

# **National Certificate of Educational Achievement**

## **2011 Assessment Report**

### **Chemistry Level 1**

- 90932 Demonstrate understanding of aspects of carbon chemistry**
- 90933 Demonstrate understanding of aspects of selected elements**
- 90934 Demonstrate understanding of aspects of chemical reactions**

## COMMENTARY

Candidates that attempted all questions were normally able to achieve.

It is important that candidates read the question and ensure that it is answered accurately. This includes addressing all bullet points within a longer answer. If a question asks for a comparison or evaluation of two chemicals, it is important that both chemicals are addressed in the answer.

When observations are asked for in a question, it is important that candidates provide observations, not inferences or word equations of the chemical equations.

The amount of space given for a candidate to write an answer is generally a good guide, and candidates are encouraged to think and plan their answer so that only the relevant information is provided, in a concise manner without contradictions.

To demonstrate comprehensive understanding, candidates are required to write answers that apply their knowledge of chemical processes to contexts or situations that may be new to them, as appropriate for a Level 1 Chemistry candidate.

## STANDARD REPORTS

### 90932 Demonstrate understanding of aspects of carbon chemistry

#### ACHIEVEMENT

**Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They typically:**

- drew correct structural formulae
- recognised the products of a reaction
- described the process of fractional distillation
- identified two uses of polypropene
- described a test to distinguish between hexane and ethanol
- described observations.

#### NOT ACHIEVED

**Candidates who were assessed as Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They typically:**

- drew polypropene incorrectly
- described a chemical test without giving an observation, or gave an observation without describing a chemical test
- confused melting and boiling point
- stated that crude oil was a single, large molecule
- did not write equations
- identified ethanol as a base
- confused ozone depletion with the greenhouse effect.

## **ACHIEVEMENT WITH MERIT**

**In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit typically:**

- explained the relationship between boiling point and molar mass
- linked position within the fractionating tower to the boiling point or fraction size
- linked a use for polypropene to a relevant property
- linked a chemical or physical test to the property of the compound
- wrote correct formulae in unbalanced equations.

## **ACHIEVEMENT WITH EXCELLENCE**

**In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence typically:**

- explained two effects of the combustion of fuels and made the link between the product and the effect
- explained the process of fractional distillation and linked it to the properties of the differing molecules in crude oil
- linked two uses of polypropene to a physical or chemical property
- linked a chemical or physical test to the experimental conditions, observations, and chemical or physical property
- wrote balanced equations.

## **90933 Demonstrate understanding of aspects of selected elements**

### **ACHIEVEMENT**

**Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They typically:**

- knew the symbols for the relevant elements
- described how an element becomes an ion
- wrote correct electron configurations for different elements
- described observations of reactions
- provided uses and relevant properties of the allotropes of carbon
- described relevant properties of metals related to their described roles.

### **NOT ACHIEVED**

**Candidates who were assessed as Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They typically:**

- used incorrect symbols for elements
- did not describe how different atoms become ions
- did not recall observations of reactions
- used incorrect chemical terms
- did not identify relevant properties of chemicals.

## **ACHIEVEMENT WITH MERIT**

**In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit typically:**

- explained properties of chemicals
- linked properties to relevant uses of chemicals
- linked observations of reactions to the chemical species involved
- explained chemical concepts concisely and relevantly.

## **ACHIEVEMENT WITH EXCELLENCE**

**In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence typically:**

- explained properties comprehensively and linked them to relevant uses of the chemicals
- provided observations and linked them to the chemical species with an explanation of differences in reactivity
- wrote balanced chemical equations.

## **OTHER COMMENTS**

Successful candidates answered all the questions and wrote concise and relevant explanations.

## **90934 Demonstrate understanding of aspects of chemical reactions**

### **ACHIEVEMENT**

**Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They typically:**

- provided appropriate observations for some reactants and products e.g.  $\text{Ca(OH)}_2$  is a white precipitate,  $\text{CuO}$  is a black solid
- recognised that copper is more reactive than silver
- described a suitable test to identify carbon dioxide
- identified the requirement of heat for the combination reaction
- wrote word equations.

### **NOT ACHIEVED**

**Candidates who were assessed as Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They typically:**

- wrote incorrect formulae e.g.  $\text{CaOH}_2$  instead of  $\text{Ca(OH)}_2$
- provided incorrect or minimal observations for reactants and products e.g. iron is silver and sulfur is a gas
- could not identify the correct products for the thermal decomposition of a range of solids and/or included oxygen as a reactant in the equation
- stated a range of conditions when only heat was required for the combination reaction
- could not determine whether atoms or ions were involved in a reaction e.g. referred to copper metal as  $\text{Cu}^{2+}$  in equation and iron metal as  $\text{Fe(II)}$

- indicated that the properties of an ionic compound are a mixture of the properties of the metal and non-metal from which it is made.

### **ACHIEVEMENT WITH MERIT**

**In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit typically:**

- wrote equations that were unbalanced
- linked accurate observations to the correct chemical species
- explained a displacement reaction in terms of atoms and ions
- explained how atoms form ions to produce an ionic compound.

### **ACHIEVEMENT WITH EXCELLENCE**

**In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence typically:**

- recognised the spectator ions in a reaction
- linked detailed observations to the relevant chemical species
- explained a displacement reaction in terms of atoms, ions, and electron transfer
- recognised that sodium carbonate does not thermally decompose
- discussed the formation of an ionic compound in terms of electron transfer and the electrostatic attraction between the ions
- wrote balanced equations.

### **OTHER COMMENTS**

Many candidates had difficulty explaining how ions are formed from atoms in terms of electron transfer.