

Achievement Standard

Subject Reference		Chemistry 2.2			
Title		Carry out an acid-base volumetric analysis			
Level	2	Credits	3	Assessment	Internal
Subfield	Science				
Domain	Chemistry				
Registration date		20 October 2004	Date version published		20 October 2004

This achievement standard involves carrying out an acid-base volumetric analysis using a given titration procedure.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none">Carry out an acid-base titration.Use titration data to calculate the concentration of a solution.	<ul style="list-style-type: none">Carry out an acid-base titration with reasonable precision.Use titration data to correctly determine the concentration of a solution.	<ul style="list-style-type: none">Carry out an acid-base titration with high precision.Use titration data from a reaction where the stoichiometry is not one-to-one, to correctly determine the concentration of a solution.

Explanatory Notes

- 1 This achievement standard is derived from achievement objectives 7.1, 7.2 and 7.3 in *Chemistry in the New Zealand Curriculum*, Learning Media, Ministry of Education, 1994, p. 23.
- 2 Procedures outlined in *Safety and Science: a Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000, should be followed.
- 3 The titration procedure and balanced equation will be provided.
- 4 The standard solution to be used in the titration will be provided.

- 5 In solving volumetric problems, the titration data used may be that collected by the student, or that provided by the assessor.
- 6 For achievement of the standard:
- at least two recorded titre values must fall within a range of 0.4 mL; the average titre value must be within 0.8 mL of the expected outcome
 - the calculation must be carried out using an appropriate procedure (not provided). A minor error (such as incorrect substitution of a numerical error or incorrect conversion of volumes such as mL to L) is allowed but the solution must be a sensible one. Students will not be penalised for using all titre values in their calculation.
- 7 For achievement with merit:
- at least three titre values must fall within a range of 0.4 mL; the average titre value must be within 0.5 mL of the expected outcome
 - a titration calculation must be carried out correctly using only concordant titre values.
- 8 For achievement with excellence:
- at least three titre values must fall within a range of 0.2 mL; the average titre value must be within 0.2 mL of the expected outcome
 - a titration calculation where the stoichiometry is not one-to-one must be carried out correctly using only concordant titre values. The final answer must have correct units and an appropriate number of significant figures.
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Quality Assurance

- 1 Providers and Industry Training Organisations must be accredited by the Qualifications Authority before they can register credits from assessment against achievement standards.
- 2 Accredited providers and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.