External Assessment Report 2010

Subject	**Chemistry**
Level	**Intermediate 2**

The statistics used in this report are pre-appeal.

This report provides information on the performance of candidates which it is hoped will be useful to teachers/lecturers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding. It would be helpful to read this report in conjunction with the published question papers and marking instructions for the Examination.

Comments on candidate performance

General comments

The number of centres presenting candidates for Chemistry Intermediate 2 has remained stable, however there continues to be a ‘turnover’ of centres — with 11 new centres and 35 ‘returning centres’

Whilst the majority of the candidates presented for this examination appear to come from an S4 cohort there are a large number of centres presenting S5 candidates. In general terms, the performance of S4 candidates appears to be stronger than that of the S5 cohort — more S4 candidates scored higher marks.

The vast majority of candidates attempted every question in Section B where the average mark was approximately 64%. Candidates’ performances in Section A remain strong (70% was the average score).

Areas in which candidates performed well

Section A questions: 1, 2, 7, 8, 9, 11, 12, 15, 23, 25, 26, 27.

Section B questions:

Q1 (a) Nucleus
Q1 (b) (i) Mass number
Q1 (b) (ii) Why an atom is neutral

Q2 (a) Endothermic
Q2 (c) Solvent
Q2 (d) Calculation — common mistake was incorrect use of calculator

Q3 (a) Bonding and structure of diamond
Q3 (b) Outer electron diagram of methane

Q4 (a) (i) Percentage of silver from graph
Q4 (a) (ii) Mass of silver from %
Q4 (b) Mass calculation — generally well done but most common mistake was incorrect use of mole ratio and in calculating mass of 2 moles of silver sulphide

Q5 (a) PPA Cracking
Q5 (b) Suck back
Q5 (c) (ii) Another reason for using a catalyst
Q5 (d) Addition reaction — extremely well done by candidates

Q6 (a) Structure for hexan–3–one
Q6 (b) Naming the ketone
Q6 (c) Predicting the boiling point — common wrong answer was to state the predicted difference in the boiling point, eg 26

Q7 (a) (i) Fermentation
Q7 (a) (ii) Yeast
Q7 (b) Denaturing of yeast

Q9 (a) Photosynthesis
Q9 (b) Starch/glucose test
Q9 (c) Identifying the hydroxyl group — common wrong answer was to circle the carbon atom as well as the hydroxyl group

Q10 (a) pH of lemonade
Q10 (b) (i) Trend statement from graph

Q11 (a) Acid rain
Q11 (b) (i) Elements in calcium carbonate
Q11 (b) (ii) Hydrogen/water

Q12 (b) (ii) Why scratched zinc coating protects iron — however, some candidates made cancelling errors, eg zinc rusts, zinc supplies ions

Q13 (a) Neutral

Q14 (a) Labelling diagram

Areas which candidates found demanding

Section A questions: 13, 17, 28 and 30.

Section B questions:

1 (b) (iii) Naming the alkali metal family — common wrong answers were ‘alkaline family’ or just ‘alkali’

2 (b) State symbols for reactants and products — common wrong answer was ‘classifying ammonium nitrate as a liquid’

3 (c) Drawing shape of methane — common wrong answer was to draw square planar

5 (c) (i) Naming catalyst used in cracking — common wrong answer was potassium permanganate

7 (c) Distillation

8 (a) Naming ester family
8 (b) Hydrolysis reaction
8 (c) Drawing full structural formula for butanoic acid
9 (d) Electron arrangement for the magnesium ion

10 (b) (ii) Extrapolating graph and reading result — common mistake was inaccurate reading of graph

12 (a) Paint stopping water or oxygen
12 (b) (i) Galvanising — common wrong answer was sacrificial protection

13 (b) Volumetric calculation. Candidates frequently did not apply mole ratio, mixed up GFM calculations, or used incorrect information from the question into formulae (eg CVP = CVP).

14 (a) (ii) PPA to make cell reliable
14 (b) (i) Electron flow and direction
14 (b) (ii) Conductivity of carbon

Advice to centres for preparation of future candidates

- Centres should stress to candidates that they have to use their calculator correctly, especially if brackets are involved.

- Centres should stress to candidates that drawing a square planar diagram of methane and using dotted lines and triangles does not turn it into a tetrahedral shape.

- Candidates must provide detail in PPA questions to achieve the full marks. For example:
  5 (a) The catalyst is heated first, then the mineral wool.

- Centres should stress to candidates that starting colours are required in chemical tests. For example:
  Benedict's solution will turn from blue to orange

- Centres should stress to candidates the correct 'cause and effect' when describing a trend from a graph.

- Centres should stress to candidates that if they are using the equation:
  moles = concentration $\times$ volume
  then volume must be in litres.

Statistical information: update on Courses

Number of resulted entries in 2009	4108
Number of resulted entries in 2010	4317

Statistical information: performance of candidates

Distribution of Course awards including grade boundaries

Distribution of Course awards	%	Cum. %	Number of candidates	Lowest mark
Maximum Mark — 80				
A	41.0%	41.0%	1768	58
B	21.2%	62.1%	914	49
C	17.7%	79.8%	764	41
D	6.4%	86.2%	275	37
No award	13.8%	100.0%	596	–

General commentary on grade boundaries

While SQA aims to set examinations and create marking instructions which will allow a competent candidate to score a minimum of 50% of the available marks (the notional C boundary) and a well prepared, very competent candidate to score at least 70% of the available marks (the notional A boundary), it is very challenging to get the standard on target every year, in every subject at every level.

Each year, therefore, SQA holds a grade boundary meeting for each subject at each level where it brings together all the information available (statistical and judgemental). The Principal Assessor and SQA Qualifications Manager meet with the relevant SQA Head of Service and Statistician to discuss the evidence and make decisions. The meetings are chaired by members of the management team at SQA.

The grade boundaries can be adjusted downwards if there is evidence that the exam is more challenging than usual, allowing the pass rate to be unaffected by this circumstance.

The grade boundaries can be adjusted upwards if there is evidence that the exam is less challenging than usual, allowing the pass rate to be unaffected by this circumstance.

Where standards are comparable to previous years, similar grade boundaries are maintained.

An exam paper at a particular level in a subject in one year tends to have a marginally different set of grade boundaries from exam papers in that subject at that level in other years. This is because the particular questions, and the mix of questions are different. This is also the case for exams set in centres. If SQA has already altered a boundary in a particular year in say Higher Chemistry this does not mean that centres should necessarily alter boundaries in their prelim exam in Higher Chemistry. The two are not that closely related as they do not contain identical questions.

SQA's main aim is to be fair to candidates across all subjects and all levels and maintain comparable standards across the years, even as Arrangements evolve and change.