

CfE Advanced Higher Chemistry

Researching Chemistry - Learning Intentions

a) Gravimetric analysis

1. Gravimetric analysis is used to determine the composition of a substance using measurements of mass
2. Gravimetric analysis uses chemical changes to an unknown substance.
3. Understand the techniques
 - 'weighing by difference' and
 - 'heating to constant mass'.

b) Volumetric analysis

4. Four characteristics required for a substance to be used as a primary standard.
5. How to prepare a standard solution.
6. How to use a primary standard in determination of a solution's unknown concentration.
7. Understand the role of a control to validate experimental techniques.
8. Use of complexometric titrations in quantitative analysis of solutions with a metal ion.
9. Know how to carry out back titrations
10. Carry out calculations from back titration data.

c) Practical skills and techniques

11. Be able to prepare a standard solution by dilution.
12. Be able to prepare and use calibration curves in colorimetry
13. Be able to use colorimetry to determine unknown using solutions of appropriate concentration.
14. Know how to use the techniques below for preparation and purification and evaluating the purity of an experimental product
 - distillation,
 - reflux,
 - vacuum filtration,
 - recrystallisation and
 - use of a separating funnel
 - thin-layer chromatography,
 - melting point and
 - mixed melting point determination
15. To be able to calculate R_f values from chromatographic data
16. Use TLC to follow the course of a reaction.

d) Stoichiometric Calculations

17. Use balanced equations to carry out calculations
 - multi-step reactions,
 - reactant excess, and
 - empirical formulae from given data.
18. Carry out calculations of theoretical & actual yield.
19. Explain differences in theoretical and actual yield.