

FIXED POINT PROPERTIES OF H₂O AND D₂O

Temperatures are given on the IPTS-68 scale.

References

1. Haar, L., Gallagher, J. S., and Kell, G. S., *NBS/NRC Steam Tables*, Hemisphere Publishing Corp., New York, 1984.
2. Levelt Sengers, J. M. H., Straub, J., Watanabe, K., and Hill, P. G., Assessment of critical parameter values for H₂O and D₂O, *J. Phys. Chem. Ref. Data*, 14, 193, 1985.
3. Kestin, J. et. al., Thermophysical properties of fluid D₂O, *J. Phys. Chem. Ref. Data*, 13, 601, 1984.
4. Kestin, J. et. al., Thermophysical properties of fluid H₂O, *J. Phys. Chem. Ref. Data*, 13, 175, 1984.
5. Hill, P. G., MacMillan, R. D. C., and Lee, V., A fundamental equation of state for heavy water, *J. Phys. Chem. Ref. Data*, 11, 1, 1982.

	Unit	H ₂ O	D ₂ O
Molar mass	g/mol	18.01528	20.02748
Melting point(101.325 kPa)	°C	0.00	3.82
Boiling point(101.325 kPa)	°C	100.00	101.42
Triple point temperature	°C	0.01	3.82
Triple point pressure	Pa	611.73	661
Triple point density(l)	g/cm ³	0.99978	1.1055
Triple point density(g)	mg/L	4.885	5.75
Critical temperature	°C	373.99	370.74
Critical pressure	MPa	22.064	21.671
Critical density	g/cm ³	0.322	0.356
Critical specific volume	cm ³ /g	3.11	2.81
Maximum density(saturated liquid)	g/cm ³	0.99995	1.1053
Temperature of maximum density	°C	4.0	11.2

THERMAL CONDUCTIVITY OF SATURATED H₂O AND D₂O

This table gives the thermal conductivity λ for water (H₂O or D₂O) in equilibrium with its vapor. Values for the liquid (λ_l) and vapor (λ_v) are listed, as well as the vapor pressure.

References

1. Sengers, J.V. and Watson, J.T.R., Improved international formulations for the viscosity and thermal conductivity of water substance, *J. Phys. Chem. Ref. Data*, 15, 1291, 1986.
2. Matsunaga, N. and Nagashima, A., Transport properties of liquid and gaseous D₂O over a wide range of temperature and pressure, *J. Phys. Chem. Ref. Data*, 12, 933, 1983.

t/°C	H ₂ O			D ₂ O		
	P/kPa	λ_l / (mW/K m)	λ_v / (mW/K m)	P/kPa	λ_l / (mW/K m)	λ_v / (mW/K m)
0	0.6	561.0	16.49			
10	1.2	580.0	17.21	1.0	575	17.0
20	2.3	598.4	17.95	2.0	589	17.8
30	4.2	615.4	18.70	3.7	600	18.5
40	7.4	630.5	19.48	6.5	610	19.3
50	12.3	643.5	20.28	11.1	618	20.2
60	19.9	654.3	21.10	18.2	625	21.0
70	31.2	663.1	21.96	28.8	629	21.9
80	47.4	670.0	22.86	44.2	633	22.8
90	70.1	675.3	23.80	66.1	635	23.8
100	101.3	679.1	24.79	96.2	636	24.8
150	476	682.1	30.77	465	625	30.8
200	1555	663.4	39.10	1546	592	39.0
250	3978	621.4	51.18	3995	541	52.0
300	8593	547.7	71.78	8688	473	75.2
350	16530	447.6	134.59	16820	391	143.0