*For each problem below, give the equation needed and show what is given (V1, P1, etc.). Remember that “Torr” = mm Hg.*

V2 = P1V1/P2

P1V1 = P2V2

1. What volume will 50.0 ml of a gas at 96.7 kPa occupy if the pressure is increased to 101.3 kPa?

2. A gas occupies 250. ml when the barometer reads 96.0 kPa. How many ml will it occupy when the barometer reads 98.7 kPa?

3. Find the volume of a gas at standard pressure if its volume at 104 kPa is 80.0 ml?

4. Find the volume of a gas which occupies 200. ml at 2.60 atm when it is at standard pressure.

5. Correct 36.0 L of a gas at 0.650 atm to standard pressure.

6. Correct 232 mL of gas at 1.75 atm to 7.00 atm.

7. At 0.750 atm, the volume of a gas is 300. ml. If the temperature remains constant and the pressure is changed to 456 Torrs, what is the new volume of the gas?

8. If the volume of a gas, at constant temperature, changes from 200. ml to 500. ml, the pressure on the gas must have changed from 53.3 kPa to \_\_\_\_\_.

ANSWER KEY

V2 = P1V1/P2

P1V1 = P2V2

1. What volume (V2) will 50.0 ml (V1) of a gas at 96.7 kPa (P1) occupy if the pressure is increased to 101.3 kPa (P2)?

V2 = 50.0 ml x (96.7 kPa/101.3 kPa) = 47.7 ml

2. A gas occupies 250. ml (V1) when the barometer reads 96.0 kPa (P1). How many ml (V2) will it occupy when the barometer reads 98.7 kPa (P2)?

V2 = 250. ml x (96 kPa /98.7 kPa) = 243 ml

3. Find the volume (V2) of a gas at standard pressure (P2) if its volume at 104 kPa (P1) is 80.0 ml (V1)?

V2 = 80.0 ml x (104 kPa /101.3 kPa) = 82.1 ml

4. Find the volume (V2) of a gas which occupies 200. ml (V1) at 2.60 atm (P1) when it is at standard pressure (P2).

V2 = 200. ml x (2.60 atm/1 atm) = 520. ml

5. Correct 36.0 L (V1) of a gas at 0.650 atm (P1) to standard pressure (P2).

V2 = 36.0 L x (0.650 atm/1 atm) = 23.4 L

6. Correct 232 ml (V1) of gas at 1.75 atm (P1) to 7.00 atm (P2).

V2 = 232 ml x (1.75 atm/7.00 atm) = 58.0 ml

7. At 0.750 atm (P1), the volume of a gas is 300. ml (V1). If the temperature remains constant and the pressure is changed to 456 Torrs (P2), what is the new volume of the gas (V2)?

760 mm Hg = 1 atm

760 mm Hg / 1 atm

V2 = 300. ml x (570. mm Hg/456 mm Hg) = 375 ml

1 atm/760 mm Hg

V2 = 300. ml x (0.750 atm/ 0.600 atm) = 375 ml

8. If the volume of a gas, at constant temperature, changes from 200. ml (V1) to 500. ml (V2), the pressure on the gas must have changed from 53.3 kPa (P1) to \_\_\_\_\_.

P2 = P1V1 / V2 P2 = 53.3 kPa x (200ml/500ml) = 21.3 kPa