Achievement Standard

Subject Reference Chemistry 1.6

Title Describe selected non-metals and their compounds

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

Subfield Science

Domain Chemistry

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This achievement standard involves the description of the properties, preparations and reactions of selected non-metals and their compounds.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Describe the properties, preparations and reactions of selected non-metals and their compounds.	• Link the properties, reactions and uses of selected non-metals and their compounds.	• Apply an understanding of the properties, reactions and uses of selected non-metals and their 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 *Selected non-metals* are limited to oxygen, sulfur, nitrogen and chlorine.

3 For Achievement, *the properties, preparations and reactions of selected non-metals and their compounds* will be selected from:
- physical properties – state at room temperature, colour, solubility in water
- reaction of sulfur, nitrogen and chlorine with oxygen

- laboratory preparations of ammonia (by heating a mixture of calcium hydroxide and ammonium chloride); hydrogen chloride (from the reaction of sodium chloride and concentrated sulfuric acid); sulfur dioxide (by the reaction of dilute hydrochloric acid with sulfites); oxides of nitrogen (from the reaction of copper with nitric acid)
- processes of commercial preparations of ammonia (by the Haber Process), sulfuric acid (by the Contact Process), superphosphate (from rock phosphate), sodium hypochlorite (from sodium hydroxide and chlorine)
- commercial preparations: chlorine (electrolysis of brine); nitrogen and oxygen (from liquid air); sulfur (from natural gas)
- nitrogen cycle – limited to the major nitrogen-containing species (nitrogen gas, ammonia, nitrate, nitrite and proteins) and the changes involved
- allotropes of sulfur and oxygen, relationship of their structure to their physical properties.

4 For Achievement with Merit and Achievement with Excellence, *the properties, reactions and uses of selected non-metals and their compounds* will be selected from:

- solubility and the acidic nature of the aqueous solutions of sulfur dioxide, nitrogen dioxide, nitric acid and sulfuric acid
- reaction of SO_2 and sulfite as a reductant and its use as a preservative or bleach
- the role of ozone in the upper atmosphere and effects of ozone depletion
- uses of chlorine related to the nature of its aqueous solution
- bleaching and antiseptic properties of sodium hypochlorite
- use of sulfuric acid in batteries and in the manufacture of fertiliser
- impact on people and the environment of nitrogen dioxide and sulfur dioxide, eg photochemical smog and acid rain.

5 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