Achievement Standard

Subject Reference	Chemistry 1.7
Title	Describe properties and reactions of carbon and its compounds
Level	1
Credits	3
Assessment	External
Subfield	Science
Domain	Chemistry
Registration date	21 November 2003
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This achievement standard involves the description of properties and reactions of carbon and its compounds.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Describe properties and reactions of carbon and its compounds.	• Link properties and reactions of carbon and its compounds.	• Apply an understanding of properties and reactions of carbon and its compounds.

Explanatory Notes

1 This achievement standard is derived from *Chemistry in the New Zealand Curriculum*, Learning Media, Ministry of Education, 1994, achievement objectives 6.1 and 6.3, p. 18.

2 *Properties and reactions* of carbon will be selected from the following:
- state at room temperature, colour, and reaction with oxygen
- carbon cycle
- allotropes of carbon – structure, physical properties and uses

3 Compounds of carbon are restricted to oxides of carbon, hydrocarbons (straight chain alkanes up to 6 carbon atoms, ethene and propene), methanol, ethanol and ethanoic acid, polymers formed from ethene and propene. Assessment will include naming (using IUPAC nomenclature) and writing structural formulae.

4 *Properties and reactions* of oxides of carbon will be selected from the following:
- properties of carbon dioxide – density, solubility in water, the acidic nature of its aqueous solution, inability to support combustion, reaction with lime water
- uses of carbon dioxide related to properties
- laboratory preparation of carbon dioxide
- combustion of carbon monoxide.

5 *Properties and reactions* of hydrocarbons and alcohols will be selected from the following:
- complete and incomplete combustion reactions (including balanced equations)
- solubility in water
- melting and/or boiling points
- separation of hydrocarbons by fractional distillation
- production of ethanol by fermentation
- formation of ethanoic acid from ethanol (details of oxidants and balanced equations not included)
- formation of polymers from ethene and propene.

6 *Application of understanding of properties* may include:
- use of organic compounds as fuels
- the impact of carbon and its combustion products on human health and the environment eg global warming.

7 Balanced equations for reactions may be required, where appropriate.

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.

Accreditation and Moderation Action Plan (AMAP) reference 0226