Percent Composition by Mass Worksheet

Scoring guide · one credit per question · review written work against each rubric

Percent Composition by Mass

Question 1

Choice (2)

The percentage compares the oxygen contribution to the mass of one mole of the whole compound.

Question 2

H contributes 2(1.01) = 2.02 g/mol. Water has molar mass 18.02 g/mol. (2.02 ÷ 18.02) × 100 percent ≈ 11.2 percent.

Question 3

Choice (2)

The formula contains two oxygen atoms per molecule, so one mole of CO_2 contains two moles of O atoms.

Question 4

The element masses add to the total mass of the compound. Dividing all contributions by that total and summing gives 100 percent, apart from rounding.

Comparing Carbonate Samples

Question 5

Choice (2)

All have the same carbon mass per mole, and Q has the smallest total molar mass. Its carbon fraction is therefore largest.

Question 6

Carbon contributes 12.01 g to 100.09 g of $CaCO_3$ per mole. (12.01 ÷ 100.09) × 100 percent ≈ 12.0 percent.

Question 7

Choice (3)

Na_2CO_3 has the greatest total molar mass and the same carbon contribution per mole as the others.

Question 8

Percent by mass depends on both carbon’s mass and the total formula mass. The other elements contribute different masses in the three compounds.