AP Worksheet 3b (Gas Laws)

For numbers 1 through 3 the temperature and the amount of gas are both constant.
1. Write a mathematical equation expressing the relationship between pressure and volume.
2. Calculate the new pressure if a 2.45 L sample of a gas at a pressure of 1.01 atm is contracted to a volume of 2.29 L.
3. Calculate the new volume if 13.3 L of a gas initially at a pressure of 2.51 atm is subjected to an *increase* in pressure equivalent to 65.0 mmHg.

For numbers 4 through 6 the pressure and the amount of gas are both constant.
4. Write a mathematical equation expressing the relationship.
5. Calculate the volume of a particular gas if 1.23 L of it, initially at a temperature of 32.0 °C is subjected to a *drop in* temperature of 19.0 °C.
6. Calculate the volume of a gas if a 12.78 L sample of it, initially at a temperature of -50.00 °C is heated to a temperature of 28.00 °C.

For numbers 7 and 8, assume the gas behaves ideally.
7. A sample of a group 1 bromide weighing 2.000 g was converted to a gas at 504.0 °C and 1.000 atm of pressure. The resulting vapor occupies a volume of 1238 mL. Identify the group 1 metal present in the compound.
8. What volume does 1.24 g of fluorine gas occupy under conditions of 5.20 °C and 2.04 atm?

For numbers 9 and 10, Standard Temperature and Pressure (STP) is 0 °C and 1.00 atm.
9. *The density of oxygen is 1.43 g/L at STP. Determine the density at 17 °C and 800. torr.*
10. Determine the volume occupied by 4.0 g of chlorine gas at STP.

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