



**Coimisiún na Scrúduithe Stáit**  
**State Examinations Commission**

**Leaving Certificate 2016**

**Marking Scheme**

**Chemistry**

**Ordinary Level**

### **Note to teachers and students on the use of published marking schemes**

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

### **Future Marking Schemes**

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.

## Introduction

**In considering the marking scheme the following should be noted.**

1. In many cases only key phrases are given which contain the information and ideas that must appear in the candidate's answer in order to merit the assigned marks.
2. The descriptions, methods and definitions in the scheme are not exhaustive and alternative valid answers are acceptable.
3. The detail required in any answer is determined by the context and the manner in which the question is asked, and by the number of marks assigned to the answer in the examination paper and, in any instance, therefore, may vary from year to year.
4. The bold text indicates the essential points required in the candidate's answer. A double solidus (//) separates points for which separate marks are allocated in a part of the question. Words, expressions or statements separated by a solidus (/) are alternatives which are equally acceptable for a particular point. A word or phrase in bold, given in brackets, is an acceptable alternative to the preceding word or phrase. Note, however, that words, expressions or phrases must be correctly used in context and not contradicted, and where there is evidence of incorrect use or contradiction, the marks may not be awarded. Cancellation may apply when a candidate gives a list of correct and incorrect answers.
5. In general, names and formulae of elements and compounds are equally acceptable except in cases where either the name or the formula is specifically asked for in the question. However, in some cases where the name is asked for, the formula may be accepted as an alternative.
6. There is a deduction of one mark for each arithmetical slip made by a candidate in a calculation.
7. Bonus marks at the rate of 10% of the marks obtained will be given to a candidate who answers entirely through Irish and who obtains less than 75% of the total marks. In calculating the bonus to be applied decimals are always rounded down, not up e.g., 4.5 becomes 4; 4.9 becomes 4, etc. The bonus table given on the next page applies to candidates who answer entirely through Irish and who obtained more than 75% of the total marks.



# Coimisiún na Scrúduithe Stáit

**400@10%**

## *Marcanna Breise as ucht freagairt trí Ghaeilge*

Léiríonn an tábla thíos an méid marcanna breise ba chóir a bhronnadh ar iarrthóirí a ghnóthaíonn níos mó ná 75% d'iomlán na marcanna.

N.B. Ba chóir marcanna de réir an ghnáthráta a bhronnadh ar iarrthóirí nach ghnóthaíonn níos mó ná 75% d'iomlán na marcanna don scrúdú. Ba chóir freisin an marc bónais sin a **shlánú síos**.

## *Tábla 400 @ 10%*

Bain úsáid as an tábla seo i gcás na n-ábhar a bhfuil 400 marc san iomlán ag gabháil leo agus inarb é 10% gnáthráta an bhónais.

Bain úsáid as an ngnáthráta i gcás 300 marc agus faoina bhun sin. Os cionn an mharc sin, féach an tábla thíos.

Bunmharc	Marc Bónais
301 - 303	29
304 - 306	28
307 - 310	27
311 - 313	26
314 - 316	25
317 - 320	24
321 - 323	23
324 - 326	22
327 - 330	21
331 - 333	20
334 - 336	19
337 - 340	18
341 - 343	17
344 - 346	16
347 - 350	15

Bunmharc	Marc Bónais
351 - 353	14
354 - 356	13
357 - 360	12
361 - 363	11
364 - 366	10
367 - 370	9
371 - 373	8
374 - 376	7
377 - 380	6
381 - 383	5
384 - 386	4
387 - 390	3
391 - 393	2
394 - 396	1
397 - 400	0

**Candidates are required to attempt 8 questions in total. All questions carry equal marks (50).**

**Section A**

**At least two questions must be answered from this section.**

**Section B**

**At least five questions must be answered from this section.**

Eight items to be answered in **Question 4**. Six marks allocated to each item and one additional mark to be added to each of the first two items for which the highest marks are awarded.

