Glossary

absolute zero the lowest possible temperature; the temperature at which all molecular motion ceases

Avogadro's number N_{A} , the number of molecules or atoms in one mole of a substance; $N_{\mathrm{A}} = 6.02 \times 10^{23}$ particles/mole

Boltzmann constant k , a physical constant that relates energy to temperature; $k = 1.38 \times 10^{-23}$ J/K

Celsius scale temperature scale in which the freezing point of water is 0°C and the boiling point of water is 100°C

coefficient of linear expansion α, the change in length, per unit length, per 1°C change in temperature; a constant used in the calculation of linear expansion; the coefficient of linear expansion depends on the material and to some degree on the temperature of the material

coefficient of volume expansion β, the change in volume, per unit volume, per 1°C change in temperature

critical point the temperature above which a liquid cannot exist

critical pressure the minimum pressure needed for a liquid to exist at the critical temperature

critical temperature the temperature above which a liquid cannot exist

Dalton's law of partial pressures the physical law that states that the total pressure of a gas is the sum of partial pressures of the component gases

degree Celsius unit on the Celsius temperature scale

degree Fahrenheit unit on the Fahrenheit temperature scale

dew point the temperature at which relative humidity is 100%; the temperature at which water starts to condense out of the air

Fahrenheit scale temperature scale in which the freezing point of water is 32°F and the boiling point of water is 212°F

ideal gas law the physical law that relates the pressure and volume of a gas to the number of gas molecules or number of moles of gas and the temperature of the gas

Kelvin scale temperature scale in which 0 K is the lowest possible temperature, representing absolute zero

mole the quantity of a substance whose mass (in grams) is equal to its molecular mass

partial pressure the pressure a gas would create if it occupied the total volume of space available

percent relative humidity the ratio of vapor density to saturation vapor density

phase diagram a graph of pressure vs. temperature of a particular substance, showing at which pressures and temperatures the three phases of the substance occur

***PV* diagram** a graph of pressure vs. volume

relative humidity the amount of water in the air relative to the maximum amount the air can hold

saturation the condition of 100% relative humidity

sublimation the phase change from solid to gas

temperature the quantity measured by a thermometer

thermal energy $\bar{K}E$, the average translational kinetic energy of a molecule

thermal equilibrium the condition in which heat no longer flows between two objects that are in contact; the two objects have the same temperature

thermal expansion the change in size or volume of an object with change in temperature

thermal stress stress caused by thermal expansion or contraction

triple point the pressure and temperature at which a substance exists in equilibrium as a solid, liquid, and gas

vapor a gas at a temperature below the boiling temperature

vapor pressure the pressure at which a gas coexists with its solid or liquid phase

zeroth law of thermodynamics law that states that if two objects are in thermal equilibrium, and a third object is in thermal equilibrium with one of those objects, it is also in thermal equilibrium with the other object