 3465.73 | kPa | 405.00 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |
| pvap | 3523.63 | kPa | 405.99 | Vapor pressure and gaseous speed of sound measurements for isobutane (R600a) |  |

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|------|--------|-----|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 220.90 | kPa | 283.15 | Vapor-liquid equilibria measurements of 1,1,1,2-tetrafluoroethane (HFC-134a) + 2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) + isobutane (HC-600a) ternary system |
| pvap | 302.70 | kPa | 293.15 | Vapor-liquid equilibria measurements of 1,1,1,2-tetrafluoroethane (HFC-134a) + 2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) + isobutane (HC-600a) ternary system |
| pvap | 404.40 | kPa | 303.15 | Vapor-liquid equilibria measurements of 1,1,1,2-tetrafluoroethane (HFC-134a) + 2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) + isobutane (HC-600a) ternary system |
| pvap | 531.30 | kPa | 313.15 | Vapor-liquid equilibria measurements of 1,1,1,2-tetrafluoroethane (HFC-134a) + 2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) + isobutane (HC-600a) ternary system |
| pvap | 684.20 | kPa | 323.15 | Vapor-liquid equilibria measurements of 1,1,1,2-tetrafluoroethane (HFC-134a) + 2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) + isobutane (HC-600a) ternary system |
| pvap | 488.40 | kPa | 310.00 | Vapour pressures of isobutane at T = (310 to 407) K                                                                                                            |
| pvap | 488.60 | kPa | 310.00 | Vapour pressures of isobutane at T = (310 to 407) K                                                                                                            |
| pvap | 488.20 | kPa | 310.00 | Vapour pressures of isobutane at T = (310 to 407) K                                                                                                            |

|      |         |     |        |                                                     |
|------|---------|-----|--------|-----------------------------------------------------|
| pvap | 500.90  | kPa | 310.92 | Vapour pressures of isobutane at T = (310 to 407) K |
| pvap | 530.90  | kPa | 313.14 | Vapour pressures of isobutane at T = (310 to 407) K |
| pvap | 633.20  | kPa | 320.00 | Vapour pressures of isobutane at T = (310 to 407) K |
| pvap | 716.50  | kPa | 325.00 | Vapour pressures of isobutane at T = (310 to 407) K |
| pvap | 807.50  | kPa | 330.00 | Vapour pressures of isobutane at T = (310 to 407) K |
| pvap | 906.60  | kPa | 335.00 | Vapour pressures of isobutane at T = (310 to 407) K |
| pvap | 1014.60 | kPa | 340.00 | Vapour pressures of isobutane at T = (310 to 407) K |
| pvap | 1114.00 | kPa | 344.24 | Vapour pressures of isobutane at T = (310 to 407) K |
| pvap | 1258.50 | kPa | 350.00 | Vapour pressures of isobutane at T = (310 to 407) K |
| pvap | 1395.40 | kPa | 355.00 | Vapour pressures of isobutane at T = (310 to 407) K |
| pvap | 1542.80 | kPa | 360.00 | Vapour pressures of isobutane at T = (310 to 407) K |
| pvap | 1641.60 | kPa | 363.13 | Vapour pressures of isobutane at T = (310 to 407) K |
| pvap | 1846.50 | kPa | 369.24 | Vapour pressures of isobutane at T = (310 to 407) K |
| pvap | 1872.50 | kPa | 370.00 | Vapour pressures of isobutane at T = (310 to 407) K |
| pvap | 2056.00 | kPa | 375.00 | Vapour pressures of isobutane at T = (310 to 407) K |

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|------|----------|-----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| pvap | 2252.30  | kPa | 380.00 | Vapour pressures of isobutane at T = (310 to 407) K                                                                                                                                                  |  |
| pvap | 2252.30  | kPa | 380.00 | Vapour pressures of isobutane at T = (310 to 407) K                                                                                                                                                  |  |
| pvap | 2462.50  | kPa | 385.00 | Vapour pressures of isobutane at T = (310 to 407) K                                                                                                                                                  |  |
| pvap | 2687.80  | kPa | 390.00 | Vapour pressures of isobutane at T = (310 to 407) K                                                                                                                                                  |  |
| pvap | 2891.40  | kPa | 394.23 | Vapour pressures of isobutane at T = (310 to 407) K                                                                                                                                                  |  |
| pvap | 3088.70  | kPa | 398.12 | Vapour pressures of isobutane at T = (310 to 407) K                                                                                                                                                  |  |
| pvap | 3187.90  | kPa | 400.00 | Vapour pressures of isobutane at T = (310 to 407) K                                                                                                                                                  |  |
| pvap | 3466.20  | kPa | 405.00 | Vapour pressures of isobutane at T = (310 to 407) K                                                                                                                                                  |  |
| pvap | 3524.70  | kPa | 406.00 | Vapour pressures of isobutane at T = (310 to 407) K                                                                                                                                                  |  |
| pvap | 3584.30  | kPa | 407.00 | Vapour pressures of isobutane at T = (310 to 407) K                                                                                                                                                  |  |
| pvap | 1.30e-03 | kPa | 120.00 | Measurement of the (p,.rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |  |

|      |          |     |        |                                                                                                                                                                                                      |
|------|----------|-----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 2.30e-03 | kPa | 130.00 | Measurement of the (p,.rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 6.00e-03 | kPa | 140.00 | Measurement of the (p,.rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 0.02     | kPa | 150.00 | Measurement of the (p,.rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 0.09     | kPa | 160.00 | Measurement of the (p,.rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |

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|------|------|-----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap | 0.28 | kPa | 170.00 | Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 0.74 | kPa | 180.00 | Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 1.76 | kPa | 190.00 | Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 3.81 | kPa | 200.00 | Measurement of the (p,,rho.,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |

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| pvap | 7.58  | kPa | 210.00 | Measurement of the (p,ρ,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 14.02 | kPa | 220.00 | Measurement of the (p,ρ,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 24.39 | kPa | 230.00 | Measurement of the (p,ρ,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |
| pvap | 40.22 | kPa | 240.00 | Measurement of the (p,ρ,T) relation of propane, propylene, n-butane, and isobutane in the temperature range from (95 to 340) K at pressures up to 12 MPa using an accurate two-sinker densimeter |

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|-------|--------|---------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pvap  | 258.70 | kPa     | 288.15 | Vapor Liquid Equilibria of the trans-1,3,3,3-Tetrafluoropropene (R1234ze(E)) + Isobutane (R600a) System at Various Temperatures from (258.150 to 288.150) K |
| rhog  | 225.40 | kg/m3   | 407.79 | Critical Parameters for 2-Methylpropane (R600a)                                                                                                             |
| rhog  | 219.30 | kg/m3   | 407.79 | Critical Parameters for 2-Methylpropane (R600a)                                                                                                             |
| rhog  | 202.30 | kg/m3   | 407.76 | Critical Parameters for 2-Methylpropane (R600a)                                                                                                             |
| rhog  | 192.90 | kg/m3   | 407.65 | Critical Parameters for 2-Methylpropane (R600a)                                                                                                             |
| rhog  | 179.10 | kg/m3   | 407.21 | Critical Parameters for 2-Methylpropane (R600a)                                                                                                             |
| rhog  | 173.90 | kg/m3   | 407.03 | Critical Parameters for 2-Methylpropane (R600a)                                                                                                             |
| rhog  | 160.40 | kg/m3   | 406.17 | Critical Parameters for 2-Methylpropane (R600a)                                                                                                             |
| rhog  | 142.00 | kg/m3   | 404.54 | Critical Parameters for 2-Methylpropane (R600a)                                                                                                             |
| rhog  | 114.20 | kg/m3   | 398.81 | Critical Parameters for 2-Methylpropane (R600a)                                                                                                             |
| rhog  | 101.10 | kg/m3   | 394.98 | Critical Parameters for 2-Methylpropane (R600a)                                                                                                             |
| rhog  | 98.20  | kg/m3   | 393.73 | Critical Parameters for 2-Methylpropane (R600a)                                                                                                             |
| rhog  | 90.60  | kg/m3   | 391.40 | Critical Parameters for 2-Methylpropane (R600a)                                                                                                             |
| rhoI  | 557.00 | kg/m3   | 293.00 | KDB                                                                                                                                                         |
| sfust | 39.73  | J/mol×K | 113.20 | NIST Webbook                                                                                                                                                |

|       |       |         |        |                                                                                            |
|-------|-------|---------|--------|--------------------------------------------------------------------------------------------|
| sfust | 39.92 | J/mol×K | 113.74 | NIST Webbook                                                                               |
| srf   | 0.01  | N/m     | 327.80 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf   | 0.01  | N/m     | 329.49 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf   | 0.01  | N/m     | 329.49 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf   | 0.01  | N/m     | 331.68 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf   | 0.01  | N/m     | 327.80 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf   | 0.01  | N/m     | 325.37 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf   | 0.01  | N/m     | 325.37 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf   | 0.01  | N/m     | 323.71 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf   | 0.01  | N/m     | 323.71 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf   | 0.01  | N/m     | 321.96 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |

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|-----|------|-----|--------|--------------------------------------------------------------------------------------------|
| srf | 0.01 | N/m | 321.96 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 319.32 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 319.32 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 317.75 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 317.75 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 315.82 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 315.82 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 313.49 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 313.49 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 311.81 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |

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|-----|------|-----|--------|--------------------------------------------------------------------------------------------|
| srf | 0.01 | N/m | 311.81 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 309.49 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 309.49 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 307.41 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 307.41 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 305.75 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 305.75 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 303.91 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 303.91 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 301.43 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |

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|-----|------|-----|--------|--------------------------------------------------------------------------------------------|
| srf | 0.01 | N/m | 301.43 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 299.48 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 299.48 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 297.83 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 297.83 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 295.75 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 295.75 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 293.66 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 293.66 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 291.65 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |

|     |      |     |        |                                                                                            |
|-----|------|-----|--------|--------------------------------------------------------------------------------------------|
| srf | 0.01 | N/m | 291.65 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 289.31 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 289.31 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 287.50 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 287.50 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 285.43 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 285.43 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 283.29 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 283.29 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 281.30 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |

|     |      |     |        |                                                                                            |
|-----|------|-----|--------|--------------------------------------------------------------------------------------------|
| srf | 0.01 | N/m | 281.30 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 279.34 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 279.34 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 277.16 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 277.16 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 275.39 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 275.39 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 273.38 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 273.38 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 270.90 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |

|     |      |     |        |                                                                                            |
|-----|------|-----|--------|--------------------------------------------------------------------------------------------|
| srf | 0.01 | N/m | 270.90 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 268.86 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 268.86 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 267.09 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 267.09 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 264.86 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 264.86 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 262.95 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 262.95 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 261.09 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |

|     |      |     |        |                                                                                            |
|-----|------|-----|--------|--------------------------------------------------------------------------------------------|
| srf | 0.01 | N/m | 261.09 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 258.83 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 258.83 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 256.94 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 256.94 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 255.02 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.01 | N/m | 255.02 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.00 | N/m | 350.12 | Measurements of Surface Tension of R1234yf and R1234ze(E)                                  |
| srf | 0.01 | N/m | 331.68 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf | 0.00 | N/m | 345.39 | Measurements of Surface Tension of R1234yf and R1234ze(E)                                  |
| srf | 0.01 | N/m | 342.74 | Measurements of Surface Tension of R1234yf and R1234ze(E)                                  |

|     |      |     |        |                                                           |
|-----|------|-----|--------|-----------------------------------------------------------|
| srf | 0.01 | N/m | 340.42 | Measurements of Surface Tension of R1234yf and R1234ze(E) |
| srf | 0.01 | N/m | 338.10 | Measurements of Surface Tension of R1234yf and R1234ze(E) |
| srf | 0.01 | N/m | 335.58 | Measurements of Surface Tension of R1234yf and R1234ze(E) |
| srf | 0.01 | N/m | 332.56 | Measurements of Surface Tension of R1234yf and R1234ze(E) |
| srf | 0.01 | N/m | 330.18 | Measurements of Surface Tension of R1234yf and R1234ze(E) |
| srf | 0.01 | N/m | 329.85 | Measurements of Surface Tension of R1234yf and R1234ze(E) |
| srf | 0.01 | N/m | 327.83 | Measurements of Surface Tension of R1234yf and R1234ze(E) |
| srf | 0.01 | N/m | 325.44 | Measurements of Surface Tension of R1234yf and R1234ze(E) |
| srf | 0.01 | N/m | 323.41 | Measurements of Surface Tension of R1234yf and R1234ze(E) |
| srf | 0.01 | N/m | 320.46 | Measurements of Surface Tension of R1234yf and R1234ze(E) |
| srf | 0.01 | N/m | 318.22 | Measurements of Surface Tension of R1234yf and R1234ze(E) |
| srf | 0.01 | N/m | 315.62 | Measurements of Surface Tension of R1234yf and R1234ze(E) |
| srf | 0.01 | N/m | 313.15 | Measurements of Surface Tension of R1234yf and R1234ze(E) |
| srf | 0.01 | N/m | 310.75 | Measurements of Surface Tension of R1234yf and R1234ze(E) |
| srf | 0.01 | N/m | 307.43 | Measurements of Surface Tension of R1234yf and R1234ze(E) |

|     |      |     |        |                                                                                            |  |
|-----|------|-----|--------|--------------------------------------------------------------------------------------------|--|
| srf | 0.01 | N/m | 305.41 | Measurements of Surface Tension of R1234yf and R1234ze(E)                                  |  |
| srf | 0.01 | N/m | 302.08 | Measurements of Surface Tension of R1234yf and R1234ze(E)                                  |  |
| srf | 0.01 | N/m | 299.37 | Measurements of Surface Tension of R1234yf and R1234ze(E)                                  |  |
| srf | 0.01 | N/m | 296.42 | Measurements of Surface Tension of R1234yf and R1234ze(E)                                  |  |
| srf | 0.01 | N/m | 293.53 | Measurements of Surface Tension of R1234yf and R1234ze(E)                                  |  |
| srf | 0.01 | N/m | 290.14 | Measurements of Surface Tension of R1234yf and R1234ze(E)                                  |  |
| srf | 0.01 | N/m | 288.02 | Measurements of Surface Tension of R1234yf and R1234ze(E)                                  |  |
| srf | 0.01 | N/m | 285.45 | Measurements of Surface Tension of R1234yf and R1234ze(E)                                  |  |
| srf | 0.01 | N/m | 283.22 | Measurements of Surface Tension of R1234yf and R1234ze(E)                                  |  |
| srf | 0.01 | N/m | 333.28 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |  |
| srf | 0.01 | N/m | 280.34 | Measurements of Surface Tension of R1234yf and R1234ze(E)                                  |  |
| srf | 0.01 | N/m | 343.16 | Surface tension of ethyl fluoride (HFC161) from (233 to 373) K                             |  |
| srf | 0.01 | N/m | 338.17 | Surface tension of ethyl fluoride (HFC161) from (233 to 373) K                             |  |
| srf | 0.01 | N/m | 333.17 | Surface tension of ethyl fluoride (HFC161) from (233 to 373) K                             |  |

