

Saturation vapor pressure with respect to ice requires a minor adjustment of the constants in Equation 2.18 as given by the following:

$$e_{is} = (1.0003 + 4.18 \times 10^{-6} P) 6.1115 \text{ EXP } [22.452 T / (272.55 + T)] \quad (2.19)$$

In addition to yielding saturation vapor pressure as a function of ambient temperature, Equations 2.18 and 2.19 also yield actual vapor pressure as a function of dew or frost point temperature.

Total pressure of a gas mixture is equal to the sum of the partial pressures each constituent gas would exert, were it to occupy the same total volume, according to Dalton's law. The first term (in parentheses) in Equations 2.18 and 2.19 is the enhancement factor, and corrects for the slight difference between the ideal behavior of pure water and the behavior of water vapor as a constituent of air. An illustrative curve for water vapor pressure versus temperature for water is shown in Figure 2.1 and for supercooled water and ice in Figure 2.2.

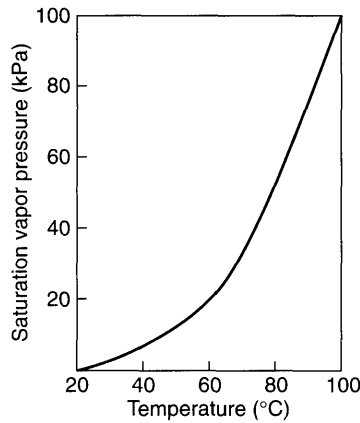


Figure 2.1 Saturation vapor pressure for water.

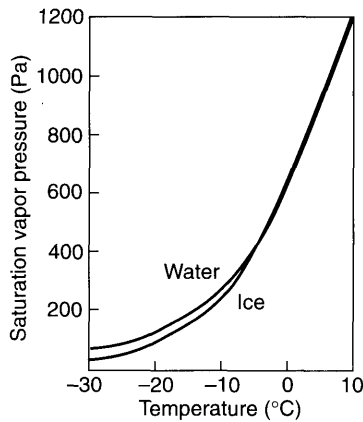


Figure 2.2 Saturation vapor pressure for ice and supercooled water.