

Formula Calculations Review

I. Molar Mass Calculations

- a. TaC *193 g/mol*
- b. AlN *41 g/mol*
- c. P₄S₃ *220 g/mol*
- d. Ca₃(PO₄)₂ *310 g/mol*
- e. Ba(ClO)₂ *239 g/mol*
- f. CH₃OH *32 g/mol*
- g. CuCl₂ *134 g/mol*
- h. Hg(CH₃COO)₂ *319 g/mol*
- i. NiF₂ *97 g/mol*
- j. K₂SO₄ *174 g/mol*
- k. MgSO₄ X 5H₂O *210 g/mol*

II. Measurement Conversions

- a. 0.943 moles of H₂O to atoms *5.68 X 10²³ atoms*
- b. 7.74 X 10²⁵ atoms of H₂ to moles *128.57 mol ~129 mol*
- c. 91.0 grams of NH₄ClO₃ to moles *0.901 mol*
- d. 0.638 moles of Ba(CN)₂ to grams *120.58 g ~121 g*
- e. 50.4 grams of CaBr₂ to moles *0.252 mol*
- f. 1.26 moles of NbI₅ to grams *917.28 g ~917 g*
- g. 86.2 grams of C₂H₄ to moles *3.08 mol*
- h. 12.04 X 10²⁵ atoms of Cu to grams
12800 gram ~1.28 X 10⁴ g

III. Percent Composition

Calculate the Percent Composition of the elements in the following compounds:

- a. Al₂S₃ *Al: 36% S: 65%*
- b. NiI₂ *Ni: 18.84% I: 81.15%*
- c. Ca(CN)₂ *Ca: 43.48% C: 26.09% N: 30.43%*
- d. Cu(ClO₄)₂ *Cu: 24.43% Cl: 26.72% O: 48.85%*
- e. Bi(OH)₂ *Bi: 86% O: 13.17% H: 0.82%*
- f. BaCl₂ *Ba: 66.18% Cl: 33.82%*

g. $\text{Tl}(\text{NO}_3)_3$ Tl: 52.31% N: 10.77% O: 36.92%

IV. What is the percentage of water in the formula $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$?

45.57% H_2O

V. Formulas

Find the empirical formula of the following:

- a. 1.67 g of Ce; 4.54 g of I CeI_3
b. 68.8 g of C; 4.95 g of H; 26.2 g of O $\text{C}_4\text{H}_3\text{O}$
c. 60% of C; 4.48 % of H; 35.5% of O $\text{C}_2\text{H}_2\text{O}$
d. 32.8% of Cr; 67.2% of Cl CrCl_3

Find the molecular formula of the following:

A compound is composed of 27.27% carbon and 72.73% oxygen. The molar mass of the compound is 132.0 g/mol. Determine the empirical and molecular formulas for the compound.

$\text{CO}_2 \sim \text{C}_3\text{O}_6$