|     |      |     |        |                                                                              |
|-----|------|-----|--------|------------------------------------------------------------------------------|
| srf | 0.01 | N/m | 328.16 | Surface tension of ethyl fluoride (HFC161) from (233 to 373) K               |
| srf | 0.01 | N/m | 323.19 | Surface tension of ethyl fluoride (HFC161) from (233 to 373) K               |
| srf | 0.01 | N/m | 318.21 | Surface tension of ethyl fluoride (HFC161) from (233 to 373) K               |
| srf | 0.01 | N/m | 313.07 | Surface tension of ethyl fluoride (HFC161) from (233 to 373) K               |
| srf | 0.01 | N/m | 308.10 | Surface tension of ethyl fluoride (HFC161) from (233 to 373) K               |
| srf | 0.01 | N/m | 303.10 | Surface tension of ethyl fluoride (HFC161) from (233 to 373) K               |
| srf | 0.01 | N/m | 297.91 | Surface tension of ethyl fluoride (HFC161) from (233 to 373) K               |
| srf | 0.01 | N/m | 292.85 | Surface tension of ethyl fluoride (HFC161) from (233 to 373) K               |
| srf | 0.01 | N/m | 283.90 | Surface tension of ethyl fluoride (HFC161) from (233 to 373) K               |
| srf | 0.01 | N/m | 275.60 | Surface tension of ethyl fluoride (HFC161) from (233 to 373) K               |
| srf | 0.01 | N/m | 328.13 | Surface tension of pentafluoroethane + 1,1-difluoroethane from (243 to 328)K |
| srf | 0.01 | N/m | 328.12 | Surface tension of pentafluoroethane + 1,1-difluoroethane from (243 to 328)K |
| srf | 0.01 | N/m | 323.16 | Surface tension of pentafluoroethane + 1,1-difluoroethane from (243 to 328)K |

|       |       |         |        |                                                                                            |
|-------|-------|---------|--------|--------------------------------------------------------------------------------------------|
| srf   | 0.01  | N/m     | 318.13 | Surface tension of pentafluoroethane + 1,1-difluoroethane from (243 to 328)K               |
| srf   | 0.01  | N/m     | 313.17 | Surface tension of pentafluoroethane + 1,1-difluoroethane from (243 to 328)K               |
| srf   | 0.01  | N/m     | 293.20 | KDB                                                                                        |
| srf   | 0.01  | N/m     | 333.28 | Surface Tension Measurements of Propane (R-290) and Isobutane (R-600a) from (253 to 333) K |
| srf   | 0.00  | N/m     | 347.26 | Measurements of Surface Tension of R1234yf and R1234ze(E)                                  |
| svapt | 81.46 | J/mol×K | 261.44 | NIST Webbook                                                                               |

## Correlations

| Information                 | Value                         |
|-----------------------------|-------------------------------|
| Property code               | pvap                          |
| Equation                    | $\ln(P_{vp}) = A + B/(T + C)$ |
| Coeff. A                    | 1.39546e+01                   |
| Coeff. B                    | -2.19709e+03                  |
| Coeff. C                    | -2.60730e+01                  |
| Temperature range (K), min. | 186.83                        |
| Temperature range (K), max. | 280.27                        |

| Information                 | Value                                      |
|-----------------------------|--------------------------------------------|
| Property code               | pvap                                       |
| Equation                    | $\ln(P_{vp}) = A + B/T + C*\ln(T) + D*T^2$ |
| Coeff. A                    | 7.35135e+01                                |
| Coeff. B                    | -4.57713e+03                               |
| Coeff. C                    | -9.41672e+00                               |
| Coeff. D                    | 1.51428e-05                                |
| Temperature range (K), min. | 113.54                                     |
| Temperature range (K), max. | 408.14                                     |

# Datasets

## Viscosity, Pa\*s

| Temperature, K - Liquid | Pressure, kPa - Liquid | Viscosity, Pa*s - Liquid |
|-------------------------|------------------------|--------------------------|
| 273.15                  | 2000.00                | 0.0001970                |
| 273.15                  | 10000.00               | 0.0002170                |
| 273.15                  | 20000.00               | 0.0002410                |
| 273.15                  | 30000.00               | 0.0002610                |
| 293.15                  | 2000.00                | 0.0001620                |
| 293.15                  | 10000.00               | 0.0001790                |
| 293.15                  | 20000.00               | 0.0002000                |
| 293.15                  | 30000.00               | 0.0002190                |
| 313.15                  | 2000.00                | 0.0001320                |
| 313.15                  | 10000.00               | 0.0001490                |
| 313.15                  | 20000.00               | 0.0001670                |
| 313.15                  | 30000.00               | 0.0001860                |
| 333.15                  | 2000.00                | 0.0001090                |
| 333.15                  | 10000.00               | 0.0001260                |
| 333.15                  | 20000.00               | 0.0001450                |
| 333.15                  | 30000.00               | 0.0001610                |

Reference

<https://www.doi.org/10.1007/s10765-007-0259-y>

## Mass density, kg/m3

| Temperature, K - Fluid<br>(supercritical or subcritical<br>phases) | Pressure, kPa - Fluid<br>(supercritical or subcritical<br>phases) | Mass density, kg/m3 - Fluid<br>(supercritical or subcritical<br>phases) |
|--------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------|
| 360.00                                                             | 200000.00                                                         | 663.47                                                                  |
| 360.00                                                             | 180000.00                                                         | 655.03                                                                  |
| 360.00                                                             | 160000.00                                                         | 645.68                                                                  |
| 360.00                                                             | 140000.00                                                         | 635.51                                                                  |
| 360.00                                                             | 120000.00                                                         | 624.36                                                                  |
| 360.00                                                             | 100000.00                                                         | 611.74                                                                  |
| 360.00                                                             | 90000.00                                                          | 604.5                                                                   |

|        |           |        |
|--------|-----------|--------|
| 360.00 | 80000.00  | 597.04 |
| 360.00 | 70000.00  | 588.53 |
| 360.00 | 60000.00  | 579.25 |
| 360.00 | 50000.00  | 568.86 |
| 400.00 | 200000.00 | 646.22 |
| 400.00 | 180000.00 | 637.21 |
| 400.00 | 160000.00 | 627.09 |
| 400.00 | 140000.00 | 615.95 |
| 400.00 | 120000.00 | 603.57 |
| 400.00 | 100000.00 | 589.43 |
| 400.00 | 90000.00  | 581.56 |
| 400.00 | 80000.00  | 572.73 |
| 400.00 | 70000.00  | 563.06 |
| 400.00 | 60000.00  | 552.31 |
| 400.00 | 50000.00  | 539.91 |
| 440.00 | 200000.00 | 631.03 |
| 440.00 | 180000.00 | 621.17 |
| 440.00 | 160000.00 | 610.19 |
| 440.00 | 140000.00 | 598.12 |
| 440.00 | 120000.00 | 584.57 |
| 440.00 | 100000.00 | 568.96 |
| 440.00 | 90000.00  | 559.97 |
| 440.00 | 80000.00  | 550.28 |
| 440.00 | 70000.00  | 539.33 |
| 440.00 | 60000.00  | 526.93 |
| 440.00 | 50000.00  | 512.43 |
| 500.00 | 200000.00 | 607.94 |
| 500.00 | 180000.00 | 597.32 |
| 500.00 | 160000.00 | 585.63 |
| 500.00 | 140000.00 | 572.25 |
| 500.00 | 120000.00 | 557.0  |
| 500.00 | 100000.00 | 539.24 |
| 500.00 | 90000.00  | 529.04 |
| 500.00 | 80000.00  | 517.77 |
| 500.00 | 70000.00  | 504.87 |
| 500.00 | 60000.00  | 489.95 |
| 500.00 | 50000.00  | 472.16 |
| 550.00 | 200000.00 | 590.74 |
| 550.00 | 180000.00 | 579.21 |
| 550.00 | 160000.00 | 566.41 |
| 550.00 | 140000.00 | 551.94 |
| 550.00 | 120000.00 | 535.44 |
| 550.00 | 100000.00 | 515.83 |
| 550.00 | 90000.00  | 504.6  |

|        |           |        |
|--------|-----------|--------|
| 550.00 | 80000.00  | 492.04 |
| 550.00 | 70000.00  | 477.5  |
| 550.00 | 60000.00  | 460.74 |
| 550.00 | 50000.00  | 440.41 |
| 600.00 | 200000.00 | 573.91 |
| 600.00 | 180000.00 | 561.73 |
| 600.00 | 160000.00 | 548.14 |
| 600.00 | 140000.00 | 532.7  |
| 600.00 | 120000.00 | 515.09 |
| 600.00 | 100000.00 | 494.03 |
| 600.00 | 90000.00  | 481.73 |
| 600.00 | 80000.00  | 467.84 |
| 600.00 | 70000.00  | 451.97 |
| 600.00 | 60000.00  | 433.26 |
| 600.00 | 50000.00  | 410.52 |