Note that candidates who attempt **Question 10** are required to answer two of the parts (a), (b) and (c) and candidates who attempt **Question 11** are required to answer two of the parts (a), (b) and (c) where candidates who answer part (c) may choose **A** or **B**.

## Section A

### QUESTION 1

- (a) (i) IDENTIFY: **ethanol / C<sub>2</sub>H<sub>5</sub>OH**
- (ii) GIVE: **aluminium oxide / Al<sub>2</sub>O<sub>3</sub>** (6 + 3)
- (iii) STATE: **avoid fire** by contact between flame and flammable reactant or product / **avoid suckback** of cold water into hot test tube by / **disconnect delivery tube** from water trough at end of experiment before removing Bunsen burner / **lift apparatus out of water** at end of experiment before removing Bunsen burner / **wear gloves / tie back hair / wear eye protection** (6)
- (iv) DESCRIBE: **add bromine** solution (water) / **add acidified permanganate (KMnO<sub>4</sub>/H<sup>+</sup>) // brown (red, orange) / pink (purple) // fades (lightens) / changes to colourless** is a positive test (3 × 3)  
[Reagent and colour change must match.]
- (v) WRITE: **C<sub>2</sub>H<sub>4</sub> + 3O<sub>2</sub> → 2CO<sub>2</sub> + 2H<sub>2</sub>O** PRODUCTS: (3) BALANCING: (3)
- (b) (i) IDENTIFY: **calcium carbide / calcium dicarbide / carbide / CaC<sub>2</sub>** (6)
- (ii) DESCRIBE: **unstopper and quickly insert lighting taper into test tube**
- WHAT: **sooty flame / luminous (yellow) flame / limewater turns milky** (6 + 3)
- (iii) GIVE: **cutting (welding) metals / ripening bananas / oxyacetylene torch** (5)

## QUESTION 2

- (a) EXPLAIN: **sufficient acid (solution from burette) has been added to exactly react with the base (solution in conical flask) / when indicator just changes from one colour to the other / base (solution in conical flask) just used up / equal number of moles of hydrochloric acid (HCl) and sodium hydroxide (NaOH) reacted** (5)  
[Allow 3 marks if underlined words omitted from statements above.]

- (b) NAME: **methyl orange / methyl red / phenolphthalein, etc** (6)

- (c) (i) DESCRIBE: **rinse with deionised (distilled, pure) water // rinse with solution it will contain (acid, hydrochloric acid, HCl)** (2 × 3)

*or*

- rinse clean burette with solution it will contain (acid, hydrochloric acid, HCl)** (6)

- (ii) NAME: **pipette** (3)

- (d) CALCULATE: (i) **0.09 mol l<sup>-1</sup>** (9)

$\frac{25 \times M}{1} =$	(3)
$\frac{22.5 \times 0.10}{1}$	(3)
$M = 0.09 \text{ mol l}^{-1}$	(3)

[Award (3) for  $\frac{V_1 M_1}{n_1}, \frac{V_2 M_2}{n_2}$  if no marks given for CALCULATE: (i) above.]

- (ii) **3.6 g l<sup>-1</sup>** (6)

$M_r = 40^*$	(3)
$0.09 \times 40 = 3.6 \text{ g l}^{-1}$	(3)

\* Addition must be shown for error to be treated as a slip.

[Award (5) for  $0.09 \times 40$  not calculated or calculated incorrectly.]

- (e) DESCRIBE: **repeat omitting indicator // 22.5 cm<sup>3</sup> acid (HCl) to 25 cm<sup>3</sup> base (NaOH) // in a conical flask (beaker, evaporating basin, evaporating dish) // heat (evaporate water, boil water) / leave to evaporate over time // until crystals form / to dryness / filter to get dry sample** (3 × 3)

[Allow marks for good diagram(s).][Deduct 3 where there is no diagram.]

- (f) WHAT: **yellow** (6)

### QUESTION 3

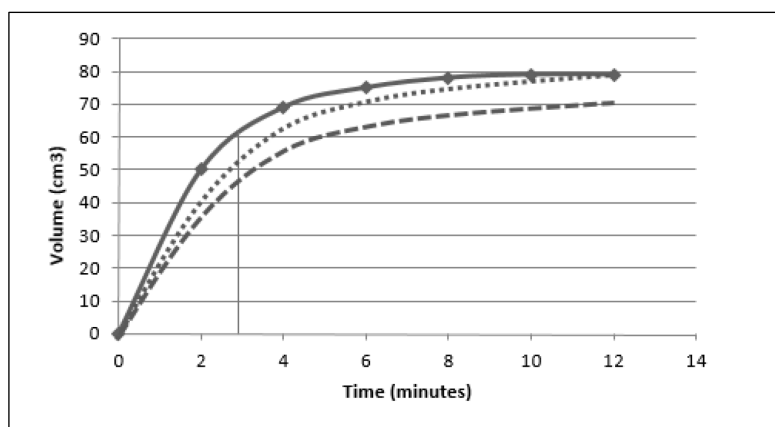
(a) WHAT: substance that **alters (increases, decreases) rate (speed, activation energy) of a reaction without being consumed** (5)

GIVE: **manganese(IV) oxide / manganese dioxide / MnO<sub>2</sub> / potassium iodide / KI / liver / celery (radish), etc** (6)

(b) COMPLETE  
& BALANCE: **2H<sub>2</sub>O<sub>2</sub> → 2H<sub>2</sub>O + O<sub>2</sub> / H<sub>2</sub>O<sub>2</sub> → H<sub>2</sub>O + ½O<sub>2</sub>**

PRODUCT: (3), BALANCING: (3)

(c) PLOT:



**axes correctly labelled with quantity or unit** (3)

**axes correctly scaled** (3)

**six points correctly plotted** (6)

**smooth curve correctly drawn through points and (0, 0)** (3)

[Allow (3) for 5 points correctly plotted.]

(d) FIND: **60 cm<sup>3</sup> [58 – 62 cm<sup>3</sup>]** (6)

[Allow (3) for correct reading of candidate's axes having shown horizontal and vertical lines meeting at 3 minutes if answer is outside range.]

[Allow (3) for extrapolation done well but y-axis read incorrectly.]

EXPLAIN: **rate decreases (slows down) with time / initial rate greatest / more reactant (hydrogen peroxide, H<sub>2</sub>O<sub>2</sub>) at start / rate proportional to concentration / reactant (hydrogen peroxide, H<sub>2</sub>O<sub>2</sub>) gets used up** (6)

(e) SKETCH: **curve of correct shape with initial rate less than original** (3)

**new curve of correct shape remains below or touches but doesn't cross first curve** (3)

[Second (3) only available if first (3) awarded.][Allow marks for both points for clear written answers.]

[Allow (3) for curve of poor shape that remains below or touches but doesn't cross first curve.][Straight line not acceptable.]



## Section B

### QUESTION 4

Eight items to be answered. Six marks to be allocated to each item and one additional mark to be added to each of the first two items for which the highest marks are awarded.

(a) WHAT: **solid, liquid, gas** (6)  
[Allow (3) for two correct states.]

(b) NAME: **Greece** (6)

(c) EXPLAIN: **diffusion / transfer of a substance from high concentration to low / gases expand on heating / gases fill available volume / convection currents, etc** (6)

(d) NAME: **bomb calorimeter** (6)  
[Allow (3) for 'bomb' on its own.]

