

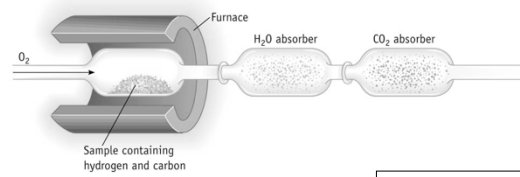
Combustion Analysis

for the determination of the empirical formula of an organic compound

Chapter 3

Combustion Analysis

- + The empirical formula for a compound can be determined by burning it and analyzing the products.



Combustion Analysis Example

- + A sample of an unknown hydrocarbon is burned completely in oxygen to give 1.993 g of carbon dioxide and 0.9519 g of water.
- + What is the empirical formula of the compound?

Combustion Analysis Example

Caproic acid, the compound responsible for the unpleasant aroma of dirty socks, contains only C, H, and O.

When a 0.450-g sample of the compound is burned in oxygen, 1.023 g of CO_2 and 0.418 g of H_2O are collected.

What is the empirical formula of the compound?

Combustion Analysis Example (continued):

1. Consider the reaction occurring:
2. Calculate the moles of C in the CO_2 :
3. Calculate the moles of H in the H_2O :
7. Calculate the mass of O in the compound:
8. Calculate the moles of each element in the compound and their ratios to find the empirical formula: