

## Achievement Standard

**Subject Reference** Chemistry 1.3

**Title** Describe chemical reactions

**Level** 1      **Credits** 4      **Assessment** External

**Subfield** Science

**Domain** Chemistry

**Status** Registered      **Status date** 5 November 2007

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This achievement standard involves the description of chemical reactions, including the carrying out of calculations.

### Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Describe chemical reactions.</li> </ul>	<ul style="list-style-type: none"> <li>Interpret information about chemical reactions.</li> </ul>	<ul style="list-style-type: none"> <li>Apply understanding of chemical reactions.</li> </ul>

### Explanatory Notes

- This achievement standard is derived from *Chemistry in the New Zealand Curriculum*, Learning Media, Ministry of Education, 1994, achievement objectives 6.2 and 6.3, p. 18.
- Chemical reactions* will be selected from:
  - Oxidation-reduction reactions. These are limited to: simple electron transfer involving elements and monatomic ions (such as  $\text{Cl}_2/\text{Cl}^-$ , metal/metal ion), simple oxygen transfer (such as between metal oxides and either hydrogen or carbon).
  - Precipitation reactions. These are limited to: formation of chlorides of silver and lead; sulfates of calcium, barium and lead; hydroxides and carbonates of copper(II), iron(II), iron(III), zinc, aluminium, calcium, and magnesium ions.
  - Thermal decomposition reactions. These are limited to: hydroxides, carbonates and hydrogen carbonates.
- Describe, interpret information, and apply understanding* of chemical reactions will include the carrying out of calculations.

- 4 *Description and interpretation of chemical reactions* may involve:
- classification of reactions (as given in Explanatory Note 2)
  - relating observations to chemical reactions
  - writing word equations
  - writing formulae of reactants and/or products
  - predicting the formation of a precipitate when two solutions are mixed.
- 5 *Application of understanding of chemical reactions* may involve:
- explanation of observations in terms of the reactants and products involved
  - justification of the classification of reactions using equations and/or observations.
- 6 For Achievement, *calculations* will be straightforward and involve:
- balancing simple equations in which the formulae of reactants and products are given
  - calculating the molar mass of a substance when the formula and molar mass values of the elements are given.
- 7 For Achievement with Merit, *calculations* involve mass-mass calculations in which:
- a given mass of a reactant or product is used to determine the mass of another substance in the same reaction. The balanced equation for the reaction will be given, and the known: unknown mole ratio will be 1:1
  - writing balanced equations from given named reactants or products.
- 8 For Achievement with Excellence, *calculations* will be complex and will involve mass-mass calculations in which:
- a given mass of a reactant or product is used to determine the mass of another substance in the same reaction. The balanced equation for the reaction will be given, and the known: unknown mole ratio will be other than 1:1
  - the formula of a compound is determined.
- 9 The states of substances will be indicated in the question format, but are not required in student responses.
- 10 Solubility rules and a table of ions will be provided.
- 11 A periodic table showing symbols, atomic numbers and molar mass values only will be provided.

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### Quality Assurance

- 1 Providers and Industry Training Organisations must be accredited by NZQA 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.