(e) EXPLAIN: **reflux** (6)  
*or*  
**vapours rise up (evaporates) // condense (cool) / fall back into flask** (2 × 3)

(f) WHAT: **volume inversely // proportional to pressure** (2 × 3)  
*or*  
 **$P_1V_1 = \text{constant (k)} / P_1V_1 = P_2V_2 / P \propto \frac{1}{V}$**  (6)

(g) WHAT: **44.8 litres** (6)

<b>22.4</b> (3)
<b>× 2 = 44.8 litres</b> (3)

[Award (2) for 24 litres as molar volume.]

(h) WHAT: **half-life** (6)

(i) STATE: **to avoid algal bloom / to avoid eutrophication / to avoid scum / to avoid smelly water / to avoid fish kill / to avoid pollution of water, etc** (6)  
[Allow (3) for 'cleaning the water'.]

(j) WHICH: **benzene /**  (6)

(k) **A**  
GIVE: **heat conductivity / electrical conductivity / lustre (shine) / malleability / ductility** (3)  
ANY TWO: (2 × 3)

[Allow (3) for 'conductivity' alone, but once only.]

*or*

#### **B**

GIVE: **near coast / near water supply / near source of raw materials / near source of named raw material / near skilled workforce, etc** (3)

STATE: DROGHEDA: **magnesium oxide (refractory material, MgO) / ARKLOW: nitric acid (ammonium nitrate, fertilizers) / COBH: ammonia (urea, fertilizers)** (3)  
[GIVE and STATE must match TOWN to award second (3) marks.]

## QUESTION 5

(a) NAME: **Mendeleev** (5)

STATE: **same (similar) chemical properties / generally have same number of electrons in outer shell**

[Allow (3) for 'same (similar) physical properties'.]

(6)

(b) (i) IDENTIFY: **X = nitrogen / N**

**Y = oxygen / O**

**Z = fluorine / F**

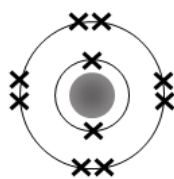
(3 × 3)

[Allow element identified as O<sub>2</sub>, N<sub>2</sub>, F<sub>2</sub>.]

(ii) WHAT: **19**

(3)

(iii) DRAW:



(3)

(iv) WHY: **it is a noble (inert) gas / stable electron arrangement (configuration) / eight electrons in outer shell / full outer shell / octet of electrons in outer shell / belongs to any correct group label**

(3)

(v) EXPLAIN: **nuclear charge increases / more protons (greater positive charge) / across periods of periodic table atomic radius decreases // no increase in screening**

(6 + 3)

(c) DEFINE: **relative (measure of) attraction / number expressing (giving) attraction // for shared electrons (pair) / for electrons in a covalent bond**

(2 × 3)

USE: **ionic**

(6)

[Z = **3.98 (4)**, Na = **0.93 (0.9)** / electronegativity difference **3.05 (3.1)** with no conclusion or incorrect conclusion (3)]

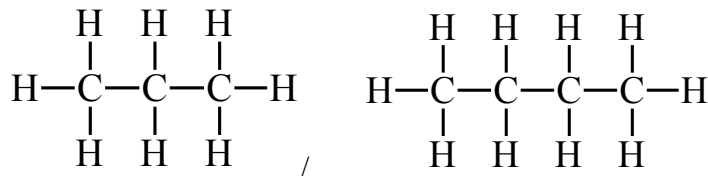
[If Z is incorrectly identified in b(i) apply consequential marking here.]

## QUESTION 6

(a) WHAT: compounds of **carbon and hydrogen** only (5)

(b) (i) NAME: **propane // butane** (6 + 3)  
[Accept C<sub>3</sub>H<sub>8</sub> and C<sub>4</sub>H<sub>10</sub>]

(ii) DRAW: **CH<sub>3</sub>CH<sub>2</sub>CH<sub>3</sub> / CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub> /**



(3)

(iii) WHY: **safety / to give it an odour (smell) / because LPG (it) has no odour (smell) / for easy detection / in case of a leak to enable detection** (6)

