

Isothermal Properties for Deuterium oxide

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- **Other Data Available:**
 - [View data in HTML table.](#)
 - [Download data](#) as a tab-delimited text file.
 - Main [NIST Chemistry WebBook](#) page for this species.
 - [Recommended citation](#) for data from this page.
 - [Fluid data for other species](#)

The following adjustments were made to the specified data range:

- The specified increment was adjusted to limit the number of points calculated.

Fluid Data

Isothermal Data for T = 293.15 K

Notice: This plot requires a Java capable browser to be viewed.

Auxiliary Data

Reference States

Internal energy	U = 0 at 273.16 K for saturated liquid.
Entropy	S = 0 at 273.16 K for saturated liquid.

Additional fluid properties

Critical temperature (T_c)	643.89 K
Critical pressure (P_c)	21.6710 MPa
Critical density (D_c)	0.35799 g/ml
Acentric factor	0.364
Normal boiling point	374.563 K
Dipole moment	1.9 Debye

References

Equation of state and auxiliary model

Hill, P.G.; MacMillan, R.D.C.; Lee, V., *A fundamental equation of state for heavy water*, **J. Phys. Chem. Ref. Data**, 1982, 11, 1, 1-14. [\[all data\]](#)

Equation of state

Kestin, J.; Sengers, J.V., *New international formulations for the thermodynamic properties of light and heavy water*, **J. Phys. Chem. Ref. Data**, 1986, 15, 1, 305-321. [\[all data\]](#)

Thermal conductivity and viscosity

International Association for the Properties of Water Steam, *Viscosity of thermal conductivity of heavy water substance* in **Physical Chemistry of Aqueous Systems: Proceedings of the 12th International Conference on the Properties of Water and Steam**, Orlando, FL, 1994, a107-a138. [\[all data\]](#)

Surface tension

International Association for the Properties of Water Steam, *IAPWS release on surface tension of heavy water substance* in **Physical Chemistry of Aqueous Systems: Proceedings of the 12th International Conference on the Properties of Water and Steam**, Orlando, FL, 1994, a103-a106. [\[all data\]](#)

Additional Information

Thermal conductivity

The uncertainty in viscosity is 2% in the liquid below 623 K and in the vapor below 573 K, 5% elsewhere in the liquid and vapor, and 10% in the critical region (623 to 723 K and 21.66 to 50 MPa).

Viscosity

The uncertainty in viscosity is 1% in the liquid below 474 K, 2% in the liquid at higher temperatures and in the vapor, and 5% between 623 and 723 K at pressures between 16 and 50 MPa.

Important Information About This Data

The data above are from the prior version of the NIST Reference Fluid Thermodynamic and Transport Properties Database (REFPROP version 7). We will be updating our site to use the newer version (version 8) of this database in the the next couple of months. Information on REFPROP version 8 can be found [here](#). REFPROP version 8 includes additional data and features not available from this site.

Notes

- Data from NIST Standard Reference Database 69: *NIST Chemistry WebBook*
- The National Institute of Standards and Technology (NIST) uses its best efforts to deliver a high quality copy of the Database and to verify that the data contained therein have been selected on the basis of sound scientific judgment. However, NIST makes no warranties to that effect, and NIST

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