

Name _____

AP Chemistry

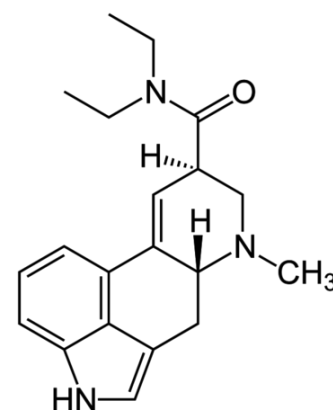
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Chapter 3 Practice Problems Homework

1. There are two naturally occurring isotopes of Gallium. One isotope, gallium-69, has a mass of 68.926 amu and an abundance of 60.108%. Calculate the **mass and name** of the other stable isotope of gallium.

2. A sample of xenon fluoride contains molecules with the general formula XeF_n , where n is some whole number. If 9.03×10^{20} molecules of XeF_n weigh 0.368 g, determine the formula of the sample.

3. D-lysergic acid diethylamide, (LSD) has a chemical formula of: $\text{C}_{20}\text{H}_{25}\text{N}_3\text{O}$.
a. Calculate the molar mass of LSD. Use the full atomic weight as it is listed on your periodic table.



b. Calculate the percent composition of the elements in LSD.

c. Determine the mass of each element in a 297 milligram sample of LSD.

d. In the 1960's a standard dose of LSD contained 270 micrograms of LSD. How many molecules of LSD are there in this size dose?

e. What is the mass of 1 molecule of LSD?

4. A compound containing the elements C, H, N and O is analyzed. When a 2.1106 g sample is burned in excess oxygen, 3.2017 g of $\text{CO}_2(\text{g})$ is formed. The combustion analysis also showed that the sample contained 0.1710 g of hydrogen.

(i) Determine the mass, in grams, of C in the 2.1106 g sample of the compound.

(ii) When the compound is analyzed for N content only, the mass percent of N is found to be 32.16%. Determine the mass, in grams of N in the original 2.1106 g sample of the compound.

(iii) Determine the mass, in grams, of oxygen in the original 2.1106 g sample of the compound.

(iv) Determine the empirical formula of the compound.

(v) The molecular mass of the compound is 174.2 g/mol. Determine the molecular formula of the compound.

5. Nitrogen gas reacts with hydrogen gas to form gaseous ammonia.

a. Write a balanced chemical equation for this reaction.

b. If 65.0 grams of nitrogen react with 10.0 grams of hydrogen gas, what is your limiting reactant. Justify your answer by showing your work or reasoning.

c. How many grams of the excess reagent will be left over once the reaction in part B has been carried out?

d. If in using the above amounts from part B, what is your theoretical yield?

e. If in using the above amounts from part B you produce 32.0 grams of ammonia, what is your percent yield?