

## From Analysis → Empirical Formula → Chemical Formula Problem

### Question:

Compounds containing Carbon-Hydrogen-Oxygen can be analysed by burning a sample of the compound in the presence of excess oxygen gas. As a result of the combustion of the compound, all of the carbon in the compound is converted to carbon dioxide gas and all of the hydrogen in the compound is converted to water vapour.

(a) Combustion of 0.4720 g of the compound produced 0.96502 g  $\text{CO}_2$  and 0.29627 g  $\text{H}_2\text{O}$ . What is the empirical formula of the compound?

[Hint: Combustion involves  $\text{O}_2$  as a reactant. The oxygen in  $\text{CO}_2$  and  $\text{H}_2\text{O}$  contains oxygen from the sample and the oxygen from the air. You need to subtract off the oxygen from the air.]

- $\text{C}_3\text{H}_6\text{O}$
- $\text{C}_2\text{H}_3\text{O}$
- $\text{C}_2\text{H}_6\text{O}$

(b) The molar mass of the compound is 172.18 g/mole. What is the chemical formula of the compound?

- $\text{C}_6\text{H}_{12}\text{O}_2$
- $\text{C}_4\text{H}_{12}\text{O}_2$
- $\text{C}_8\text{H}_{12}\text{O}_4$