(c) WHAT: **tendency of fuel to resist pre-ignition (auto-ignition, knocking, pinking) / tendency of a fuel to pre-ignite (auto-ignite knock, pink)** (6)

GIVE: **isomerisation / catalytic cracking / dehydrocyclisation (reforming) / add lead / add oxygenate / add methanol (ethanol, MTBE, methyl *tert*-butyl ether) / use short chain molecules** (6)

(d) (i) NAME: **kerosene (kerosine, paraffin)** (9)

(ii) GIVE: **road making / roofing / tar / pitch / bitumen / waterproofing** (6)

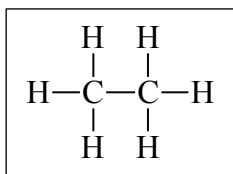
## QUESTION 7

- (a) DEFINE:
- (i) **loss of electrons //**  
[Allow increase in oxidation number.]
- (ii) **gain of electrons** (2 × 6)  
[Allow decrease in oxidation number.]
- (b) (i) WHICH: **zinc (Zn) oxidised**
- (ii) HOW MANY: loses **two** electrons (6 + 6)
- (iii) IDENTIFY: *oxidising reagent: Cu<sup>2+</sup> (copper sulfate, CuSO<sub>4</sub>) //*  
*reducing reagent: Zn* (2 × 3)
- (c) (i) WHY: **sodium is very reactive / fingers would cause sodium to become tarnished / sodium reacts with sweat / sodium burns skin / exothermic reaction / caustic**  
[Allow 'corrosive', 'irritant' but not 'dangerous'.] (6)
- (ii) WHAT: **sparks / yellow colour / flame / metal (sodium) melts / vigorous reaction / sodium whizzes around / sodium floats / hissing / fizzing / effervescence / popping / explosion / bang, etc** (6)
- (iii) NAME: **hydrogen** (6)
- (iv) WHAT: **reaction more vigorous (faster, more dangerous) / purple (lilac) flame observed / flames more readily** (2)  
[Allow flame for potassium in (iv) if (ii) has not referred to sodium flame.]

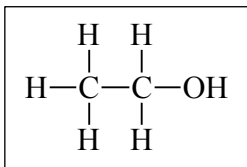
## QUESTION 8

(a) DRAW:

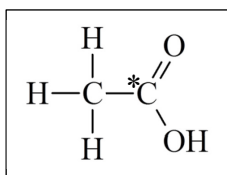
A



B



C



$((2 \times 6) + 3)$

MARK:

\*

(2)

(b) GIVE:

A = **ethane** //

B = **ethanol** //

C = **ethanoic acid**

$(6 + (2 \times 3))$

(c) WHICH:

**B / ethanol** //

**C / ethanoic acid**

$(2 \times 3)$

(d) CATEGORISE: (i) X = **substitution**

(ii) Y = **oxidation**

WHAT:

**uv (ultraviolet) light / sunlight**

[‘Heat’ on its own is not acceptable.]

$((2 \times 6) + 3)$

## QUESTION 9

- (a) WRITE:
- 1 a flocculating agent //
  - 2 sand and gravel //
  - 3 chlorine //
  - 4 fluorine //
  - 5 lime //
  - 6 plastic
- FIRST FIVE: (5 × 5)
- (b) (i) EXPLAIN: water that **cannot lather** easily **with soap** / water that **contains** dissolved **calcium (magnesium) ions** / water that **contains** dissolved **Ca<sup>2+</sup> (Mg<sup>2+</sup>)** / **water from a limestone area** (6)
- (ii) WHAT: **temporary / caused by** calcium or magnesium **hydrogen carbonate / removed by boiling (heating) //**  
**permanent / caused by sulfates (chlorides)** of calcium or magnesium / **unaffected by boiling (heating)** (2 × 3)
- (iii) WHICH: **temporary / caused by** calcium or magnesium **hydrogen carbonate / removed by boiling** (5)
- EXPLAIN: **heat (boiling) removes (precipitates) temporary hardness / heat (boiling) converts temporary hardness to scale (limescale)** (5)  
[Award marks once only for 'remove by boiling' in WHICH and EXPLAIN.]
- (iv) IDENTIFY: **carbon dioxide / CO<sub>2</sub>** (3)

