NAME: **HONORS CHEMISTRY**

SECTION: Stoichiometry Calculations Using Density

Answer the following questions. Show all your work in the space provided. Use factor label and report your answer with the appropriate unit and correct number of significant figures.

Density formula:

1. The air bag in a car needs a minimum of 67.0 L of nitrogen to inflate properly. How many grams of sodium azide must be placed in the air-bag ignitor to generate this amount of gas? Nitrogen gas has a density of 1.170 g/L at 22oC. 2 NaN3(s) → 2Na(s) + 3 N2(g)
2. How many liters of NO gas can be produced if 120. g of copper metal react with excess nitric acid, HNO3, according to the equation below? The density of NO gas is 1.310 g/L at these conditions.

 3 Cu(s) + 8HNO3(aq) → 3 Cu(NO3)2 (aq) + 2NO(g) + 4 H2O(ℓ)

1. Limestone (CaCO3) will react with most acids to form a calcium salt, water, and carbon dioxide. How many liters of carbon dioxide gas will be released if 7.85 g of calcium carbonate react with phosphoric acid according to the following equation? The density of CO2 is 1.997 g/L.

 3CaCO3(s) + 2 H3PO4(aq) → Ca3(PO4)2(s) + 3 H2O(ℓ) + 3 CO2(g)

Answers

1. 121g
2. 28.8 L
3. 1.72 L