Proportional Reasoning with Gases

CλeMis+ry: http://genest.weebly.com

Stop in for help every day at lunch and Tues, Wed., &Thurs after school!

After-hours question? Email me at home:

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Name_____

Period_____

1. What happens to pressure in a sample of gas if you make the new volume triple the original and keep temperature at 310K the whole time?

2. What happens to temperature if you make the new volume ¼ of the original and the new pressure 1/3 of the original?

3. 300. L of nitrogen gas is measured at the standard pressure. What volume will the gas occupy at a pressure of 690 mm Hg?

4. A 71.6-mg sample of pentothenic acid (a vitamin B) gives off 3.84 L of nitrogen gas at 23 °C and 785 mmHg. What is the volume of nitrogen at STP?

5. A bottle of nitrogen was collected at 0°C. Assuming the pressure remains constant at what temperature would the volume be triple?

6. A 38.08 g sample of nitrogen is sealed in a 7.00L container and at a temperature of 327°C. What is the pressure of the gas?

7. Calcium carbide reacts with water to produce acetylene gas, C_2H_2.

$$CaC_2(s) + 2H_2O(l) \rightarrow Ca(OH)_2(aq) + C_2H_2(g)$$

Calculate the volume (in liters) of acetylene produced at 26 °C and 684 mmHg when 35.6 grams of water react with plenty of CaC_2.

8. Magnesium burns in air to produce magnesium oxide, MgO, and magnesium nitride, Mg_3N_2. Magnesium nitride reacts with water to give ammonia.

$$Mg_3N_2(s) + 6H_2O(l) \rightarrow 3Mg(OH)_2(s) + 2NH_3(g)$$

What volume of ammonia (NH_3) gas at 24 °C and 753 mmHg will be produced from 4.56 g of magnesium nitride?

9. How many moles of hydrochloric acid must react with excess calcium carbonate to form 18.0 L of CO_2 at STP?

$CaCO_{3(s)} + 2HCl_{(aq)} \rightarrow H_2O_{(l)} + CO_{2(g)} + CaCl_{2(aq)}$

10. How many liters of ozone can be destroyed at 220. K and 5.00 kPa if 250. g of chlorine reacts with ozone according to the following equation?

$Cl_{2(g)} + 2O_{3(g)} \rightarrow 2ClO_{(g)} + 2O_{2(g)}$