

Empirical Formula Problems – Set I

1. Determine the empirical formula of a compound consisting of :

(a) 55.3%K, 14.6%P, and 30.1% O. (K_3PO_4)

(c) 52.14%C, 13.13%H, and 34.73% O. (C_2H_6O)

(b) 47.3% Cu and 52.7% Cl. ($CuCl_2$)

(d) 40.0%C, 6.73%H and 53.3% O . (CH_2O)

2. In vanadium oxide, the mole ratio is calculated to be: 2.50 mol O/1 mol V. What is the simplest formula of vanadium oxide ? (V_2O_5)

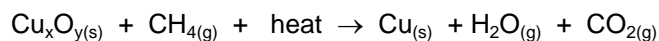
3. Some phosphorus is heated in air to produced phosphorus oxide. The following data was collected:

mass of crucible (reaction vessel)	25.34 g
mass of crucible + phosphorus	27.19 g
mass of crucible + phosphorus oxide	29.58 g

(a) Determine the empirical formula of phosphorus oxide. (P_2O_5)

4. Phosphorus forms two different compounds with chlorine. One compound contains 22.5 % P by mass, and the other contains 14.87 % P by mass. Determine the empirical formulas of the two compounds. (PCl_3 ; PCl_5)

5. An ace chemistry student carries out the following reaction in an attempt to determine the empirical formula of a copper oxide:



Mass of empty test tube	24.25 g
Mass of empty test tube + copper oxide	26.26g
Mass of copper oxide	
Mass of test tube + solid copper(after heating)	25.85 g
Mass of copper (in copper oxide)	
Mass of oxygen (in copper oxide)	

Complete the above data table and determine the empirical formula of copper oxide.

6. An ace chemistry student heats a piece of iron(Fe) metal in a crucible. The reaction is: $\text{Fe}(\text{s}) + \text{O}_2(\text{g}) \rightarrow \text{Fe}_x\text{O}_y(\text{s})$.

Complete the data below. Determine the empirical formula of iron oxide. Show all your work.

mass of crucible	27.50 g
mass of crucible + Fe	28.62 g
mass of Fe	
mass of crucible + iron oxide	29.10 g
mass of iron oxide	
moles of Fe	
mass of oxygen	
moles of oxygen	