**QUESTION 10:** Answer any **two** of the parts (a), (b) and (c).

(a) DESCRIBE: paper chromatography  
**apply mixture using dropper (capillary tube) / spotting on paper //**  
**about 2 cm (slightly, just) above (below\*) eluent\*\* //**  
**place paper in tank (beaker, other suitable container) //**  
**allow solvent to reach end of paper / allow time for separation** (6 + 3 + 3)

*or*

thin-layer chromatography  
**apply mixture using dropper (capillary tube) / spotting on plate //**  
**about 2 cm (slightly, just) above eluent\*\* //**  
**place plate in tank (beaker, other suitable container) //**  
**allow solvent to reach end of plate / allow time for separation** (6 + 3 + 3)

*or*

column chromatography  
**dissolve mixture in small volume of eluent\*\* / add mixture to column //**  
**add mixture to column / add eluent //**  
**keep adding eluent //**  
**allow components to reach end of column in turn / allow time for separation** (6 + 3 + 3)

[\*In paper chromatography the solvent reservoir could be higher than the paper in which case the mobile phase moves down the paper.]

[For eluent\*\* allow mobile phase, solvent or named solvent, e.g. water.]

[One diagram is sufficient; award maximum (9) marks if no diagram given.]

IDENTIFY: (i) **solvent (named solvent)** (3)

(ii) **paper / silica (alumina)** (3)

DESCRIBE: **separation of indicators / three individual spots or bands** not at original positions  
[These marks can be awarded for separation shown on diagram.]

EXPLAIN: **some indicators move faster than others** with mobile phase / **some indicators are held more strongly than others** on the stationary phase / **separation is evidence of selectivity of adsorbance (adsorption) / no separation the stationary phase would indicate no selective adsorbance (adsorption)**  
[These marks can only be awarded for explanation in words.] (4 + 3)

- (b) DEFINE: (i) **gives hydrogen (hydronium) ions ( $\text{H}^+$ ,  $\text{H}_3\text{O}^+$ ) in aqueous solution / proton (hydrogen ion,  $\text{H}^+$ ) donor //**  
(ii) **gives hydroxyl (hydroxide) ions ( $\text{OH}^-$ ) in aqueous solution / proton (hydrogen ion,  $\text{H}^+$ ) acceptor** (2 × 4)

DEFINE:  $-\log_{10} //$   
 $[\text{H}^+] / [\text{H}_3\text{O}^+]$  (2 × 3)

CALCULATE: **0.70 (0.69 – 0.70)** (6)

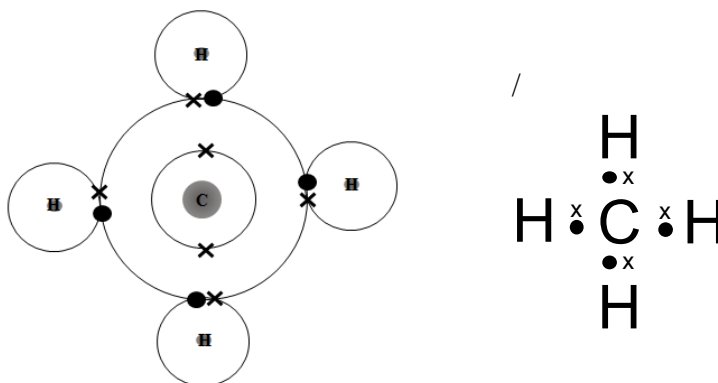
$\text{pH} = -\log 0.2 \quad (3)$ $= 0.70 (0.69 - 0.70) \quad (3)$
--

WHICH: **nitric acid** (3)

EXPLAIN: **sulfuric acid is dibasic (diprotic) / nitric acid is monobasic (monoprotic) / pH of 0.2 M sulfuric acid is 0.40 (0.39 – 0.40)** (2)

- (c) WHAT: **covalent / single / sigma** (4)

DRAW:



**4 valence carbon electrons //**

**4 hydrogen electrons //**

**four bond pairs**

[Diagram essential.][Non-valence electrons not required.]

