

~~Chapter 10 Test~~ Review Sheet

Part 1: Molar Mass – Determine the molar mass for the following compounds. Round to the nearest hundredths and remember your units!

a) ZnCl_2

$$\begin{aligned} \text{Zn: } & 1(65.39) = 65.39 \\ \text{Cl: } & 2(35.453) = 70.906 \\ & \underline{136.296} \end{aligned}$$

$$\boxed{136.30 \text{ g/mol}}$$

b) $\text{Fe}(\text{NO}_3)_3$

$$\begin{aligned} \text{Fe: } & 1(55.845) = 55.845 \\ \text{N: } & 3(14.007) = 42.021 \\ \text{O: } & 9(15.999) = 143.991 \\ & \underline{241.857} \end{aligned}$$

$$\boxed{241.86 \text{ g/mol}}$$

Part 2: Conversions between Mass, Volume, & Representative Particles – Complete the following questions/conversions. SHOW ALL WORK. Do you forget correct units. Round to the nearest hundredths.

- One mole of any element/compound/ion always equals 6.02×10^{23} representative units.
- One mole of any gas at STP is equal to 22.4 liters.
- How many molecules are in 8.17 L of HCl at STP?

$$8.17 \text{ L HCl} \times \frac{1 \text{ mol}}{22.4 \text{ L}} \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol}} = 2.1956875 \times 10^{23}$$

$$\boxed{2.20 \times 10^{23} \text{ molecules HCl}}$$

4. How many formula units are in 94 g of NaCl?

$$94 \text{ g NaCl} \times \frac{1 \text{ mol}}{58.443 \text{ g}} \times \frac{6.02 \times 10^{23} \text{ fu}}{1 \text{ mol}} = 9.682596718 \times 10^{23}$$

$$\boxed{9.68 \times 10^{23} \text{ fu NaCl}}$$

5. What is the volume of 325 grams of Krypton at STP?

$$325 \text{ g Kr} \times \frac{1 \text{ mol}}{83.80 \text{ g}} \times \frac{22.4 \text{ L}}{1 \text{ mol}} = 86.87350835$$

$$\boxed{86.87 \text{ L Kr}}$$

6. How many atoms are in 5.48 L of CO_2 at STP?

$$5.48 \text{ L} \times \frac{1 \text{ mol}}{22.4 \text{ L}} \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol}} \times \frac{3 \text{ atoms}}{1 \text{ molecule}} = 4.41825 \times 10^{23}$$

$$\boxed{4.42 \times 10^{23} \text{ atoms in CO}_2}$$

7. How many sulfur atoms are in 645 grams of S_4N_2 ?

$$645g S_4N_2 \times \frac{1 \text{ mol}}{156.274g} \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol}} \times \frac{4 \text{ S atoms}}{1 \text{ molecule}} = 9.938697416 \times 10^{24}$$

$$9.94 \times 10^{24} \text{ S atoms } S_4N_2$$

Part 3: Percent Composition – Determine the percent composition of each element in the following compounds. Round your answer to the nearest tenth of a decimal place. SHOW ALL WORK.

1. Determine the percent composition of lead (Pb) in $PbSO_4$.

$$\frac{207.2}{303.261} \times 100 = 68.32398495$$

$$68.3\% \text{ Pb}$$

2. Find the percent composition of each element in the compound containing 13.13 grams potassium, 8.73 grams chromium, and 10.72 grams oxygen.

$$K: \frac{13.13}{32.58} \times 100$$

$$40.30079804$$

$$40.3\%$$

$$Cr: \frac{8.73}{32.58} \times 100$$

$$26.79558011$$

$$26.8\%$$

$$O: \frac{10.72}{32.58} \times 100$$

$$32.90362185$$

$$32.9\%$$

3. Calculate the mass of hydrogen in 112.4 g of propane (C_3H_8). (HINT: Using percent composition as a conversion factor).

$$\frac{8.0632g}{44.0962g} \times 112.4g = 20.55287485$$

$$20.6g \text{ H}$$

Part 4: Empirical vs Molecular Formula

1. Butane is a hydrocarbon that is a good source of energy. The formula can be written as C_4H_{10} or C_2H_5 . Which formula is the empirical formula? Which is the molecular formula?

C_4H_{10} = molecular

C_2H_5 = empirical

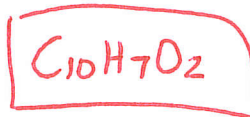
2. A compound contains 75.46% carbon, 4.43% hydrogen, and 20.11% oxygen by mass. It has a molar weight of 318.31 g/mol.

o The empirical formula of the compound is _____.

$$C: 75.46g \times \frac{1\text{mol}}{12.011g} = \frac{6.282574307}{1.257} = 5 \times 2 = 10$$

$$H: 4.43g \times \frac{1\text{mol}}{1.0079g} = \frac{4.395277309}{1.257} = 3.5 \times 2 = 7$$

$$O: 20.11g \times \frac{1\text{mol}}{15.999g} = \frac{1.25695356}{1.257} = 1 \times 2 = 2$$



o The molecular formula of this compound is $\boxed{C_{20}H_{14}O_4}$ _____.

$$\frac{318.31\text{g/mol}}{159.1633\text{g/mol}} = 2$$

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

In the second section, the author outlines the various methods used to collect and analyze the data. This includes both primary and secondary data collection techniques. The primary data was gathered through direct observation and interviews, while secondary data was obtained from existing reports and databases.

The third section details the statistical analysis performed on the collected data. Various statistical tests were used to determine the significance of the findings. The results indicate that there is a strong correlation between the variables being studied, which supports the initial hypothesis.

Finally, the document concludes with a summary of the key findings and their implications. It suggests that the current trends are likely to continue unless there is a significant change in the underlying factors. Further research is recommended to explore these findings in greater depth.

The data shows a clear upward trend in the number of transactions over the period studied. This is consistent with the overall growth of the market. The analysis also reveals that the majority of transactions are concentrated in the first half of the year.

It is important to note that the sample size was limited to a specific geographic area. Therefore, the results may not be generalizable to other regions. Future studies should consider a more diverse sample to improve the validity of the findings.