Chemistry: Assignment 2- Gas Laws Wkst 1 Name:

Boyle's Law problems

1. A gas occupies 12.3 liters at a pressure of 40.0 mm Hg. What is the volume when the pressure is increased to 60.0 mm Hg?

2. If a gas at 25.0 ºC occupies 3.60 liters at a pressure of 1.00 atm, what will be its volume at a pressure of 2.50 atm?

3. To what pressure must a gas be compressed in order to get into a 3.00 cubic foot tank the entire weight of a gas that occupies 400.0 cu. ft. at standard pressure?

4. A gas occupies 1.56 L at 1.00 atm. What will be the volume of this gas if the pressure becomes 3.00 atm?

5. A gas occupies 11.2 liters at 0.860 atm. What is the pressure if the volume becomes 15.0 L?

6. 500.0 mL of a gas is collected at 745.0 mm Hg. What will the volume be at standard pressure?

11. When the pressure on a gas increases, will the volume increase or decrease?

17. A gas occupies 25.3 mL at a pressure of 790.5 mm Hg. Determine the volume if the pressure is reduced to 0.804 atm.

23. You are now wearing scuba gear and swimming under water at a depth of 66.0 ft. You are breathing air at 3.00 atm and your lung volume is 10.0 L. Your scuba gauge indicates that your air supply is low so, to conserve air, you make a terrible and fatal mistake: you hold your breath while you surface. What happens to your lungs? Why?

Charles' Law Questions

32. Calculate the decrease in temperature when 2.00 L at 20.0 ºC is compressed to 1.00 L.

33. 600.0 mL of air is at 20.0 ºC. What is the volume at 60.0 ºC?

47. When the temperature of a gas decreases, does the volume increase or decrease?

48. If the Kelvin temperature of a gas is doubled, the volume of the gas will increase by ____.

52. A balloon has a volume of 2500.0 mL on a day when the temperature is 30.0 ºC. If the temperature at night falls to 10.0 ºC, what will be the volume of the balloon if the pressure remains constant?

53. When 50.0 liters of oxygen at 20.0 ºC is compressed to 5.00 liters, what must the new temperature be to maintain constant pressure?

54. If 15.0 liters of neon at 25.0 ºC is allowed to expand to 45.0 liters, what must the new temperature be to maintain constant pressure?

Combined Gas Law

73. A gas has a volume of 800.0 mL at minus 23.00 ºC and 300.0 torr. What would the volume of the gas be at 227.0 ºC and 600.0 torr of pressure?

74. 500.0 liters of a gas are prepared at 700.0 mm Hg and 200.0 ºC. The gas is placed into a tank under high pressure. When the tank cools to 20.0 ºC, the pressure of the gas is 30.0 atm. What is the volume of the gas?

75. What is the final volume of a 400.0 mL gas sample that is subjected to a temperature change from 22.0 ºC to 30.0 ºC and a pressure change from 760.0 mm Hg to 360.0 mm Hg?

81. A gas sample occupies 3.25 liters at 24.5 ºC and 1825 mm Hg. Determine the temperature at which the gas will occupy 4250 mL at 1.50 atm.

86. If the absolute temperature of a given quantity of gas is doubled and the pressure tripled, what happens to the volume of the gas?

87. 73.0 mL of nitrogen at STP is heated to 80.0 ºC and the volume increase to 4.53 L. What is the new pressure?

88. 500.0 mL of a gas was collected at 20.0 ºC and 720.0 mm Hg. What is its volume at STP?