Skill Practice 36

Gases and Moles Practice

Name: _____

Date: _____

Hour: _____

1. Under water where the temperature is 17°C and the pressure is 394 kPa, a diver inhales 2.1 L of air from his SCUBA tank.
   a) How many moles of gas are in his lungs?
   0.343 mol

   b) If the diver swims to the surface without exhaling where the temperature is 32°C and the pressure changes to 100.2 kPa, what will the volume of the air in his lungs be?
   8.68 L

3. On planet X, 2.78 moles of a gas takes up 1.85 L under a pressure of 74.1 kPa and a temperature of 201°C. What is the value of the ideal gas constant (R) on planet X? (include units)

   0.104 kPa-L/(mol-K)

4. At a pressure of 103 kPa and a temperature of 22°C, 52.9 g of a certain gas has a volume of 31.5 L. What is the identity of this gas? (Hint: find the molar mass of the gas and match it with the periodic table.)
   Molar mass = 39.97 g/mol → Argon

5. Some oxygen gas has a volume of 41.0 L under a pressure of 245 kPa and a temperature of 279 K. What is the mass of the gas?

   138.6 g

6. 17.5 mL of oxygen gas were collected at room temperature (22°C) and 100.2 kPa of atmospheric pressure.

   a) How many moles of oxygen gas were produced?
   7.15×10^{-4} mol

   b) What is the molar volume of the oxygen gas at the conditions in the laboratory?
   24.5 L

7. What is the molar volume of a gas at 135 kPa and 45°C?

   19.6 L