Reference

<https://www.doi.org/10.1007/s10765-012-1383-x>

| Temperature, K | Pressure, kPa | Mass density, kg/m3 |
|----------------|---------------|---------------------|
| 280.00         | 210.80        | 573.48              |
| 280.00         | 222.50        | 573.44              |
| 280.00         | 234.00        | 573.52              |
| 280.00         | 245.70        | 573.58              |
| 280.00         | 257.40        | 573.62              |
| 280.00         | 269.20        | 573.58              |
| 280.00         | 280.90        | 573.68              |
| 300.00         | 372.60        | 548.57              |
| 300.00         | 384.20        | 548.64              |
| 300.00         | 395.90        | 548.66              |
| 300.00         | 407.60        | 548.64              |
| 300.00         | 419.20        | 548.67              |
| 300.00         | 430.90        | 548.71              |
| 300.00         | 442.60        | 548.7               |
| 320.00         | 641.10        | 521.58              |
| 320.00         | 652.80        | 521.63              |
| 320.00         | 664.40        | 521.65              |
| 320.00         | 676.10        | 521.72              |
| 320.00         | 687.80        | 521.75              |
| 320.00         | 699.40        | 521.8               |
| 320.00         | 711.10        | 521.85              |
| 340.00         | 1015.80       | 492.07              |
| 340.00         | 1027.40       | 492.12              |
| 340.00         | 1039.10       | 492.18              |

|        |         |        |
|--------|---------|--------|
| 340.00 | 1050.70 | 492.18 |
| 340.00 | 1062.40 | 492.21 |
| 340.00 | 1074.10 | 492.26 |
| 340.00 | 1085.80 | 492.22 |
| 360.00 | 1547.20 | 457.27 |
| 360.00 | 1558.80 | 457.4  |
| 360.00 | 1570.40 | 457.48 |
| 360.00 | 1582.10 | 457.56 |
| 360.00 | 1593.70 | 457.64 |
| 360.00 | 1605.30 | 457.74 |
| 360.00 | 1616.90 | 457.85 |
| 380.00 | 2262.90 | 413.23 |
| 380.00 | 2274.40 | 413.41 |
| 380.00 | 2286.00 | 413.58 |
| 380.00 | 2297.60 | 413.76 |
| 380.00 | 2309.10 | 413.92 |
| 380.00 | 2320.70 | 414.09 |
| 380.00 | 2332.30 | 414.23 |
| 400.00 | 3192.00 | 342.18 |
| 400.00 | 3202.90 | 343.05 |
| 400.00 | 3213.80 | 343.92 |
| 400.00 | 3224.80 | 344.67 |
| 400.00 | 3235.80 | 345.49 |
| 400.00 | 3246.80 | 346.19 |
| 400.00 | 3257.80 | 347.01 |
| 400.00 | 3268.80 | 347.76 |
| 405.00 | 3472.20 | 307.15 |
| 405.00 | 3481.20 | 309.53 |
| 405.00 | 3490.50 | 311.71 |
| 405.00 | 3500.20 | 313.58 |
| 405.00 | 3510.00 | 315.35 |
| 405.00 | 3519.90 | 316.99 |
| 405.00 | 3530.00 | 318.58 |
| 405.00 | 3540.20 | 319.98 |
| 406.00 | 3531.40 | 296.61 |
| 406.00 | 3539.40 | 299.74 |
| 406.00 | 3547.90 | 302.51 |
| 406.00 | 3556.70 | 304.98 |
| 406.00 | 3565.90 | 307.16 |
| 406.00 | 3575.30 | 309.2  |
| 406.00 | 3584.90 | 311.11 |
| 406.00 | 3594.80 | 312.82 |
| 407.00 | 3585.80 | 275.44 |
| 407.00 | 3587.30 | 278.66 |

|        |         |        |
|--------|---------|--------|
| 407.00 | 3592.30 | 283.68 |
| 407.00 | 3597.90 | 287.86 |
| 407.00 | 3605.00 | 291.49 |
| 407.00 | 3612.90 | 294.64 |
| 407.00 | 3621.10 | 297.52 |
| 407.00 | 3629.90 | 300.02 |
| 407.00 | 3639.50 | 302.33 |
| 407.00 | 3648.70 | 304.5  |
| 407.00 | 3658.20 | 306.49 |

Reference

<https://www.doi.org/10.1016/j.jct.2008.04.003>

| Temperature, K | Pressure, kPa | Mass density, kg/m3 |
|----------------|---------------|---------------------|
| 293.15         | 646.80        | 556.91              |

Reference

<https://www.doi.org/10.1021/acs.jced.6b00980>

## Speed of sound, m/s

| Temperature, K - Liquid | Pressure, kPa - Liquid | Speed of sound, m/s - Liquid |
|-------------------------|------------------------|------------------------------|
| 199.99                  | 409.39                 | 1393.64                      |
| 199.99                  | 599.71                 | 1394.87                      |
| 199.99                  | 1103.57                | 1398.12                      |
| 199.99                  | 2104.34                | 1404.51                      |
| 199.99                  | 3104.91                | 1410.84                      |
| 199.99                  | 4105.68                | 1417.1                       |
| 199.99                  | 5106.27                | 1423.3                       |
| 199.99                  | 6107.04                | 1429.43                      |
| 199.99                  | 7107.79                | 1435.5                       |
| 199.99                  | 8108.46                | 1441.51                      |
| 199.99                  | 9109.12                | 1447.47                      |
| 199.99                  | 10109.80               | 1453.36                      |
| 199.99                  | 12611.50               | 1467.82                      |
| 199.99                  | 15113.20               | 1481.96                      |
| 199.99                  | 17615.00               | 1495.8                       |
| 199.99                  | 20116.80               | 1509.31                      |
| 199.99                  | 25120.30               | 1535.59                      |
| 199.99                  | 30124.10               | 1560.85                      |
| 199.99                  | 35127.50               | 1585.23                      |
| 199.99                  | 40130.90               | 1608.73                      |

|        |           |         |
|--------|-----------|---------|
| 199.99 | 45134.40  | 1631.48 |
| 199.99 | 50137.80  | 1653.49 |
| 199.99 | 60144.70  | 1695.78 |
| 199.99 | 70151.70  | 1735.8  |
| 199.99 | 80158.30  | 1773.84 |
| 200.00 | 90165.70  | 1810.11 |
| 200.00 | 100173.00 | 1844.91 |
| 220.00 | 1103.16   | 1276.93 |
| 220.00 | 2103.80   | 1284.26 |
| 220.00 | 3102.94   | 1291.51 |
| 220.00 | 3104.43   | 1291.5  |
| 220.00 | 4105.15   | 1298.64 |
| 220.00 | 5105.18   | 1305.69 |
| 220.00 | 6105.99   | 1312.66 |
| 220.00 | 7106.65   | 1319.54 |
| 220.00 | 8107.32   | 1326.33 |
| 220.00 | 9107.99   | 1333.04 |
| 220.00 | 10108.70  | 1339.68 |
| 220.00 | 10109.60  | 1339.68 |
| 220.00 | 12610.40  | 1355.99 |
| 220.00 | 15112.20  | 1371.76 |
| 220.00 | 17614.10  | 1387.18 |
| 220.00 | 20115.80  | 1402.2  |
| 220.00 | 20115.90  | 1402.2  |
| 220.00 | 20116.60  | 1402.21 |
| 220.00 | 25119.30  | 1431.23 |
| 220.00 | 30122.80  | 1458.98 |
| 220.00 | 30123.60  | 1458.98 |
| 220.00 | 35126.30  | 1485.59 |
| 220.00 | 40129.90  | 1511.18 |
| 220.00 | 40130.60  | 1511.2  |
| 220.00 | 45133.80  | 1535.85 |
| 220.00 | 50137.30  | 1559.73 |
| 220.00 | 60144.30  | 1605.15 |
| 220.00 | 70151.30  | 1647.96 |
| 220.00 | 80158.30  | 1688.49 |
| 220.00 | 90165.30  | 1727.05 |
| 220.00 | 100172.00 | 1763.85 |
| 240.00 | 402.14    | 1153.03 |
| 240.00 | 402.77    | 1153.03 |
| 240.00 | 602.82    | 1154.75 |
| 240.00 | 1103.62   | 1159.04 |
| 240.00 | 2103.87   | 1167.5  |
| 240.00 | 2104.32   | 1167.5  |

|        |           |         |
|--------|-----------|---------|
| 240.00 | 3104.94   | 1175.82 |
| 240.00 | 4105.69   | 1184.0  |
| 240.00 | 5106.26   | 1192.06 |
| 240.00 | 6107.21   | 1199.99 |
| 240.00 | 7107.99   | 1207.8  |
| 240.00 | 8108.09   | 1215.51 |
| 240.00 | 8109.32   | 1215.5  |
| 240.00 | 9110.06   | 1223.09 |
| 240.00 | 10110.80  | 1230.57 |
| 240.00 | 12612.60  | 1248.84 |
| 240.00 | 15113.10  | 1266.49 |
| 240.00 | 15114.30  | 1266.52 |
| 240.00 | 17616.10  | 1283.66 |
| 240.00 | 20117.80  | 1300.31 |
| 240.00 | 25121.30  | 1332.26 |
| 240.00 | 30123.50  | 1362.62 |
| 240.00 | 30124.90  | 1362.63 |
| 240.00 | 35128.40  | 1391.6  |
| 240.00 | 40132.00  | 1419.31 |
| 240.00 | 45135.40  | 1445.92 |
| 240.00 | 50138.80  | 1471.53 |
| 240.00 | 60145.70  | 1520.12 |
| 240.00 | 70152.70  | 1565.65 |
| 240.00 | 80159.60  | 1608.58 |
| 240.00 | 90166.60  | 1649.26 |
| 240.00 | 100174.00 | 1687.97 |
| 260.00 | 402.73    | 1036.78 |
| 260.00 | 405.47    | 1036.74 |
| 260.00 | 607.87    | 1038.79 |
| 260.00 | 1106.38   | 1043.75 |
| 260.00 | 2103.99   | 1053.64 |
| 260.00 | 2107.11   | 1053.6  |
| 260.00 | 3107.75   | 1063.23 |
| 260.00 | 4108.41   | 1072.67 |
| 260.00 | 5109.08   | 1081.92 |
| 260.00 | 6109.71   | 1090.98 |
| 260.00 | 7111.04   | 1099.89 |
| 259.99 | 8108.13   | 1108.68 |
| 260.00 | 8111.73   | 1108.64 |
| 260.00 | 9112.38   | 1117.24 |
| 260.00 | 10113.00  | 1125.7  |
| 260.00 | 12614.70  | 1146.23 |
| 259.99 | 15113.00  | 1166.01 |
| 260.00 | 15116.40  | 1165.99 |

|        |           |         |
|--------|-----------|---------|
| 260.00 | 17618.10  | 1185.04 |
| 260.00 | 20119.70  | 1203.45 |
| 260.00 | 25123.20  | 1238.56 |
| 259.99 | 30123.30  | 1271.71 |
| 260.00 | 30126.60  | 1271.68 |
| 260.00 | 35130.10  | 1303.07 |
| 260.00 | 40133.60  | 1332.96 |
| 260.00 | 45136.70  | 1361.51 |
| 260.00 | 50140.20  | 1388.89 |
| 260.00 | 60147.10  | 1440.56 |
| 260.00 | 70154.10  | 1488.73 |
| 260.00 | 80161.20  | 1533.91 |
| 260.00 | 90168.30  | 1576.63 |
| 260.00 | 100175.00 | 1617.15 |
| 280.00 | 402.43    | 921.857 |
| 280.00 | 602.22    | 924.249 |
| 280.00 | 606.25    | 924.301 |
| 280.00 | 1103.21   | 930.186 |
| 280.00 | 2103.86   | 941.794 |
| 280.00 | 3104.45   | 953.084 |
| 280.00 | 4105.10   | 964.082 |
| 280.00 | 5105.72   | 974.802 |
| 280.00 | 6106.29   | 985.258 |
| 280.00 | 7106.98   | 995.499 |
| 280.00 | 8107.90   | 1005.49 |
| 280.00 | 9108.60   | 1015.28 |
| 280.00 | 10109.30  | 1024.93 |
| 280.00 | 12611.00  | 1048.01 |
| 280.00 | 15112.70  | 1070.13 |
| 280.00 | 17614.40  | 1091.28 |
| 280.00 | 20116.10  | 1111.62 |
| 280.00 | 25119.40  | 1150.11 |
| 280.00 | 30122.90  | 1186.12 |
| 280.00 | 35126.40  | 1220.02 |
| 280.00 | 40129.70  | 1252.1  |
| 280.00 | 45133.30  | 1282.63 |
| 280.00 | 50136.70  | 1311.76 |
| 280.00 | 60143.70  | 1366.43 |
| 280.00 | 70150.70  | 1417.14 |
| 280.00 | 80157.60  | 1464.56 |
| 280.00 | 90164.40  | 1509.1  |
| 280.00 | 100171.00 | 1551.25 |
| 300.00 | 601.97    | 809.823 |
| 300.00 | 1103.09   | 817.035 |

|        |           |         |
|--------|-----------|---------|
| 300.00 | 1103.42   | 817.08  |
| 300.01 | 2103.88   | 831.017 |
| 299.99 | 3104.56   | 844.544 |
| 300.00 | 4105.32   | 857.548 |
| 300.00 | 5106.01   | 870.136 |
| 300.00 | 5106.34   | 870.124 |
| 300.00 | 6106.49   | 882.338 |
| 300.00 | 7107.46   | 894.168 |
| 300.00 | 8108.12   | 905.68  |
| 300.00 | 9108.67   | 916.91  |
| 300.00 | 10109.30  | 927.826 |
| 300.00 | 12611.10  | 954.014 |
| 300.00 | 15112.80  | 978.777 |
| 300.00 | 17614.50  | 1002.31 |
| 300.00 | 20116.30  | 1024.76 |
| 300.00 | 25119.70  | 1066.88 |
| 300.00 | 25120.10  | 1066.88 |
| 300.00 | 30123.10  | 1105.91 |
| 300.00 | 35126.60  | 1142.38 |
| 300.00 | 40130.60  | 1176.71 |
| 300.00 | 45134.10  | 1209.19 |
| 300.00 | 50137.50  | 1240.06 |
| 300.00 | 60144.40  | 1297.71 |
| 300.00 | 70151.40  | 1350.85 |
| 300.00 | 80158.30  | 1400.29 |
| 300.00 | 90165.20  | 1446.65 |
| 300.00 | 100172.00 | 1490.39 |
| 320.00 | 1103.34   | 702.165 |
| 320.00 | 1103.69   | 702.18  |
| 320.00 | 1105.90   | 702.158 |
| 320.00 | 2106.48   | 719.58  |
| 320.00 | 3107.11   | 736.107 |
| 320.00 | 5106.25   | 766.908 |
| 320.00 | 5106.52   | 766.924 |
| 320.00 | 5108.33   | 766.899 |
| 320.00 | 6108.33   | 781.335 |
| 320.00 | 7108.99   | 795.231 |
| 320.00 | 8109.75   | 808.636 |
| 320.00 | 9110.44   | 821.595 |
| 320.00 | 10109.30  | 834.147 |
| 320.00 | 10109.60  | 834.156 |
| 320.00 | 10109.60  | 834.158 |
| 320.00 | 10109.60  | 834.155 |
| 320.01 | 12612.40  | 863.872 |

