

Moles, isotopes and chemical formulas

AP Chemistry · Lab answers

Model answers use the sample results. Values follow from the balanced equation and the molar masses, so check that your own table gives answers in a similar range.

Level: AP Chemistry · **Curriculum:** AP Chem Unit 1

Question 1 Mass of mixture and mass lost

Mixture: $26.818 - 24.318 = 2.500$ g. Lost: $26.818 - 26.198 = \mathbf{0.620}$ g.

Question 2 Why constant mass?

Constant mass shows that the reaction is complete and that no more gas or moisture is leaving. **One reading could still contain unreacted solid.**

Question 3 Gas lost per mole

2 mol NaHCO_3 lose 1 mol CO_2 and 1 mol H_2O : $44.009 + 18.015 = \mathbf{62.02}$ g per 168.01 g of NaHCO_3 .

Question 4 Mass of sodium hydrogencarbonate

$m(\text{NaHCO}_3) = 0.620 \times 168.01/62.02 = \mathbf{1.68}$ g.

Question 5 Mass percent

Percent = $1.68/2.500 \times 100 = \mathbf{67.2\%}$. $n(\text{NaHCO}_3) = 1.68/84.006 = \mathbf{0.0200}$ mol.

Question 6 Effect of an error

Spat solid counts as lost mass, so the mass lost looks bigger. The calculated NaHCO_3 would be **too high**.

Question 7 Improvement

Use a larger sample and repeat the experiment three times, or use a lid with a small hole so that no solid escapes. **Averaging repeats reduces random error.**