Achievement Standard

Subject Reference	Chemistry 3.5				
Title	Describe aspects of organic chemistry				
Level	3	**Credits**	5	**Assessment**	External
Subfield	Science				
Domain	Chemistry				
Registration date	23 November 2005	**Date version published**	23 November 2005		

This achievement standard involves describing the structure, physical properties, and reactions of organic compounds.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Describe aspects of organic chemistry.	• Explain and apply aspects of organic chemistry.	• Discuss aspects of organic chemistry.

Explanatory Notes

1 This achievement standard is derived from *Chemistry in the New Zealand Curriculum,* Learning Media, Ministry of Education, 1994, p. 28, achievement objectives 8.1 and 8.3.

2 *Aspects of organic chemistry* includes:
- structures of organic compounds including constitutional isomers and enantiomers
- naming of organic compounds using IUPAC conventions
- physical properties of organic compounds
- reactions of organic compounds.

3 Organic compounds are limited to those containing one or more of the following functional groups: alkene, haloalkane, amine, alcohol, aldehyde, ketone, ester, carboxylic acid, acyl chloride, amide.

4 Structures and names of organic compounds are limited to those compounds containing no more than eight carbons.

5 Physical properties of organic compounds are limited to solubility, melting point, boiling point, rotation of plane-polarised light.

6 Reactions of organic compounds include acid-base, oxidation, elimination and substitution reactions. Substitution reactions include esterification, hydrolysis, and polymerisation.

- acid-base is limited to reactions of carboxylic acids, amines, and carboxylate and alkylammonium salts
- oxidation is limited to reactions using the following reagents: MnO_4^-/H^+, $Cr_2O_7^{2-}/H^+$, Tollens', Fehling's and Benedict's
- elimination is limited to reactions using the following reagents: KOH in alcohol and concentrated H_2SO_4
- substitution is limited to reactions using the following reagents: concentrated HCl, HBr, $SOCl_2$, PCl_3, PCl_5, NaOH, KOH (in alcohol or aqueous solution), NH_3, primary amines, primary alcohols/H^+, primary alcohols, H_2O/H^+, H_2O/OH^-
- polymerisation is limited to formation of polyesters and polyamides including proteins.

7 Terms

- *Describe* involves identifying, naming, drawing, giving characteristics of, giving an account of, and/or defining.
- *Explain and apply* involves describing as well as giving reasons for, making links between chemical concepts and/or observations.
- *Discuss* involves showing understanding by analysing, interpreting, justifying, relating, evaluating, and/or comparing and contrasting.

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