|        |           |         |
|--------|-----------|---------|
| 320.00 | 15114.10  | 891.73  |
| 320.00 | 17615.80  | 917.892 |
| 320.00 | 20117.50  | 942.655 |
| 320.00 | 25121.00  | 988.667 |
| 320.00 | 30122.90  | 1030.84 |
| 320.00 | 30124.50  | 1030.86 |
| 320.00 | 35128.10  | 1069.96 |
| 319.99 | 40131.60  | 1106.52 |
| 319.99 | 45135.10  | 1140.94 |
| 320.00 | 50136.40  | 1173.48 |
| 320.00 | 50138.60  | 1173.47 |
| 320.00 | 60145.60  | 1233.99 |
| 320.00 | 70152.60  | 1289.46 |
| 320.00 | 80159.50  | 1340.85 |
| 320.00 | 90166.60  | 1388.87 |
| 320.00 | 100174.00 | 1434.04 |
| 340.00 | 2104.02   | 604.55  |
| 340.00 | 2104.18   | 604.632 |
| 340.00 | 3104.76   | 625.77  |
| 340.00 | 4105.50   | 645.516 |
| 340.00 | 5106.01   | 664.099 |
| 340.00 | 5106.03   | 664.098 |
| 340.00 | 5106.21   | 664.038 |
| 340.00 | 6106.73   | 681.524 |
| 340.00 | 7107.52   | 698.119 |
| 340.00 | 8108.31   | 713.936 |
| 340.00 | 9109.08   | 729.07  |
| 340.00 | 10109.40  | 743.63  |
| 340.00 | 10109.80  | 743.591 |
| 340.00 | 12611.60  | 777.604 |
| 340.00 | 15113.40  | 808.909 |
| 340.00 | 17615.90  | 838.023 |
| 340.00 | 20117.60  | 865.302 |
| 340.00 | 25121.20  | 915.431 |
| 340.00 | 30122.90  | 960.884 |
| 340.00 | 30124.70  | 960.871 |
| 340.00 | 35128.20  | 1002.64 |
| 340.00 | 40129.70  | 1041.43 |
| 340.00 | 40131.70  | 1041.42 |
| 340.00 | 45135.20  | 1077.73 |
| 340.00 | 50139.60  | 1111.95 |
| 340.00 | 60146.70  | 1175.2  |
| 340.00 | 70153.60  | 1232.86 |
| 340.00 | 80159.30  | 1286.05 |

|        |           |         |
|--------|-----------|---------|
| 340.00 | 90166.40  | 1335.6  |
| 340.00 | 100173.00 | 1382.09 |
| 360.00 | 2104.44   | 480.036 |
| 360.00 | 3105.16   | 509.763 |
| 360.00 | 4105.90   | 536.085 |
| 360.00 | 5104.49   | 559.919 |
| 360.00 | 5104.89   | 559.906 |
| 360.00 | 6107.23   | 581.763 |
| 360.00 | 7107.97   | 602.064 |
| 360.00 | 8109.68   | 621.091 |
| 360.00 | 9110.36   | 639.005 |
| 360.00 | 10108.50  | 655.983 |
| 360.00 | 10108.50  | 655.983 |
| 360.00 | 10111.00  | 655.987 |
| 360.00 | 12612.70  | 695.082 |
| 360.00 | 15114.40  | 730.375 |
| 360.00 | 17616.10  | 762.732 |
| 360.00 | 20117.80  | 792.713 |
| 360.00 | 25121.30  | 847.155 |
| 360.00 | 30124.80  | 895.898 |
| 360.00 | 35128.30  | 940.304 |
| 360.00 | 40131.80  | 981.263 |
| 360.00 | 45135.20  | 1019.4  |
| 360.00 | 50136.50  | 1055.19 |
| 360.00 | 50136.60  | 1055.18 |
| 360.00 | 50138.50  | 1055.17 |
| 360.00 | 60145.50  | 1121.01 |
| 360.00 | 70152.40  | 1180.71 |
| 360.00 | 80159.30  | 1235.59 |
| 360.00 | 90166.20  | 1286.55 |
| 360.00 | 100173.00 | 1334.25 |
| 380.00 | 3104.52   | 378.472 |
| 380.00 | 3604.06   | 399.559 |
| 380.00 | 4105.17   | 418.485 |
| 380.00 | 5105.82   | 451.633 |
| 380.00 | 6106.48   | 480.42  |
| 380.00 | 7107.17   | 506.126 |
| 380.00 | 8107.82   | 529.515 |
| 380.00 | 8109.55   | 529.517 |
| 380.00 | 9107.54   | 551.097 |
| 380.00 | 9107.91   | 551.063 |
| 380.00 | 10108.50  | 571.152 |
| 380.00 | 10110.80  | 571.161 |
| 380.00 | 10110.90  | 571.156 |

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|--------|-----------|---------|
| 380.00 | 10110.90  | 571.161 |
| 380.00 | 12610.30  | 616.323 |
| 380.00 | 15112.10  | 656.145 |
| 380.00 | 15114.40  | 656.153 |
| 380.00 | 17613.90  | 692.042 |
| 380.00 | 20115.10  | 724.919 |
| 380.01 | 20115.10  | 724.92  |
| 380.00 | 20115.70  | 724.902 |
| 380.00 | 25119.50  | 783.755 |
| 380.00 | 25121.30  | 783.746 |
| 380.00 | 30123.10  | 835.784 |
| 380.00 | 35126.60  | 882.757 |
| 380.00 | 40130.30  | 925.806 |
| 380.00 | 45133.80  | 965.685 |
| 380.01 | 50135.50  | 1002.94 |
| 380.01 | 50135.50  | 1002.94 |
| 380.00 | 50137.40  | 1002.95 |
| 380.00 | 60144.40  | 1071.17 |
| 380.00 | 70152.50  | 1132.76 |
| 380.00 | 80159.60  | 1189.17 |
| 380.00 | 90166.70  | 1241.41 |
| 380.00 | 100174.00 | 1290.2  |
| 400.00 | 4606.13   | 309.144 |
| 400.00 | 5106.40   | 334.246 |
| 400.00 | 6107.17   | 375.601 |
| 400.00 | 7108.08   | 409.756 |
| 400.00 | 8108.80   | 439.33  |
| 400.00 | 8109.32   | 439.326 |
| 400.00 | 9109.50   | 465.689 |
| 400.00 | 10110.20  | 489.633 |
| 400.00 | 10110.90  | 489.633 |
| 400.00 | 12612.00  | 541.93  |
| 400.00 | 15113.80  | 586.714 |
| 400.00 | 15114.40  | 586.717 |
| 400.00 | 17615.60  | 626.338 |
| 400.00 | 20117.40  | 662.123 |
| 400.00 | 25122.20  | 725.354 |
| 400.00 | 30125.60  | 780.545 |
| 400.00 | 35129.10  | 829.947 |
| 400.00 | 40132.50  | 874.936 |
| 400.00 | 45135.90  | 916.424 |
| 400.00 | 50139.30  | 955.046 |
| 400.00 | 60146.20  | 1025.46 |
| 400.00 | 70153.10  | 1088.74 |

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|--------|-----------|---------|
| 400.00 | 80160.00  | 1146.53 |
| 400.00 | 90166.90  | 1199.91 |
| 400.00 | 100174.00 | 1249.68 |

Reference

<https://www.doi.org/10.1021/acs.jced.8b00202>

## Molar heat capacity at constant volume, J/K/mol

| Temperature, K - Fluid<br>(supercritical or subcritical<br>phases) | Pressure, kPa - Fluid<br>(supercritical or subcritical<br>phases) | Molar heat capacity at constant<br>volume, J/K/mol - Fluid<br>(supercritical or subcritical<br>phases) |
|--------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| 415.15                                                             | 4254.00                                                           | 222.0849                                                                                               |
| 415.15                                                             | 4254.00                                                           | 230.8033                                                                                               |
| 420.15                                                             | 4664.00                                                           | 202.6721                                                                                               |
| 420.15                                                             | 4665.00                                                           | 202.9627                                                                                               |
| 425.15                                                             | 5082.00                                                           | 186.0492                                                                                               |
| 425.15                                                             | 5083.00                                                           | 187.0954                                                                                               |

