

Chapter 18 Thermal Properties of Matter

Example 1:

How many molecules are there in 30 liters of gas at 1 atmosphere and 100 °C?

Example 2:

Calculate the volume of 1 mole of an ideal gas at STP.

Example 3:

A 500 liter tank contains helium gas at a STP. What is the mass of the helium in the tank?

Example 4:

Two moles of nitrogen gas are at a pressure of 6 atmospheres and a temperature of 0 °C. If the gas is heated at a constant volume until its temperature doubles, what is its new pressure?

Example 5:

A balloon having a volume of 200 m³ contains helium at a pressure of one atmosphere and at a temperature of 27 °C. It is released and rises to an altitude where the pressure is 0.002 atmospheres and the temperature is - 43 °C. What is the balloon's volume at this altitude?

Example 6:

Find the rms speed of a hydrogen nucleus at a temperature of 20 million °C.

Derivation of the relationship between C_p and C_v

Example 7:

Calculate the change in heat when the temperature of 3 moles of monatomic gas is doubled at constant volume. The gas is initially at STP.

Example 8:

Calculate the change in heat when the temperature of 3 moles of monatomic gas is doubled at a constant pressure. The gas is initially at STP.