

2015 NCEA Assessment Report

Chemistry Level 1 90932, 90933, 90934

Part A: Commentary

Candidates were more likely to be successful if they:

- incorporated expected observations from either practical activities undertaken or demonstrations carried out in the laboratory, or witnessed from differing media sources
- were able to alter pre-prepared answers to convey their understanding in a clear, concise manner to answer the given question
- avoided repetition or addressing aspects not required by the question
- understood what compare and contrast meant, by identifying what is the same and what is different.

Part B: Report on standards

1. Assessment Report for 90932: Demonstrate understanding of aspects of carbon chemistry

Achieved	<p>Candidates who were assessed as Achieved commonly:</p> <ul style="list-style-type: none"> • named and drew structural formulae for organic compounds • explained how alkenes break their double bond to form polymers • explained an effect of complete and/or incomplete combustion on the environment and/or human health • identified crude oil as a mixture of hydrocarbons • recognised that fractional distillation separates hydrocarbons based upon their boiling points • provided observations to distinguish alcohols and alkanes based on their solubility in water • stated conditions required for cracking and/or fermentation.
Not Achieved	<p>Candidates who were assessed as Not Achieved commonly:</p> <ul style="list-style-type: none"> • confused carbon dioxide and carbon monoxide and the impacts of each • stated that propane would be a liquid or solid at room temperature • omitted oxygen from combustion equations • stated that fermentation requires oxygen and/or high temperatures (heat) • identified incorrect products of incomplete and/or complete combustion, e.g. hydrogen gas • stated that alcohols contain a hydroxide ion which makes them soluble.
Achieved with Merit	<p>Candidates who were assessed as Achieved with Merit commonly:</p> <ul style="list-style-type: none"> • wrote correct symbol equations but left them unbalanced • linked the products of complete and/or incomplete combustion to their effects on the environment and/or human health • explained the process of fractional distillation by linking the size of hydrocarbons to their relative boiling points/collection point within the tower • explained why the process of fractional distillation is necessary • linked the solubility observations to the attractions between molecules and water • linked the conditions required for the fermentation process.
Achieved with Excellence	<p>Candidates who were assessed as Achieved with Excellence commonly:</p> <ul style="list-style-type: none"> • related the different types of combustion to their effect on the environment and human health • linked observations of incomplete combustion to the reaction occurring • elaborated on the advantages of biofuels over hydrocarbon fuels • explained that the carbon-carbon double bond in ethene breaks to form a polymer linked by single bonds • linked boiling point and solubility to the strength of attractive forces between molecules

	<ul style="list-style-type: none"> explained the process of fractional distillation by linking the size of molecules to their relative boiling points and the height at which each fraction condenses in the tower wrote balanced symbol equations.
Standard specific comments	<p>Candidates who understood the process of fermentation recognised that yeast respired anaerobically to release energy. A surprising number of candidates considered that yeast perform the fermentation process primarily to produce ethanol.</p> <p>Candidates achieving high Merit or Excellence scores were able to make links between the various observations and the reactions occurring, or linked the magnitude of a boiling point to the strength of the attractive forces between the molecules.</p>

2. Assessment Report for 90933: Demonstrate understanding of aspects of selected elements

Achieved	<p>Candidates who were assessed as Achieved commonly:</p> <ul style="list-style-type: none"> could write electron configurations for elements identified specific elements as either losing or gaining electrons when forming ions described group 1 metal properties / behaviour / trends could identify metals from descriptions of their physical and chemical properties stated uses of metals relating to their specific properties described what alloys are and / or desirable properties that can be achieved through alloying completed word equations for reactions stated a property of sulfur dioxide gas described why chlorine is added to water.
Not Achieved	<p>Candidates who were assessed as Not Achieved commonly:</p> <ul style="list-style-type: none"> confused electron loss / gain in the formation of ions did not recall observations of the reactions of group 1 metals with water (a demonstration likely to have been shown in class) could not describe what an alloy was lacked understanding of chemical / physical properties and how they make specific metals appropriate (or not appropriate) to a given situation could not complete word equations for reactions did not know why chlorine was added to water did not know that sulfur dioxide gas could be used as a preservative.
Achieved with Merit	<p>Candidates who were assessed as Achieved with Merit commonly:</p> <ul style="list-style-type: none"> linked the type of ion formed to the position of the element on the periodic table showed a detailed understanding of the behaviour of group 1 metals wrote unbalanced symbol equations for reactions linked relevant chemical and physical properties of metals to their use explained how a desirable property can be obtained through alloying completed symbol equations for a reaction explained why chlorine was added to water explained a property of sulfur dioxide (pertaining to its use as a preservative).
Achieved with Excellence	<p>Candidates who were assessed as Achieved with Excellence commonly:</p> <ul style="list-style-type: none"> discussed how two different elements could become isoelectronic upon ion formation including detail of how, although isoelectronic, the charges on the ions differ compared and contrasted (with correct observations included) the reactivity of two specific group 1 metals completed balanced symbol equations for specific reactions discussed how desirable properties could be obtained via alloying linked both chemical and physical properties of metals to their suitability (or lack of) for jewellery showed comprehensive understanding of the properties and behaviour of chlorine and sulfur dioxide.

3. Assessment Report for 90934: Demonstrate understanding of aspects of chemical reactions

Achieved	<p>Candidates who were assessed as Achieved commonly:</p> <ul style="list-style-type: none"> • stated some observations or colour changes • identified reaction types • described tests for products, such as water or carbon dioxide • used the activity series provided to identify the occurrence of reactions • used the solubility rules provided to identify precipitation reactions • recognised electron transfer was occurring in the combination reaction.
Not Achieved	<p>Candidates who were assessed as Not Achieved commonly:</p> <ul style="list-style-type: none"> • could not state any colour changes or incorrectly identified reaction types • confused the activity series and could not identify which reaction would occur • defined precipitation or decomposition using the words precipitate or decomposing • confused electron loss and gain during the formation of an ionic bond.
Achieved with Merit	<p>Candidates who were assessed as Achieved with Merit commonly:</p> <ul style="list-style-type: none"> • linked most observations to the reactants and/or products involved • used chemistry-specific terminology in explanations of the different reaction types • linked the activity series and solubility rules to the occurrence of reactions • wrote word equations or unbalanced symbol equations • distinguished between a metal atom and an ion in both equations and explanations • linked reaction types to different chemical species.
Achieved with Excellence	<p>Candidates who were assessed as Achieved with Excellence commonly:</p> <ul style="list-style-type: none"> • linked observations to all the reactants and products involved • wrote balanced symbol or ionic equations • produced concise, yet comprehensive explanations that used chemistry terminology appropriately • used language that enabled different reaction types to be compared and contrasted • outlined the role of electron transfer to the formation of an ionic bond in a combination reaction • explained why a reaction occurred (or did not occur) • justified the selection of appropriate solutions for the identification of ions.
Standard specific comments	<p>Practical work and the subsequent observations are an expected aspect of this standard. Candidates need to be able to link what they see to each of the chemical species involved in the reaction.</p> <p>Definitions of the various reactions should be used where appropriate and should include words that explain what decomposition, combination or a precipitate is, rather than using the noun as an adjective to define the word, e.g. a combination reaction occurs when two chemical species combine together.</p> <p>Candidates need to show that they can apply the facts they have learned to show understanding of the reaction types.</p>