Reference

<https://www.doi.org/10.1007/s10765-005-8592-5>

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

| Temperature, K - Liquid | Pressure, kPa - Liquid | Molar heat capacity at constant<br>pressure, J/K/mol - Liquid |
|-------------------------|------------------------|---------------------------------------------------------------|
| 303.53                  | 1050.00                | 142.52                                                        |
| 303.55                  | 1540.00                | 141.88                                                        |
| 303.56                  | 2000.00                | 141.53                                                        |
| 303.57                  | 2500.00                | 140.83                                                        |
| 303.56                  | 3020.00                | 140.13                                                        |
| 303.70                  | 3480.00                | 139.78                                                        |
| 303.62                  | 4030.00                | 139.55                                                        |
| 303.62                  | 4500.00                | 139.32                                                        |
| 303.64                  | 5000.00                | 139.03                                                        |
| 303.65                  | 5520.00                | 138.80                                                        |
| 303.63                  | 6010.00                | 138.45                                                        |
| 303.62                  | 6500.00                | 138.10                                                        |
| 303.63                  | 7030.00                | 137.69                                                        |
| 303.63                  | 7530.00                | 137.34                                                        |
| 303.62                  | 7990.00                | 136.88                                                        |

|        |          |        |
|--------|----------|--------|
| 303.63 | 8510.00  | 136.70 |
| 303.64 | 9000.00  | 136.47 |
| 303.63 | 9510.00  | 136.24 |
| 303.59 | 9990.00  | 135.77 |
| 303.86 | 10530.00 | 135.37 |
| 303.86 | 11040.00 | 134.96 |
| 303.82 | 11510.00 | 134.38 |
| 303.82 | 12000.00 | 134.20 |
| 313.48 | 1040.00  | 142.81 |
| 313.51 | 1540.00  | 142.46 |
| 313.51 | 2020.00  | 141.93 |
| 313.51 | 2540.00  | 141.53 |
| 313.49 | 3020.00  | 141.12 |
| 313.58 | 3550.00  | 140.95 |
| 313.51 | 4010.00  | 140.60 |
| 313.52 | 4500.00  | 140.07 |
| 313.54 | 5080.00  | 139.26 |
| 313.50 | 5530.00  | 139.09 |
| 313.50 | 6030.00  | 138.56 |
| 313.48 | 6480.00  | 138.39 |
| 313.50 | 7030.00  | 138.27 |
| 313.49 | 7500.00  | 138.10 |
| 313.50 | 8040.00  | 137.81 |
| 313.50 | 8480.00  | 137.69 |
| 313.51 | 9020.00  | 137.52 |
| 313.52 | 9480.00  | 137.34 |
| 313.52 | 10060.00 | 137.28 |
| 313.55 | 10530.00 | 136.59 |
| 313.58 | 11070.00 | 136.47 |
| 313.57 | 11480.00 | 136.30 |
| 313.57 | 12050.00 | 136.12 |
| 323.11 | 1040.00  | 146.53 |
| 323.16 | 1510.00  | 146.24 |
| 323.22 | 2020.00  | 145.77 |
| 323.24 | 2540.00  | 145.01 |
| 323.25 | 3020.00  | 144.49 |
| 323.23 | 3510.00  | 144.03 |
| 323.25 | 4020.00  | 143.62 |
| 323.28 | 4550.00  | 143.33 |
| 323.30 | 4970.00  | 143.04 |
| 323.32 | 5500.00  | 142.69 |
| 323.32 | 5980.00  | 142.17 |
| 323.33 | 6470.00  | 141.70 |
| 323.33 | 7020.00  | 141.30 |

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|--------|----------|--------|
| 323.35 | 7470.00  | 141.24 |
| 323.37 | 7990.00  | 141.00 |
| 323.38 | 8510.00  | 140.77 |
| 323.39 | 9000.00  | 140.42 |
| 323.37 | 9480.00  | 140.07 |
| 323.38 | 9990.00  | 139.67 |
| 323.27 | 10500.00 | 139.49 |
| 323.28 | 10980.00 | 139.44 |
| 323.31 | 11540.00 | 139.38 |
| 323.34 | 11990.00 | 139.20 |
| 333.64 | 1050.00  | 151.06 |
| 333.69 | 1530.00  | 150.48 |
| 333.72 | 2020.00  | 149.84 |
| 333.72 | 2520.00  | 149.20 |
| 333.73 | 3050.00  | 148.79 |
| 333.71 | 3530.00  | 147.63 |
| 333.67 | 4020.00  | 147.05 |
| 333.67 | 4480.00  | 146.76 |
| 333.69 | 5010.00  | 146.41 |
| 333.70 | 5530.00  | 146.12 |
| 333.66 | 5960.00  | 145.65 |
| 333.70 | 6520.00  | 145.54 |
| 333.69 | 7030.00  | 145.31 |
| 333.73 | 7550.00  | 145.13 |
| 333.74 | 8040.00  | 145.13 |
| 333.71 | 8510.00  | 144.43 |
| 333.72 | 8970.00  | 144.38 |
| 333.67 | 9460.00  | 143.50 |
| 333.68 | 10010.00 | 143.62 |
| 333.65 | 10550.00 | 143.33 |
| 333.65 | 10920.00 | 143.21 |
| 333.66 | 11520.00 | 143.15 |
| 333.67 | 11930.00 | 143.15 |
| 343.71 | 1520.00  | 159.49 |
| 343.76 | 2030.00  | 157.92 |
| 343.81 | 2530.00  | 157.34 |
| 343.81 | 3030.00  | 155.65 |
| 343.79 | 3510.00  | 155.13 |
| 343.83 | 4010.00  | 154.02 |
| 343.85 | 4530.00  | 153.62 |
| 343.84 | 5010.00  | 153.09 |
| 343.86 | 5490.00  | 151.93 |
| 343.85 | 6000.00  | 151.06 |
| 343.86 | 6530.00  | 150.36 |

|        |          |        |
|--------|----------|--------|
| 343.88 | 7020.00  | 150.07 |
| 343.85 | 7500.00  | 149.49 |
| 343.85 | 8000.00  | 148.27 |
| 343.85 | 8500.00  | 147.98 |
| 343.87 | 9000.00  | 147.51 |
| 343.88 | 9490.00  | 147.40 |
| 343.86 | 10020.00 | 146.82 |
| 343.87 | 10510.00 | 146.47 |
| 343.85 | 10990.00 | 145.77 |
| 343.86 | 11480.00 | 145.48 |
| 343.85 | 12010.00 | 145.07 |
| 353.90 | 1540.00  | 168.38 |
| 353.88 | 2000.00  | 166.17 |
| 353.82 | 2510.00  | 163.90 |
| 353.85 | 3020.00  | 162.57 |
| 353.88 | 3510.00  | 160.94 |
| 353.90 | 4000.00  | 160.01 |
| 353.86 | 4510.00  | 158.62 |
| 353.87 | 4990.00  | 158.09 |
| 353.89 | 5510.00  | 157.05 |
| 353.87 | 6010.00  | 156.06 |
| 353.89 | 6510.00  | 155.42 |
| 353.87 | 7000.00  | 153.97 |
| 353.88 | 7510.00  | 153.15 |
| 353.90 | 7990.00  | 152.75 |
| 353.87 | 8520.00  | 152.22 |
| 353.85 | 9000.00  | 152.16 |
| 353.85 | 9500.00  | 151.70 |
| 353.87 | 10000.00 | 151.35 |
| 353.87 | 10510.00 | 151.00 |
| 353.87 | 10990.00 | 150.71 |
| 353.87 | 11500.00 | 150.42 |
| 353.88 | 12010.00 | 149.90 |
| 363.86 | 2090.00  | 174.19 |
| 363.91 | 2520.00  | 171.93 |
| 363.93 | 3000.00  | 170.01 |
| 363.97 | 3510.00  | 167.22 |
| 363.96 | 4040.00  | 165.71 |
| 363.98 | 4500.00  | 164.66 |
| 363.92 | 5030.00  | 162.80 |
| 363.94 | 5510.00  | 161.75 |
| 363.96 | 6000.00  | 160.88 |
| 363.92 | 6510.00  | 159.43 |
| 363.93 | 7000.00  | 158.50 |

