8825 – 6223M

Diploma Programme
Programme du diplôme
Programa del Diploma

Markscheme

November 2025

Chemistry

Standard level

Paper 1B

8 pages

Subject Details: Chemistry Standard Level Paper 1B Markscheme

Candidates are required to answer **ALL** questions. Maximum total = **[25 marks]**.

1. Each row in the "Question" column relates to the smallest subpart of the question.

2. The maximum mark for each question subpart is indicated in the "Total" column.

3. Each marking point in the "Answers" column is shown by means of a tick (✓) at the end of the marking point.

4. A question subpart may have more marking points than the total allows. This will be indicated by "**max**" written after the mark in the "Total" column. The related rubric, if necessary, will be outlined in the "Notes" column.

5. An alternative word is indicated in the "Answers" column by a slash (**/**). Either word can be accepted.

6. An alternative answer is indicated in the "Answers" column by "***OR***". Either answer can be accepted.

7. An alternative markscheme is indicated in the "Answers" column under heading **ALTERNATIVE 1** *etc*. Either alternative can be accepted.

8. Words inside chevrons **« »** in the "Answers" column are not necessary to gain the mark.

9. Words that are underlined are essential for the mark.

10. The order of marking points does not have to be as in the "Answers" column, unless stated otherwise in the "Notes" column.

11. If the candidate's answer has the same "meaning" or can be clearly interpreted as being of equivalent significance, detail and validity as that in the "Answers" column then award the mark. Where this point is considered to be particularly relevant in a question it is emphasized by ***OWTTE*** (or words to that effect) in the "Notes" column.

12. Remember that many candidates are writing in a second language. Effective communication is more important than grammatical accuracy.

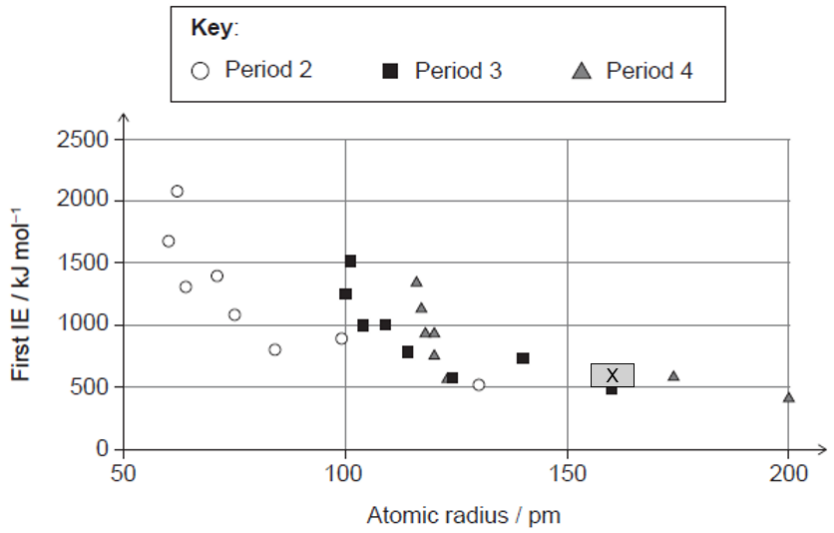
13. Occasionally, a part of a question may require an answer that is required for subsequent marking points. If an error is made in the first marking point then it should be penalized. However, if the incorrect answer is used correctly in subsequent marking points then **follow through** marks should be awarded. When marking, indicate this by adding **ECF** (error carried forward) on the script.

14. Do **not** penalize candidates for errors in units or significant figures, **unless** it is specifically referred to in the "Notes" column.

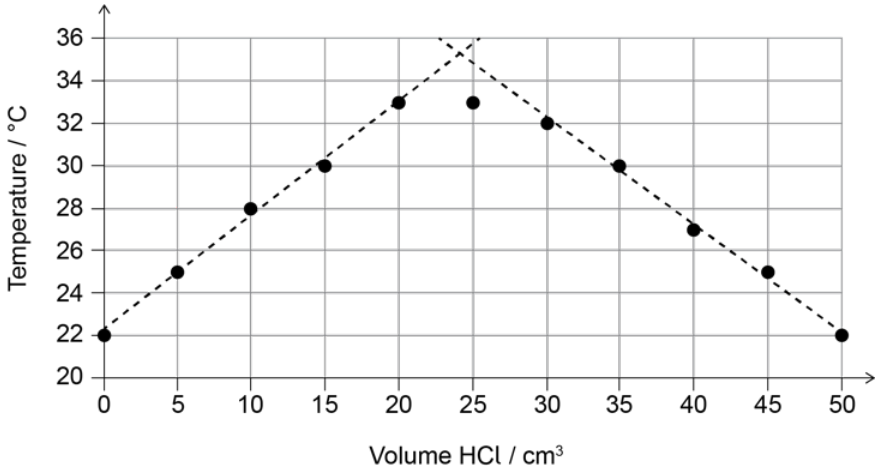
15. If a question specifically asks for the name of a substance, do not award a mark for a correct formula unless directed otherwise in the "Notes" column. Similarly, if the formula is specifically asked for, do not award a mark for a correct name unless directed otherwise in the "Notes" column.

