

Table 2.2 Physical properties of water, H₂O (mol wt = 18.016), at 1 atm*

Solid H₂O = ice (at 0°C)					
Density = 0.915 g cm ⁻³ ; specific volume = 1.093 cm ³ g ⁻¹					
Vapor pressure = 4.579 Torr					
Heat of melting = 333.4 kJ kg ⁻¹ = 6.007 kJ mol ⁻¹					
Absolute molar entropy = 41.0 J K ⁻¹ mol ⁻¹					
Specific heat capacity = 2.113 kJ K ⁻¹ kg ⁻¹					
Molar heat capacity = 38.07 kJ K ⁻¹ mol ⁻¹					
Liquid H₂O					
Temperature (°C)	Density (g cm ⁻³)	Surface tension (mN m ⁻¹)	Vapor pressure (Torr)	Heat of vaporization (kJ kg ⁻¹)	Viscosity (mPa s)
0	0.9999	75.64	4.579	2493	1.7921
20	0.9982	72.75	17.535	2447	1.0050
40	0.9922	69.56	55.324	2402	0.6560
60	0.9832	66.18	149.38	2356	0.4688
80	0.9718	62.61	355.1	2307	0.3565
100	0.9584	58.85	760.00	2257	0.2838
Absolute molar entropy = 63.2 J K ⁻¹ mol ⁻¹ at 0°C = 87.0 J K ⁻¹ mol ⁻¹ at 100°C					
Specific heat capacity = 4.18 kJ K ⁻¹ kg ⁻¹ between 0 and 100°C					
Molar heat capacity = 75.4 kJ K ⁻¹ mol ⁻¹					
Heat of freezing = -333.4 kJ kg ⁻¹ at 0°C					
Gaseous H₂O = steam (at 100°C)					
Density = 5.880 × 10 ⁻⁴ g cm ⁻³ ; specific volume = 1701 cm ³ g ⁻¹					
Absolute molar entropy = 196.2 J K ⁻¹ mol ⁻¹					
Specific heat capacity at constant pressure = 1.874 kJ K ⁻¹ kg ⁻¹					
Molar heat capacity at constant pressure = 33.76 kJ K ⁻¹ mol ⁻¹					
Heat of condensation = -2257 kJ kg ⁻¹ = -40.66 kJ mol ⁻¹					

* Some of the properties listed will be defined and discussed in later chapters.

Reference: Tinoco, I., Sauer, K., Wang, J.C. Physical Chemistry. Prentice Hall, New Jersey. 1995. p.33