

Percent Composition and Empirical Formula

I (1) Ca: $\frac{40.1}{72.1} = \underline{55.6\%}$

O₂: $\frac{32}{72.1} = \underline{44.4\%}$

(2) Li: $\frac{13.88}{93.98} = \underline{14.8\%}$

S: $\frac{32.1}{93.98} = \underline{34.2\%}$

O: $\frac{48}{93.98} = \underline{51.1\%}$

(3) N: $\frac{28}{132.09} = \underline{21.2\%}$

H: $\frac{9.09}{132.09} = \underline{6.9\%}$

P: $\frac{31}{132.09} = \underline{23.5\%}$

O: $\frac{64}{132.09} = \underline{48.5\%}$

(4) P: $\frac{31}{137.5} = \underline{22.5\%}$

Cl: $\frac{106.5}{137.5} = \underline{77.5\%}$

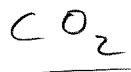
(5) C_o: $\frac{58.9}{182.9} = \underline{32.2\%}$

N: $\frac{28}{182.9} = \underline{15.3\%}$

O: $\frac{96}{182.9} = \underline{52.5\%}$

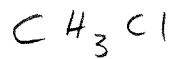
II (1) O: $\frac{16}{16} = 1$ $\frac{1}{.5} = 2$

C: $\frac{6}{12} = 0.5$ $\frac{.5}{.5} = 1$



(2) Cl: $\frac{7.1}{35.5} = 0.2$ $\frac{.2}{.2} = 1$

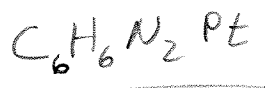
C: $\frac{2.4}{12} = 0.2$ $\frac{.2}{.2} = 1$



H: $\frac{0.603}{1.01} = 0.6$ $\frac{.6}{.2} = 3$

(3) Pt: $\frac{65.02}{195.1} = 0.33$ $\frac{.33}{.33} = 1$

N: $\frac{9.34}{14} = 0.67$ $\frac{.67}{.33} = 2$



H: $\frac{2.02}{1.01} = 2$ $\frac{2}{.33} = 6$

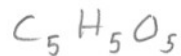
C: $\frac{23.63}{12} = 1.97$ $\frac{1.97}{.33} = 6$

III ① $CHO = 12 + 1.01 + 16 = 29.01 \text{ g}$

$$\frac{135}{29.01} = 4.65$$

$$\frac{155}{29.01} = 5.34$$

So the molar mass is probably 5x the formula



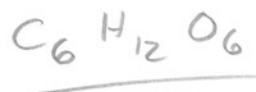
② C: $\frac{40}{12} = 3.33$ $\frac{3.33}{3.33} = 1$

H: $\frac{6.713}{1.01} = 6.65$ $\frac{6.65}{3.33} = 2$ CH_2O

O: $\frac{53.28}{16} = 3.33$ $\frac{3.33}{3.33} = 1$

$$CH_2O = 12 + 2 \cdot 0.2 + 16 = 30.02 \text{ g}$$

$$\frac{180 \text{ g/mol}}{30.02 \text{ g}} = 6$$



Formula of Hydrate	Molar Mass of Hydrate	Formula of Anhydrate	Molar Mass of Anhydrate	% Water
$MgSO_4 \cdot 7H_2O$	246.54 g	$MgSO_4$	120.4 g	51.2%
$Na_2S_2O_3 \cdot 5H_2O$	248.2 g	$Na_2S_2O_3$	158.2 g	36.3%
$KNaC_4H_4O_6 \cdot 4H_2O$	282.14 g	$KNaC_4H_4O_6$	210.14 g	25.5%