(3 × 3)

STATE: **tetrahedral** (6)  
[Clear diagram acceptable.]

WOULD: **no //**

EXPLAIN: **non-polar / not attracted to polar water molecules / low electronegativity difference between carbon and hydrogen / covalent / hydrocarbon** (2 × 3)

[Accept 'like dissolves like' with no further explanation.]  
['Shared pair of electrons' not acceptable.]



**QUESTION 11:** Answer any **two** of the parts (a), (b) and (c).

(a) (i) EXPLAIN: **forward and reverse reactions // have equal rates** (4 + 3)

*or*

**concentrations of reactants and products // constant** (4 + 3)

(ii) HOW: **paler / less purple / pink** (3)

(iii) WRITE:  $K_c = \frac{[\text{HI}]^2}{[\text{H}_2][\text{I}_2]}$  (6)

(iv) COPY & COMPLETE: **oppose / reduce / counteract / relieve / minimize** (3)

PREDICT: **reaction goes (moves, shifts) to right (products side, HI side) / get more HI** (6)  
[Allow hydrogen (iodine) is used up.] [Allow colour fades.]

(b) (i) WHAT: **exothermic** (4)

(ii) PREDICT: **less heat given out per second / stays warm (lasts) longer / pellets react more slowly than powder / powder reacts faster than pellets / slower to heat up**

EXPLAIN: **pellets have smaller surface area than powder / powder has a greater surface area than pellets** (6 + 3)

(iii) HOW MANY: **0.5 moles Fe** (6)

$A_r = 56$	(3)
$n = \frac{m}{A_r} = \frac{28}{56} = 0.5 \text{ moles}$	(3)

HOW MANY: **0.25 moles Fe<sub>2</sub>O<sub>3</sub>** (6)

$\text{Fe} : \text{Fe}_2\text{O}_3 = 4 : 2 / 2 : 1 / 0.5 \div 2$	(3)
$= 0.25 \text{ moles Fe}_2\text{O}_3$	(3)

(c) Answer part A or part B.

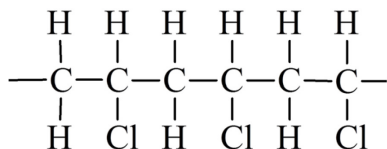
**A**

- (i) WHAT: **all reactants added at start / fixed time / short duration / fixed start time / definite amount of reactant / reaction vessel cleaned after each run / product removed at the end, etc**  
any two valid points (2 × 3)
- (ii) EXPLAIN: **second product / product made at same time as ethanol (wine) / byproduct / not the main product** (6)
- (iii) WHAT: **catalyst // produced by living cells / biological / protein** (2 × 3)
- (iv) GIVE: **unreactive (inert, stable) / doesn't corrode / easily cleaned / strong / can be heated** (7)

**B**

- (i) WHAT: monomers **join together** to make the polymer / **building blocks (small molecules)** that compose the polymer (4)

- (ii) GIVE:



**four or six (or a higher even number of) carbon atoms in a chain // single bonds between carbon atoms // chlorine to hydrogen ratio 1 : 3**

(3 × 3)

- (iii) WHY: **plastic unreactive (stable, inert, usually not biodegradable) / lasts a long time in environment if discarded / derived from non-renewable crude oil (source) / to cut down waste / to avoid pollution / to preserve natural resources, etc** (6)
- (iv) WHAT: **melting / extrusion / remoulding** (6)

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