

Achievement Standard Chemistry 91161
Carry out quantitative analysis - % composition test yourself!

In addition to the titration, this Achievement Standard also has a written component with calculations.

Fold the paper along the dotted line to hide the answer, work out your answer and unfold to check!

$M(\text{Al}) = 27.0 \text{ g mol}^{-1}$	$M(\text{Cu}) = 63.5 \text{ g mol}^{-1}$	$M(\text{Na}) = 23.0 \text{ g mol}^{-1}$
$M(\text{C}) = 12.0 \text{ g mol}^{-1}$	$M(\text{Fe}) = 55.9 \text{ g mol}^{-1}$	$M(\text{O}) = 16.0 \text{ g mol}^{-1}$
$M(\text{Ca}) = 40.1 \text{ g mol}^{-1}$	$M(\text{H}) = 1.00 \text{ g mol}^{-1}$	$M(\text{P}) = 31.0 \text{ g mol}^{-1}$
$M(\text{Cl}) = 35.5 \text{ g mol}^{-1}$	$M(\text{N}) = 14.0 \text{ g mol}^{-1}$	$M(\text{S}) = 32.1 \text{ g mol}^{-1}$

Question	Your answer	Answer (to 3 s.f.)
1. Calculate the percentage composition of NaCl $M(\text{NaCl}) = 23.0 + 35.5 = 58.5 \text{ g mol}^{-1}$	$\% \text{Na} = (23.0/58.5) \times 100 =$ $\% \text{Cl} = (35.5/58.5) \times 100 =$	$\% \text{Na} = 39.3 \%$ $\% \text{Cl} = 60.7 \%$
2. Calculate the percentage composition of FeS $M(\text{FeS}) = 55.9 + 32.1 = 88.0 \text{ g mol}^{-1}$	$\% \text{Fe} =$ $\% \text{S} =$	$\% \text{Fe} = 63.5 \%$ $\% \text{S} = 36.5 \%$
3. Calculate the percentage composition of NaNO ₃ $M(\text{NaNO}_3) = 23.0 + 14.0 + (3 \times 16.0) = 85.0 \text{ g mol}^{-1}$	$\% \text{Na} =$ $\% \text{N} =$ $\% \text{O} = (48.0/85.0) \times 100 =$	$\% \text{Na} = 27.1 \%$ $\% \text{N} = 16.5 \%$ $\% \text{O} = 56.5 \%$
4. Calculate the percentage composition of Na ₂ SO ₄ $M(\text{Na}_2\text{SO}_4) =$	$\% \text{Na} =$ $\% \text{S} =$ $\% \text{O} =$	$\% \text{Na} = 32.4 \%$ $\% \text{S} = 22.6 \%$ $\% \text{O} = 45.0 \%$
5. Calculate the percentage composition of C ₆ H ₁₂ O ₆	$\% \text{C} =$ $\% \text{H} =$ $\% \text{O} =$	$\% \text{C} = 40.0 \%$ $\% \text{H} = 6.67 \%$ $\% \text{O} = 53.3 \%$
6. Calculate the percentage composition of CuSO ₄	$\% \text{Cu} =$ $\% \text{S} =$ $\% \text{O} =$	$\% \text{Cu} = 39.8 \%$ $\% \text{S} = 20.1 \%$ $\% \text{O} = 40.1 \%$
7. Calculate the percentage composition of Al ₂ (SO ₄) ₃	$\% \text{Al} =$ $\% \text{S} =$ $\% \text{O} =$	$\% \text{Al} = 15.8 \%$ $\% \text{S} = 28.1 \%$ $\% \text{O} = 56.1 \%$
8. Calculate the percentage composition of Ca(OH) ₂	$\% \text{Ca} =$ $\% \text{O} =$ $\% \text{H} =$	$\% \text{Ca} = 54.1 \%$ $\% \text{O} = 43.2 \%$ $\% \text{H} = 2.70 \%$
9. Calculate the percentage composition of (NH ₄) ₃ PO ₄	$\% \text{N} =$ $\% \text{H} =$ $\% \text{P} =$ $\% \text{O} =$	$\% \text{N} = 28.2 \%$ $\% \text{H} = 8.05 \%$ $\% \text{P} = 20.8 \%$ $\% \text{O} = 43.0 \%$
10. Calculate the percentage composition of C ₂ H ₅ OH	$\% \text{C} =$ $\% \text{H} =$ $\% \text{O} =$	$\% \text{C} = 52.2 \%$ $\% \text{H} = 13.0 \%$ $\% \text{O} = 34.8 \%$