|        |          |        |
|--------|----------|--------|
| 363.96 | 7510.00  | 157.92 |
| 363.92 | 8020.00  | 156.81 |
| 363.94 | 8500.00  | 156.12 |
| 363.97 | 8990.00  | 155.13 |
| 363.98 | 9510.00  | 154.20 |
| 363.96 | 9970.00  | 153.91 |
| 363.96 | 10510.00 | 153.09 |
| 363.97 | 11000.00 | 152.75 |
| 364.00 | 11540.00 | 152.34 |
| 363.95 | 11990.00 | 152.05 |
| 373.85 | 2530.00  | 186.46 |
| 373.92 | 3010.00  | 182.39 |
| 373.97 | 3530.00  | 179.02 |
| 373.93 | 4020.00  | 175.30 |
| 373.92 | 4500.00  | 172.97 |
| 373.95 | 5020.00  | 171.34 |
| 373.90 | 5520.00  | 169.02 |
| 373.90 | 6000.00  | 167.45 |
| 373.94 | 6520.00  | 166.64 |
| 373.85 | 7050.00  | 164.54 |
| 373.87 | 7520.00  | 163.73 |
| 373.89 | 7980.00  | 162.86 |
| 373.92 | 8520.00  | 162.10 |
| 373.91 | 9020.00  | 161.23 |
| 373.89 | 9480.00  | 160.48 |
| 373.90 | 10000.00 | 159.78 |
| 373.98 | 10490.00 | 158.44 |
| 373.95 | 11010.00 | 158.15 |
| 373.95 | 11470.00 | 157.45 |
| 373.95 | 11990.00 | 157.10 |
| 383.20 | 2550.00  | 209.82 |
| 383.35 | 3010.00  | 201.04 |
| 383.42 | 3490.00  | 193.84 |
| 383.30 | 3960.00  | 188.32 |
| 383.34 | 4500.00  | 183.72 |
| 383.32 | 4990.00  | 179.89 |
| 383.44 | 5490.00  | 177.21 |
| 383.21 | 6010.00  | 173.96 |
| 383.26 | 6520.00  | 171.81 |
| 383.92 | 6990.00  | 170.65 |
| 383.96 | 7520.00  | 169.54 |
| 383.94 | 7980.00  | 168.55 |
| 383.97 | 8470.00  | 166.75 |
| 383.95 | 9030.00  | 164.95 |

|        |          |        |
|--------|----------|--------|
| 383.94 | 9460.00  | 164.25 |
| 383.92 | 9990.00  | 163.61 |
| 383.93 | 10490.00 | 161.70 |
| 383.94 | 11010.00 | 160.71 |
| 383.94 | 11570.00 | 159.37 |
| 383.93 | 12090.00 | 159.14 |
| 393.96 | 3090.00  | 248.47 |
| 393.95 | 3560.00  | 222.96 |
| 394.04 | 4060.00  | 208.37 |
| 393.93 | 4520.00  | 197.56 |
| 393.99 | 4980.00  | 192.79 |
| 394.06 | 5490.00  | 187.33 |
| 394.02 | 6000.00  | 183.49 |
| 394.05 | 6500.00  | 180.59 |
| 393.99 | 7000.00  | 177.62 |
| 394.01 | 7500.00  | 176.28 |
| 394.00 | 8010.00  | 174.60 |
| 394.03 | 8510.00  | 173.38 |
| 393.99 | 9000.00  | 170.47 |
| 394.00 | 9500.00  | 169.60 |
| 394.05 | 9990.00  | 168.03 |
| 394.09 | 10520.00 | 167.28 |
| 394.03 | 11010.00 | 166.75 |
| 394.05 | 11510.00 | 165.53 |
| 394.02 | 12020.00 | 165.30 |
| 403.41 | 4080.00  | 248.65 |
| 403.41 | 4510.00  | 227.20 |
| 403.43 | 5070.00  | 209.76 |
| 403.44 | 5520.00  | 201.92 |
| 403.52 | 6010.00  | 195.93 |
| 403.51 | 6500.00  | 192.50 |
| 403.53 | 6990.00  | 189.01 |
| 403.58 | 7550.00  | 184.77 |
| 403.51 | 8000.00  | 180.88 |
| 403.50 | 8500.00  | 177.97 |
| 403.53 | 8990.00  | 175.94 |
| 403.55 | 9510.00  | 174.54 |
| 403.49 | 9990.00  | 173.15 |
| 403.54 | 10490.00 | 172.91 |
| 403.53 | 10960.00 | 172.80 |
| 403.55 | 11490.00 | 172.16 |
| 403.53 | 12000.00 | 170.65 |

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## Legend

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|               |                                                 |
|---------------|-------------------------------------------------|
| <b>af:</b>    | Acentric Factor                                 |
| <b>affp:</b>  | Proton affinity                                 |
| <b>aigt:</b>  | Autoignition Temperature                        |
| <b>ap:</b>    | Aniline Point                                   |
| <b>basg:</b>  | Gas basicity                                    |
| <b>chg:</b>   | Standard gas enthalpy of combustion             |
| <b>cpg:</b>   | Ideal gas heat capacity                         |
| <b>cpl:</b>   | Liquid phase heat capacity                      |
| <b>dm:</b>    | Dipole Moment                                   |
| <b>dvisc:</b> | Dynamic viscosity                               |
| <b>fl:</b>    | Lower Flammability Limit                        |
| <b>flu:</b>   | Upper Flammability Limit                        |
| <b>fpo:</b>   | Flash Point (Open Cup Method)                   |
| <b>gf:</b>    | Standard Gibbs free energy of formation         |
| <b>gyrad:</b> | Radius of Gyration                              |
| <b>hcg:</b>   | Heat of Combustion, Gross form                  |
| <b>hcn:</b>   | Heat of Combustion, Net Form                    |
| <b>hf:</b>    | Enthalpy of formation at standard conditions    |
| <b>hfus:</b>  | Enthalpy of fusion at standard conditions       |
| <b>hfust:</b> | Enthalpy of fusion at a given temperature       |
| <b>hvap:</b>  | Enthalpy of vaporization at standard conditions |
| <b>hvapt:</b> | Enthalpy of vaporization at a given temperature |

|                 |                                                   |
|-----------------|---------------------------------------------------|
| <b>ie:</b>      | Ionization energy                                 |
| <b>kvisc:</b>   | Kinematic viscosity                               |
| <b>log10ws:</b> | Log10 of Water solubility in mol/l                |
| <b>logp:</b>    | Octanol/Water partition coefficient               |
| <b>mcvol:</b>   | McGowan's characteristic volume                   |
| <b>nfpaf:</b>   | NFPA Fire Rating                                  |
| <b>nfpah:</b>   | NFPA Health Rating                                |
| <b>pc:</b>      | Critical Pressure                                 |
| <b>pt:</b>      | Triple Point Pressure                             |
| <b>pvap:</b>    | Vapor pressure                                    |
| <b>rhoc:</b>    | Critical density                                  |
| <b>rhog:</b>    | Gas Density                                       |
| <b>rhof:</b>    | Liquid Density                                    |
| <b>rinpol:</b>  | Non-polar retention indices                       |
| <b>ripol:</b>   | Polar retention indices                           |
| <b>sfust:</b>   | Entropy of fusion at a given temperature          |
| <b>sl:</b>      | Liquid phase molar entropy at standard conditions |
| <b>speedsl:</b> | Speed of sound in fluid                           |
| <b>srf:</b>     | Surface Tension                                   |
| <b>svapt:</b>   | Entropy of vaporization at a given temperature    |
| <b>tb:</b>      | Normal Boiling Point Temperature                  |
| <b>tc:</b>      | Critical Temperature                              |
| <b>tf:</b>      | Normal melting (fusion) point                     |
| <b>tt:</b>      | Triple Point Temperature                          |
| <b>vc:</b>      | Critical Volume                                   |
| <b>zc:</b>      | Critical Compressibility                          |
| <b>zra:</b>     | Rackett Parameter                                 |

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