PHYS 2303 Homework 1

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Volume 2 Section 1.2 Problem 47

(a) At what temperature do the Fahrenheit and Celsius scales have the same numerical value?

(b) At what temperature do the Fahrenheit and Kelvin scales have the same numerical value?

Volume 2 Section 2.1 Problem 25

A company advertises that it delivers helium at a gauge pressure of 1.72×10^7 Pa in a cylinder of volume 43.8 L. How many balloons can be inflated to a volume of 4.00 L with that amount of helium? Assume the pressure inside the balloons is 1.01×10^5 Pa and the temperature in the cylinder and the balloons is 25.0 °C .

Volume 2 Section 2.2 Problem 43

The product of the pressure and volume of a sample of hydrogen gas at 0.00 °C is 80.0 J.

(a) How many moles of hydrogen are present?

(b) What is the average translational kinetic energy of the hydrogen molecules?

(c) What is the value of the product of pressure and volume at 200 °C?

Volume 2 Section 2.2 Problem 46

The escape velocity of any object from Earth is 11.1 km/s. At what temperature would oxygen molecules (molar mass is equal to 32.0 g/mol) have root-mean-square velocity v_{rms} equal to Earth's escape velocity of 11.1 km/s?