2008 Chemistry

Intermediate 1

Finalised Marking Instructions

Intermediate 1 Chemistry

General information for markers

The general comments given below should be considered during all marking.

1 Marks should **not** be deducted for incorrect spelling or loose language as long as the meaning of the word(s) is conveyed.

Example: Answers like 'distilling' (for 'distillation') and 'it gets hotter' (for 'the temperature rises') should be accepted.

2 A right answer followed by a wrong answer should be treated as a cancelling error and no marks should be given.

Example: What is the colour of universal indicator in acid solution?

The answer 'red, blue' gains no marks.

3 If a right answer is followed by additional information which does not conflict, the additional information should be ignored, whether correct or not.

Example: Why can the tube not be made of copper?

If the correct answer is related to a low melting point, and the candidate's answer is 'It has a low melting point and is coloured grey' this would **not** be treated as having a cancelling error.

4 Full marks should be awarded for the correct answer to a calculation on its own; the part marks shown in the marking scheme are for use when working is given.

5 A half mark should be deducted in a calculation for each arithmetic slip **unless stated otherwise in the marking scheme**.

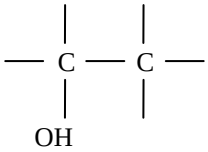
6 A half mark should be deducted for incorrect or missing units **only when stated in the marking scheme**.

7 Where a wrong numerical answer (already penalised) is carried forward to another step, no further penalty is incurred provided the result is used correctly.

8 Ignore the omission of one H atom from a full structural formula provided the bond is shown.

9 With structures involving an –OH or an $–NH_2$ group, a half mark should be deducted if the 'O' or 'N' are not bonded to a carbon, ie $OH–CH_2$ and $NH_2–CH_2$.

10 When drawing structural formulae, a half mark should be deducted if the bond points to the 'wrong' atom, eg



11 A symbol or correct formula should be accepted in place of a name **unless stated otherwise in the marking scheme**.

12 When formulae of ionic compounds are given as answers it will only be necessary to show ion charges if these have been specifically asked for. However, if ion charges are shown, they must be correct. If incorrect charges are shown, no marks should be awarded.

13 If an answer comes directly from the text of the question, no marks should be given.

Example: A student found that 0·05 mol of propane, C_3H_8 burned to give 82·4 kJ of energy.

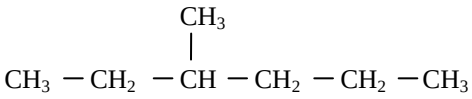
$$C_3H_8(g) + 5O_2(g) \longrightarrow 3CO_2(g) + 4H_2O(l)$$

Name the kind of enthalpy change which the student measured.

No marks should be given for 'burning' since the word 'burned' appears in the text.

14 A guiding principle in marking is to give credit for (partially) correct chemistry rather than to look for reasons not to give marks.

Example 1: The structure of a hydrocarbon found in petrol is shown below.



Name the hydrocarbon.

Although not completely correct, the answer '3, methyl-hexane' should gain the full mark ie ignore wrong use of commas and dashes.

Example 2: A student measured the pH of four carboxylic acids to find out how their strength is related to the number of chlorine atoms in the molecule. The results are shown.

Structural formula	**pH**
CH_3COOH	1·65
$CH_2ClCOOH$	1·27
$CHCl_2COOH$	0·90
CCl_3COOH	0·51

How is the strength of the acids related to the number of chlorine atoms in the molecule?

Although not completely correct, an answer such as 'the more Cl_2, the stronger the acid' should gain the full mark.

15 Unless the question is clearly about a non-chemistry issue, eg costs in industrial chemistry, a non-chemical answer gains no marks.

Example: Why does the (catalytic) converter have a honeycomb structure?

A response such as 'to make it work' may be correct but it is not a chemical answer and the mark should not be given.

