

Percentage Composition: Review Questions

1. $\text{H}_3\text{PO}_4(\text{aq})$ is a colourless, syrupy liquid used in detergents, fertilizers, toothpastes, and in carbonated beverages for a “tangy” flavour.

Calculate the percent composition by mass of H, P, and O in this compound.

[Ans: % H = 3.086%, % P = 31.61, %O = 65.31%]

2. Chalcopyrite (CuFeS_2) is a principal ore of copper.

Calculate the number of kilograms of Cu in 3.71×10^3 kg of chalcopyrite.

[Ans: # of kg = 1.28×10^3 kg]

3. Bauxite Al_2O_3 is an ore of Al.

Calculate the number of grams of Al in 371g ore of bauxite.

[Ans: 196g]

4. All of the following substances listed below are fertilizers that contribute nitrogen to the soil. Which of the following is the richest source of nitrogen on a mass percentage basis?

- a) Urea, $(\text{NH}_2)_2\text{CO}$
- b) Ammonium nitrate, NH_4NO_3
- c) Guanidine, $\text{HNC}(\text{NH}_2)_2$
- d) Ammonia, NH_3

[Ans: Ammonia = 82.27]

5. Tin (II) fluoride, SnF_2 , is often added to toothpaste as an ingredient to prevent tooth decay. What is the mass of F in grams in 24.6g of the compound?

[Ans: 5.97g]

6. The aluminum sulfate hydrate $\text{Al}_2(\text{SO}_4)_3 \cdot x\text{H}_2\text{O}$ contains 8.20% Al by mass. Calculate x that is the number of H_2O molecules associated with each $\text{Al}_2(\text{SO}_4)_3$ unit.

[Ans: 18]