Chem 11 - % Composition and Empirical Formulas

(1)

Element	mass/100g	mol	mol ratio	Simplest Ratio
C	50.5 g	4.21 mol	1.33	4
H	5.26 g	5.26 mol	1.66	5
N	44.2 g	3.16 mol	1	3

$C_4H_5N_3$

(2)

Element	mass/100g	mol.	mol. ratio	simplest ratio
Na	21.9 g	0.952	1	1
C	45.7 g	3.81	4	4
H	1.9 g	1.9	2	2
O	30.5 g	1.91	2	2

$NaC_4H_2O_2$

(3)

Element	Mass/100g	mol	mol. ratio	simplest ratio
Fe	77.7 g	1.39	1	1
O	22.3 g	1.39	1	1

FeO

(4) 15.0 kg × 0.72 = 10.8 kg Pb fr. Galena ore

(5) 250.0 g × 0.70 = 175 g Ag_2S

Find % comp of silver in Ag_2S: $\frac{2 \times 107.9}{247.9} = \frac{215.8 \text{ g/mol}}{247.9 \text{ g/mol}} = 0.871$

$= 87.1\%$ Ag

$0.871 \times 175 \text{ g } Ag_2S =$ 152 g Ag

(6) Molar mass P_4O_6 = 220 g/mol

% comp. O = $\frac{96 \text{ g/mol}}{220 \text{ g/mol}}$ = 0.436 = 43.6% Oxygen.

$0.436 \times 6.0\text{g} =$ **2.6 g oxygen**

(7)*

ELEMENT	MASS/100g	MOLES	MOLE RATIO	SIMPLEST RATIO
C	49.46 g	4.122 mol	4	4
H	5.15 g	5.15 mol	5	5
N	28.89 g	2.064 mol	2	2
O	16.51 g	1.032 mol	1	1

1st step:
C = 74.3 mg → 49.46 % C
H = 7.73 mg → 5.15 % H
N = 43.4 mg → 28.89 % N
O = 24.8 mg → 16.51 % O
150.23 mg

$C_4H_5N_2O$

(8)

ELEMENT	Mass/100g	mol.	mol. ratio		simplest ratio.
C	60.0 g	5	2.27	× 4	9
H	4.48 g	4.48	2.04		8
O	35.2 g	2.2	1		4

$C_9H_8O_4$

(9)

ELEMENT	mass/100g	mol.	mol ratio	simplest ratio
C	37.5	3.13	2	4
H	3.15	3.15	2	4
N	21.87	1.56	1	2
O	37.47	2.34	1.5	3

$C_4H_4N_2O_3$