16 When it is very difficult to make a decision about a partially correct answer, a half mark can be awarded.

17 When marks have been totalled, a half mark should be rounded up.

2008 Chemistry Intermediate 1

Marking scheme

Section A

1	C	11	A
2	A	12	C
3	D	13	A
4	B	14	C
5	C	15	B
6	A	16	D
7	A	17	B
8	D	18	D
9	B	19	C
10	D	20	A

Section B

Question	Acceptable Answer	Mark	Worth ½	Worth 0
1 (a)	Mg	**1 or 0**		MG/mg
(b)	Carbon; C	**1 or 0**		
(c)	11 23	**1 or 0** **1 or 0**	 Worth (1) if no of protons is incorrect but mass number calculated correctly	
2 (a)	Sodium (Na)/Oxygen (o)	**½ ; ½**	Cancelling error -½ if third element given; accept aluminium	
(b)	Propene (propylene)	**1 or 0**		Propane
(c)	Chlorine; C1	**1 or 0**		Chloride; bleach; chlorine with another element

Question	Acceptable Answer	Mark	Worth ½	Worth 0
3 (a)	B D A C	**1 or 0**		
(b)	Place (the test-tube) in a beaker of hot water/Place in water bath	**1 or 0**	Heat it up; Heat	Bunsen burner Burn Heat it to dryness
(c)	Orange/red; brown/orange; yellow/orange; green/ orange Brick orange	**1 or 0**		Pink Green
4 (a)	Silicon/Si	**1 or 0**		
(b)	Low density/light/lightweight (ignore additional valid answer eg strong)	**1 or 0**		Good conductor cancels low density
(c) (i)	The bulb would light/switch on/turn on/light/glow	**1 or 0**		
(ii)	Non-conductor	**½ or 0**		Insulator
	Conductor	**½ or 0**		

Question	Acceptable Answer	Mark	Worth ½	Worth 0
5 (a)	hydrocarbon	**1 or 0**		
(b) (i)	$C_8 H_8$	**1 or 0**		C_8H_{18}
(ii)	Has a much higher melting point	**1 or 0**		Doesn't have a negative sign before it
6 (a)	They dissolve grease/forms a lather/separates grease Using laureth sulphates	**1 or 0**	To clean the hair	Mix with grease
(b)	pH 1-6/pH< 7	**1 or 0**		Any mention of pH 7
(c)	Sodium laureth sulphate Magnesium laureth sulphate Aqua laureth sulphate laureth sulphate	**1 or 0**		Sodium laureth Magnesium laureth

Question	Acceptable Answer	Mark	Worth ½	Worth 0
7 (a)	Oxygen/O/O_2	**1 or 0**		
(b) (i)	It has the highest % of carbon/must demonstrate relationship between number/% carbon	**1 or 0**		highest % of it
(ii)	90/100 × 200 = 180kg	**1 or 0**	For working – 90/100 x 200	
(c)	They cannot be replaced/cannot be remade/run out/won't last forever	**1 or 0**		Fossil fuel/rare/not a lot of it
8 (a)	10	**1 or 0**		
(b) (i)	B	**1 or 0**		
(ii)	Waste plant material	**1 or 0**		
(c) (i)	Plastic; glass; paper; metal tins; plant material (compost) /clothes/ink catridges etc (any one of above)	**1 or 0**		
(ii)	Methane/biogas/natural gas	**1 or 0**		biofuel

Question	Acceptable Answer	Mark	Worth ½	Worth 0
9 (a)	Prolong shelf-life; makes food last longer; not spoil (go bad) as quickly; prevents bugs/micro-organisms from growing	**1 or 0**		To preserve food/make food taste better
(b)	Sorbic acid	**1 or 0**		Benzoic acid cancels sorbic acid
(c)	hydrocarbons	**1 or 0**		
(d)	SO_2/S_1O_2 / O_2S	**1 or 0**	SO2	SO
10 (a) (i)	Provide energy/respiration can take place	**1 or 0**		Keep us going/keep sugar levels high
(ii)	To reduce the chance of heart disease; reduce obesity; clogs arteries/stop you getting fat/strokes/high blood pressure	**1 or 0**	Keep us healthy/health risk	Cancer
(b) (i)	To keep the gut working well/helps pass food through gut/make you go to the toilet	**1 or 0**		Help digest food
(ii)	3.6g	**1 or 0**	Working shown but wrong answer	

Question	Acceptable Answer	Mark	Worth ½	Worth 0
11 (a)	Light energy (sunlight)/sun/solar	**1 or 0**		Heat energy
(b)	Carbon dioxide/CO_2	**1 or 0**		
(c)	Decreases/gets smaller/goes down/falls	**1 or 0**		

[END OF MARKING INSTRUCTIONS]