

Name : ..... Date : .....

## Finding Percent Composition

1. In an experiment, a student took a 12.2 g sample of table salt and chemically separated sodium from chlorine. He determined there were 5.2 g of chlorine in the sample. What is the percent composition of each element in the table salt?

2. In an experiment, 0.05 moles of iron are mixed with 0.05 moles of sulfur and heated in a test tube to form a new compound. What is the percent mass of each element in the new compound?

3. A chemist breaks down a compound into 3.4 moles of carbon and 6.8 moles of oxygen. What is the percent composition by mass?

4. Find the percent composition of each element in  $N_2S_2$ ?

5. Calculate the percent composition of  $NaHCO_3$ .

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## Finding Percent Composition

### Answers

1. In an experiment, a student took a 12.2 g sample of table salt and chemically separated sodium from chlorine. He determined there were 5.2 g of chlorine in the sample. What is the percent composition of each element in the table salt?

Total mass = 12.2 g

Cl:  $5.2 \text{ g}/12.2 \text{ g} \times 100\% = 43\%$

Na:  $(12.2 \text{ g} - 5.2 \text{ g})/12.2 \text{ g} \times 100\% = 57.4 \%$

2. In an experiment, 0.05 moles of iron are mixed with 0.05 moles of sulfur and heated in a test tube to form a new compound. What is the percent mass of each element in the new compound?

Fe:  $55.85 \text{ g/mol} \times 0.05 \text{ mol} = 2.79 \text{ g}$

S:  $32 \text{ g/mol} \times 0.05 \text{ mol} = 1.6 \text{ g}$

Total mass of the compound =  $2.79 \text{ g} + 1.6 \text{ g} = 4.39 \text{ g}$

Fe:  $2.79 \text{ g}/4.39 \text{ g} = 63.5\%$

S:  $1.6 \text{ g}/4.39 \text{ g} = 36.4\%$

3. A chemist breaks down a compound into 3.4 moles of carbon and 6.8 moles of oxygen. What is the percent composition by mass?

C:  $12 \text{ g/mol} \times 3.4 \text{ mol} = 40.8 \text{ g}$

O:  $16 \text{ g/mol} \times 6.8 \text{ mol} = 108.8 \text{ g}$

Total mass of the compound =  $40.8 \text{ g} + 108.8 \text{ g} = 149.6 \text{ g}$

C:  $40.8 \text{ g}/149.6 \text{ g} \times 100\% = 27.27\%$

O:  $108.8 \text{ g}/149.6 \text{ g} \times 100\% = 72.72\%$

4. Find the percent composition of each element in  $\text{N}_2\text{S}_2$ ?

Molar mass of  $\text{N}_2\text{S}_2 = 2 \times 14 \text{ g} + 2 \times 32 \text{ g} = 92 \text{ g}$

N:  $2 \times (14 \text{ g}/92 \text{ g}) \times 100\% = 30.4\%$

S:  $2 \times (32 \text{ g}/92 \text{ g}) \times 100\% = 69.6\%$

5. Calculate the percent composition of  $\text{NaHCO}_3$ .

Molar mass of  $\text{NaHCO}_3 = 23 \text{ g} + 1 \text{ g} + 12 \text{ g} + 3 \times 16 \text{ g} = 84 \text{ g}$

Na:  $23 \text{ g}/84 \text{ g} \times 100\% = 27.37\%$

H:  $1 \text{ g}/84 \text{ g} \times 100\% = 1.2\%$

C:  $12 \text{ g}/84 \text{ g} \times 100\% = 14.3\%$

O:  $3 \times (16 \text{ g}/84 \text{ g}) \times 100\% = 57.14\%$