Assessment Report

New Zealand Scholarship Chemistry 2017

Standard 93102

Part A: Commentary

Successful candidates were those who had sound knowledge and in-depth understanding of the Level 3 Chemistry material, and could communicate fluently, with the correct use of chemistry terminology.

Candidates who correctly used the language and symbols of chemistry in discussions and explanations of chemistry related phenomena had more success in applying their knowledge to comprehensively justify their answers.

Mathematical calculations are an important part of Chemistry. Candidates who completed them accurately, used the correct units and thought through the data then integrated it into their answers were more likely to develop quality answers.

Whenever it is appropriate, candidates at this level should be able to provide both quantitative and qualitative evidence for their answers with in the context provided. Candidates who attempted all questions but did not complete the paper were given credit for this.

Part B: Report on Performance

Candidates who were awarded Scholarship with **Outstanding Performance** commonly:

- correctly drew Lewis diagram, including expanded octet for iodine
- predicted correct bond angles with justification
- comprehensively discussed enthalpy and entropy changes and related favourability to spontaneity
- comprehensively justified identification of molecules from both spectra, including exclusion of other molecules
- interpreted mass change data to derive correct formula
- understood solute-solute, solvent-solvent and solute-solvent forces
- understand that molecules can hydrogen bond rather than have hydrogen bonds
- could identify and comprehensively justify the identification of amino acids from given data
- were able to draw clear and concise schemes and show zwitterion formation
- could discuss the redox processes occurring by integrating balanced full equations, cell potential calculations and direction of electron transfer
- capably utilised data given to develop an appropriate procedure to calculate the mass of calcium hydroxide.
- skilfully used given data to carry out a complicated titration calculation
- gave well set out, labelled working with units

- were able to attempt to use Ka values to determine the concentration of the acid.

Candidates who were awarded **Scholarship** commonly:

- correctly totalled the number of electrons and determined that one atom must have expanded octet
- gave justification for bond angles around N atom
- discussed either enthalpy or entropy changes
- correctly calculated enthalpy changes
- correctly identified molecules using spectra without discussion around other possible molecules
- justified the loss of water from the hydrated compound
- showed understanding of key aspects of intermolecular forces of attraction
- could use the data provided to identify amino acids and give some justification for their reasoning
- were able to give reagents and conditions required to convert from one organic functional group to another
- could calculate the correct pH to precipitate the solids and describe a strategy to separate them based on this
- could use the data to attempt the titration calculation
- recognised the reason for two pka values and linked this to the calculation in part i).

Other candidates

Candidates who were **no**t awarded Scholarship commonly:

- did not recognise that either N or I had an expanded octet
- attempted to discuss the formation of nitrogen triiodide rather than the decomposition
- could not interpret spectroscopic data to identify molecules
- could not thermal decomposition data
- did not understand intermolecular forces of attraction
- used generic rules of thumb such as “like dissolves like” without explaining what these mean and how they relate to the question
- were unable to identify methods of converting one organic functional group to another
- were unable to write Ks expressions
- did not give equations for the precipitation reactions occurring
- did not identify a strategy to separate the ions
- could not make a sensible attempt at the titration calculation
- could not use pka expression to calculate pH.

Subject page

Previous years' reports
2016 (PDF, 203KB)