Exercise 7.3c

Mole Conversions & Percentage by Mass

Name: _____

Date:_____ Per:_____

The percent composition (or "percentage composition" or "percentage by mass") represents how much weight each element contributes to the overall mass of a compound.

- To find the percentage composition, divide the atomic mass of each element by the formula mass and multiply by 100.
- One percentage is calculated for each individual element that appears in the compound's formula.
- The percentages must add to 100% (or very close).

$$\frac{\textbf{Mass of element}}{\textbf{Mass of compound}} \textbf{ x 100 = percent by mass}$$

Example: *Calculate the percentage by mass of Na_2CO_3.*

Total Mass = 2(22.990) + 12.011 + 3(15.999) = 105.988 amu

Na: $\frac{45.980}{105.988} x\ 100 = 43.38\ \%$ ***C:*** $\frac{12.011}{105.988} x\ 100 = 11.33\ \%$ ***O:*** $\frac{47.997}{105.988} x\ 100 = 45.29\ \%$

DIRECTONS: Complete the following in the space provided. Show all work.

1. Calculate the percent composition of Al_2S_3.

2. Calculate the percent composition of K_2SO_4.

3. Convert 11.5 g C_2H_5OH into moles. *(Review)*

4. Calculate the percent composition of $Al_2(SO_4)_3$.

5. Convert 0.249 mol C_2H_5OH into grams. *(Review)*

Revised: 2021-01-14

Answers: 1) 35.94%, 64.06% 2) 44.87%, 18.40%, 36.73% 3) 0.250 mol C_2H_5OH 4) 15.77%, 28.12%, 56.11% 5) 11.5 g C_2H_5OH 6) 7.59 x 10^{23} f.u. NbI_5
7) 24.21%, 27.02%, 48.77% 8) 121 g $Ba(CN)_2$ 9) 5.68 x 10^{23} m. H_2O 10) 22.57%, 6.50%, 19.36%, 51.57% 11) 0.691 g N_2O_4 12) 1.03 x 10^{25} m. H_2, 2.06 x 10^{25} a. H

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6. Convert 1.26 mol NbI_5 into formula units. *(Review)*

7. Calculate the percent composition of $Cu(ClO_4)_2$.

8. How many grams of $Ba(CN)_2$ are present in 0.638 mol $Ba(CN)_2$? *(Review)*

9. How many molecules of H_2O are present in 0.943 mol H_2O? *(Review)*

10. Calculate the percent composition of $(NH_4)_2C_2O_4$.

11. What is the mass of a sample of 4.52×10^{21} molecules N_2O_4? *(Review)*

12. How many molecules of H_2 are present in a 34.566 gram sample of H_2? How many atoms are present in the sample? *(Review)*

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