

## Achievement Standard

<b>Subject Reference</b>	Chemistry 1.3		
<b>Title</b>	Demonstrate understanding of aspects of carbon chemistry		
<b>Level</b>	1	<b>Credits</b>	4
		<b>Assessment</b>	External
<b>Subfield</b>	Science		
<b>Domain</b>	Chemistry		
<b>Status</b>	Registered	<b>Status date</b>	30 November 2010
<b>Planned review date</b>	31 December 2016	<b>Date version published</b>	12 December 2013

This achievement standard involves demonstrating understanding of the structure, properties, production, uses, importance and effects of carbon and its chemistry.

***Mutual exclusion exists between this standard and AS90945.***

### Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Demonstrate understanding of aspects of carbon chemistry.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate in-depth understanding of aspects of carbon chemistry.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate comprehensive understanding of aspects of carbon chemistry.</li> </ul>

### Explanatory Notes

- This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 6. It is aligned with the Material World strand, and is related to the material in the *Teaching and Learning Guide for Chemistry*, Ministry of Education, 2010 at <http://seniorsecondary.tki.org.nz>.

This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the [Papa Whakaako](#).

- Demonstrate understanding* typically involves describing, identifying, naming, drawing, giving an account of, or defining, aspects of carbon chemistry. This may require the use of chemistry vocabulary, symbols and conventions (including names and formulae), and completing word equations.
- Demonstrate in-depth understanding* typically involves explaining aspects of carbon chemistry. This may require the use of chemistry vocabulary, symbols and

conventions (including names and formulae), and writing word equations or completing given symbol equations.

- 4 *Demonstrate comprehensive understanding* typically involves linking aspects of carbon chemistry when explaining, elaborating, justifying, relating, evaluating, comparing and contrasting, or analysing. This may require the use of chemistry vocabulary, symbols and conventions (including names and formulae) and writing balanced symbol equations.
- 5 *Aspects of carbon chemistry* will be selected from:
- Structure
    - names of carbon compounds using systematic nomenclature
    - structural formulae
    - covalent bonding between atoms.
  - Properties
    - solubility in water
    - trends in melting and/or boiling points
    - complete and incomplete combustion reactions
    - polymerisation reactions of ethene and propene.
  - Production
    - fractional distillation of crude oil
    - cracking of fractions
    - fermentation
    - methanol from natural gas.
  - Uses and importance
    - fuels
    - polymers from ethene and propene.
  - Effects of combustion products on human health and the environment.
- 6 Carbon compounds are restricted to straight chain alkanes, ethene and propene, methanol and ethanol. Structures and names of alkanes are limited to alkanes which contain no more than eight carbon atoms.
- 7 Assessment Specifications for this achievement standard can be accessed through the Chemistry Resources page found at [www.nzqa.govt.nz/ncea/resources](http://www.nzqa.govt.nz/ncea/resources).

**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.

Accreditation and Moderation Action Plan (AMAP) reference

0233