Dalton's Law of Partial Pressures

1. 5.0 moles of carbon dioxide gas and 3.0 moles of oxygen gas are exerting a total pressure of 650 kPa. What is the partial pressure of each gas?

2. 1.2×10^{23} molecules of hydrogen gas and 3.0×10^{23} molecules of nitrogen gas are together causing a pressure of 102.6 kPa. What is the partial pressure of each gas?

3. 4.0 moles of carbon dioxide and 10.0 g of hydrogen gas are exerting a total pressure of 910 kPa. What is the partial pressure of hydrogen?

4. 32.0 g of nitrogen and 32.0 g of oxygen are in a 25.0 L container at 0°C. What is the total pressure if the partial pressure of nitrogen is 78.0 kPa. What is the partial pressure of oxygen?

5. If 5.0 g of hydrogen and 16.0 g of oxygen and 160 g of methane are mixed so that the total pressure is 780 kPa, what is the partial pressure of each gas?

6. A gas mixture contains 5.0 moles of nitrogen and some oxygen. If the total pressure is 96.0 kPa and the partial pressure of nitrogen is 60.0 kPa, how many moles of oxygen are present?

7. A tank contains a mixture of gases as follows:
92 g of nitrogen dioxide, 48 g of methane, 64 g of sulfur dioxide, and 64 g of oxygen. Given that the partial pressure of oxygen is 60.0 kPa, find the total pressure of the mixture of gases and the partial pressures of each gas in the tank.

8. A sample of hydrogen gas is collected by water displacement. The container of gas collected has a volume of 645 mL at 25 ^{O}C and a total pressure of 101.5 kPa. How many moles of hydrogen gas are in the sample? (HINT: look up Table of water vapour pressure to determine the pressure of the dry gas and then use PV = nRT)

9. A 249 mL sample of carbon dioxide prepared in the Colonel By Laboratory is collected at 23 ^{O}C by displacement of water. If the total pressure of the sample is 99.8 kPa, what is:
a) the partial pressure of the $CO_{2(g)}$
b) mass of the $CO_{2(g)}$ in the sample?

10. If 0.500 L of an ideal gas is collected over water at 20.0 ^{O}C at an atmospheric pressure of 95.5 kPa, what is the volume of the dry gas at STP?