**Chem 1311 Unit 1 Test Prep**

Label each change as physical or chemical:

\_\_\_\_\_\_ Rusting of iron

\_\_\_\_\_\_ Sublimation of dry ice

\_\_\_\_\_\_ Burning a piece of paper

\_\_\_\_\_\_ Filling a balloon with warm air

\_\_\_\_\_\_ Baking a cake

\_\_\_\_\_\_ A rotting banana

Complete each metric conversion using appropriate significant figures:

1.234 kg 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_ g

0.0457 L 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_ mL

234 cm 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_ m

12.5 m/s 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_ km/min

A 125mL flask is sealed with a cork to prevent any gas from escaping the container. It holds ethanol, a gas with a density of 0.790g/mL when at room temperature. What is the mass of the gas, in grams, inside the flask?

A particular isotope of phosphorous contains 17 neutrons and a charge of 3-. What is the isotope’s mass number?

Calculate the average atomic weight of silicon.

28Si 27.98 at 95.33% abundance

29Si 28.98 at 1.780% abundance

30Si 29.96 at 2.890% abundance

Fill in the blanks:

|  |  |  |
| --- | --- | --- |
| **Name** | **Formula** | **Ionic, covalent, or acid?** |
| Nitric acid |  |  |
|  | NH4OH |  |
| Bromine trihydride |  |  |
| Nickel (II) oxide |  |  |
|  | AgCl2 |  |
| Hydrofluoric acid |  |  |
|  | SiCl4 |  |
|  | H2(SO4) |  |

How many formula units are in 36.7 grams of potassium chloride?

How many moles of nitric oxide are in 4.55x1023 atoms?

What is the percent mass of oxygen in iron (II) sulfate?

A compound is found to contain 23.3% magnesium, 30.7% sulfur, and 46.0% oxygen. What is the empirical formula of this compound?

Balance the equation and use it to solve questions 1-4:

\_\_\_\_\_ Na2S + \_\_\_\_\_ HCl 🡪 \_\_\_\_\_ NaCl + \_\_\_\_\_ H2S

1. What kind of reaction is this?
2. 13.4 grams of sodium sulfide reacts with 23.8 grams of hydrochloric acid to produce sodium chloride and sulfide acid. Which substance is the limiting reactant?
3. What is the combined mass of product in grams that is produced based on the limiting reactant?
4. If 25.0 grams of sodium chloride is expected to be produced, but a student spills 0.05 grams and that was the only reported error, what is the percent yield?

How many moles of silver chloride are produced when 45.62 grams of silver reacts with 23.40 grams of chloride?

A combination reaction between magnesium and oxygen produces 15.3 grams of magnesium oxide. How many grams of magnesium did the reaction require? (\*hint- write the balanced chemical equation\*)

Propane (C3H8) reacts with oxygen to produce carbon dioxide and water. If 62.49 grams of propane and 32.04 grams of oxygen are supplied, how many grams of carbon dioxide is produced? (\*hint- write the balanced chemical equation\*)