16. If a question asks for an equation for a reaction, a balanced symbol equation is usually expected, do not award a mark for a word equation or an unbalanced equation unless directed otherwise in the "Notes" column.

Ignore missing or incorrect state symbols in an equation unless directed otherwise in the "Notes" column.

Question			Answers	Notes	Total
1.	(a)		 ✓	*Accept* *x from 155–165* *y from 500–700*	**1**
1.	(b)		closer an electron is to the nucleus the greater the «electrostatic» attraction ✓	*Accept smaller atomic radius for electron closer to the nucleus.* *Accept converse statement.*	**1**
1.	(c)	(i)	inverse/negative «correlation» ✓	*Do **not** accept inverse proportionality.* *Award **[0]** if linear relationship mentioned.* *Do **not** accept when AR increases IE decreases.*	**1**

1.	**(c)**	**(ii)**	similar trends / distribution of points ✓ as the period number increases the curve/distribution shifts down ***AND*** to the right ***OR*** as the period number increases the curve/distribution shifts to lower IE ***AND*** greater radius ✓	*For M1 accept IE decreases as atomic radius increases .*	**2**

Question			Answers	Notes	Total
2.	**(a)**	**(i)**	acids/HCl/alkalis/NaOH dangerous/corrosive ✓	*Accept "Burn/irritate/cause damage to skin/eyes" for corrosive.* *Accept other correct hazards, such as broken glass.*	**1**
2.	**(a)**	**(ii)**	 ***BOTH*** lines pass close to relevant data points (**not** 25cm^3) ***AND*** extend to where they cross ✓	*Do **not** accept lines that are not straight or obviously drawn without a ruler.* *Accept RH lines that take into account, but do not touch, the 25 cm^3 point.*	**1**

2.	**(b)**	**(i)**	Student B ***AND*** uses less reagent «so reducing chemical waste» ✓	*Accept "less waste" for reason.* *Accept hydrochloric acid/HCl/sodium hydroxide/NaOH instead of reagent.*	**1**
2.	**(b)**	**(ii)**	Student B ***AND*** burette/pipette more precise «than measuring cylinder» ✓	*Accept Student B **AND** more precise equipment / lower stated uncertainty.*	**1**
2.	**(b)**	**(iii)**	no ***AND*** uncertainty of intersect «much» greater than precision of volume measurement ✓		**1**
2.	**(b)**	**(iv)**	similar for low volumes of HCl ✓ temperatures lower for Student A at large volumes of HCl ✓	*Award M1 for general descriptions such as "temperature increases to maximum and then decreases".*	**2**
2.	**(b)**	**(v)**	*Student:* B ***AND*** *Volume*: 50 ✓ *Reason: «has been losing heat for*» longest time ✓		**2**
2.	**(b)**	**(vi)**	replace «glass, conical» flask with a polystyrene cup ✓	*Accept improve insulation, or any change that would improve insulation, such as adding a lid.* *Do **not** accept water bath.* *Do **not** accept closed/isolated system.* *Do **not** accept calorimeter, unless increased insulation also mentioned.*	**1**

Question			Answers	Notes	Total
3.	(a)		«solute/solid very» soluble in hot solvent ***AND*** not very soluble in cold solvent ✓	*Accept insoluble instead of "not very soluble".* *Accept solubility varies significantly with temperature / much more soluble in hot solvent than cold solvent.*	**1**
3.	(b)		*Step:* II ***AND*** *Type:* insoluble/less soluble «impurities» ✓ *Step:* IV ***AND*** *Type:* «more» soluble ✓	*Accept Step V as an alternative to Step IV.* *Award [1 max] for Step II **AND** Step IV/V if type of impurity is missing or incorrect.*	**2**
3.	(c)		*Too much solvent:* low/decreased yield ✓ *Too little solvent:* low/decreased purity ✓	*Accept increased purity for M1.* *Accept decreased yield for M2.*	**2**
3.	(d)		depletion of ozone layer ✓	*Do **not** accept health issues.* *Accept hole in the ozone layer.*	**1**

Question			Answers	Notes	Total
4.	(a)		$FeSO_4$ / $FeCl_2$ ✓	*Accept other iron(II) salts.* *Award [1] for the chemical formula of a suitable salt which is given as part of an equation,* *such as* $FeSO_4 \rightarrow Fe^{2+}(aq) + SO_4^{2-}(aq)$	**1**

4.	**(b)**		salt bridge «immersed in both half-cells» ✓ «both» electrodes connected to light bulb «by wires» ✓	*Accept specific examples of salt bridges.* *Do **not** accept half-cells instead of electrodes.* *Award marks if these components are clearly shown in a diagram.* *Ignore any meters mentioned.*	**2**
4.	**(c)**		A / amperes / amps ✓	*Accept mA, milliamperes, milliamps.* *Award **[0]** if any other units are given.*	**1**