NAME: **HONORS CHEMISTRY**

SECTION: Pairs/Check: Gas Stoichiometry

Molar volume of a gas at STP:

As with any stoichiometry problem, make sure you have a balanced equation!

Examples

* C3H8 + 5 O2 🡪 3 CO2 + 4 H2O
* If 25 liters of oxygen are consumed in the reaction above at STP, how many liters of carbon dioxide are produced?

The Universal Gas Constant

R = $8.314 \frac{L kPa}{mol K}$

R = 0.0821 $\frac{L atm}{mol K}$

What if you are not at STP?

* Mole-mole conversions aren’t affected by pressure or temperature
* Use the ideal gas law or combined gas law as well as reaction stoichiometry
* What volume of chlorine gas measured at 18.5oC and 98.0 kPa can be produced by the electrolysis of 62.3 g of NaCl to give sodium metal and chlorine gas?

Problems for you to try…

Directions:

1. Both partners complete both problems. Use factor label, show all your work on the paper, and record your answer with the correct number of significant figures and an appropriate unit.
2. After each problem, discuss the solution to the problem with your partner. If both partners agree on the answer, both students initial the answers. If an agreement can’t be reached, both partners raise their hands to get the teacher’s attention.
3. Complete the self evaluation.
4. How many liters of ozone can be destroyed at 230. K and 7.00 kPa if 125 g of chlorine gas react with it according to the following equation?

 Cl2(g) + 2 O3(g) 🡪 2 ClO(g) + 2 O2(g)

1. How many liters of hydrogen gas can be collected at 220. K and 97.3 kPa if 23.0 g of zinc metal react with excess hydrochloric acid according to the following equation?

 Zn(s) + 2 HCl(aq) 🡪 ZnCl2(aq) + H2(g)

1. How many grams of calcium carbonate must react with excess hydrochloric acid to form 47 L of carbon dioxide at 32.0oC and 1.35 atm?

 CaCO3(s) + 2 HCl(aq) 🡪 H2O(l) + CO2(g) + CaCl2(aq)

1. If 7.20 L of sulfur dioxide gas are collected at 112.1 kPa and 24.3oC according to the reaction shown below, how many grams of iron(III) oxide will also be produced?

 4 FeS(s) + 7O2(g) 🡪 2 Fe2O3(s) + 4 SO2(g)

The purpose of this assignment was to: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| Did I: | Circle the appropriate response: |
| Clearly identify the errors? | Always Sometimes Rarely |
| Listen while my partner explained? | Always Sometimes Rarely |
| Give my partner positive support? | Always Sometimes Rarely |
| Stay on task during the assignment? | Always Sometimes Rarely |
| Use encouraging and polite words? | Always Sometimes Rarely |
| Record my work on the paper? | Always Sometimes Rarely |
| Demonstrate an understanding of the material? | Yes No |

Comments: