

FOR OFFICIAL USE

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Total
Marks

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0500/401NATIONAL
QUALIFICATIONS
2003FRIDAY, 23 MAY
9.00 AM - 10.30 AMCHEMISTRY
STANDARD GRADE
General Level

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Date of birth

Day Month Year

| | | | | | | | |
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Scottish candidate number

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Number of seat

- All questions should be attempted.
- Necessary data will be found in the Data Booklet provided for Chemistry at Standard Grade and Intermediate 2.
- The questions may be answered in any order but all answers are to be written in this answer book, and must be written clearly and legibly in ink.
- Rough work, if any should be necessary, as well as the fair copy, is to be written in this book.
Rough work should be scored through when the fair copy has been written.
- Additional space for answers and rough work will be found at the end of the book.
- The size of the space provided for an answer should not be taken as an indication of how much to write. It is not necessary to use all the space.
- Before leaving the examination room you must give this book to the invigilator. If you do not, you may lose all the marks for this paper.



4. The grid contains the names of some chemical reactions and processes.

| | | | | | |
|---|------------|---|----------------|---|----------------|
| A | combustion | B | neutralisation | C | polymerisation |
| D | addition | E | cracking | F | electrolysis |

- (a) Identify the chemical reaction in which oxygen is used up.

| | | |
|---|---|---|
| A | B | C |
| D | E | F |

- (b) Identify the process in which a compound is broken down by electricity.

| | | |
|---|---|---|
| A | B | C |
| D | E | F |

- (c) Identify the chemical reaction in which glucose molecules join together to form starch.

| | | |
|---|---|---|
| A | B | C |
| D | E | F |

5. Many solutions are used for chemical tests.

| | | |
|------------------|--------------------|--------------|
| A | B | C |
| iodine solution | Benedict's reagent | lime water |
| D | E | F |
| bromine solution | ferroxyl indicator | pH indicator |

- (a) Identify the solution which is used to test for glucose.

| | | |
|---|---|---|
| A | B | C |
| D | E | F |

- (b) Identify the solution which is used to test for $\text{Fe}^{2+}(\text{aq})$.

| | | |
|---|---|---|
| A | B | C |
| D | E | F |

- (c) Identify the solution which is used to test for a carbon to carbon double bond.

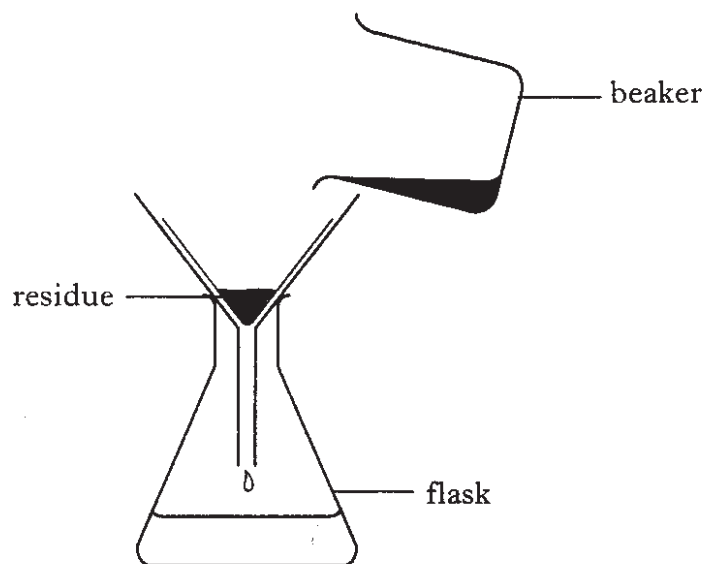
| | | |
|---|---|---|
| A | B | C |
| D | E | F |

[Turn over

7. **Excess** copper carbonate was added to dilute hydrochloric acid in a beaker.



When the reaction had finished the contents of the beaker were filtered.



| | |
|---|--------------------------------------|
| A | copper carbonate (CuCO_3) |
| B | hydrochloric acid (HCl) |
| C | copper chloride (CuCl_2) |
| D | carbon dioxide (CO_2) |
| E | water (H_2O) |

- (a) Identify the residue.

| |
|---|
| A |
| B |
| C |
| D |
| E |

- (b) Identify the substance(s) which collected in the flask.

| |
|---|
| A |
| B |
| C |
| D |
| E |

Marks

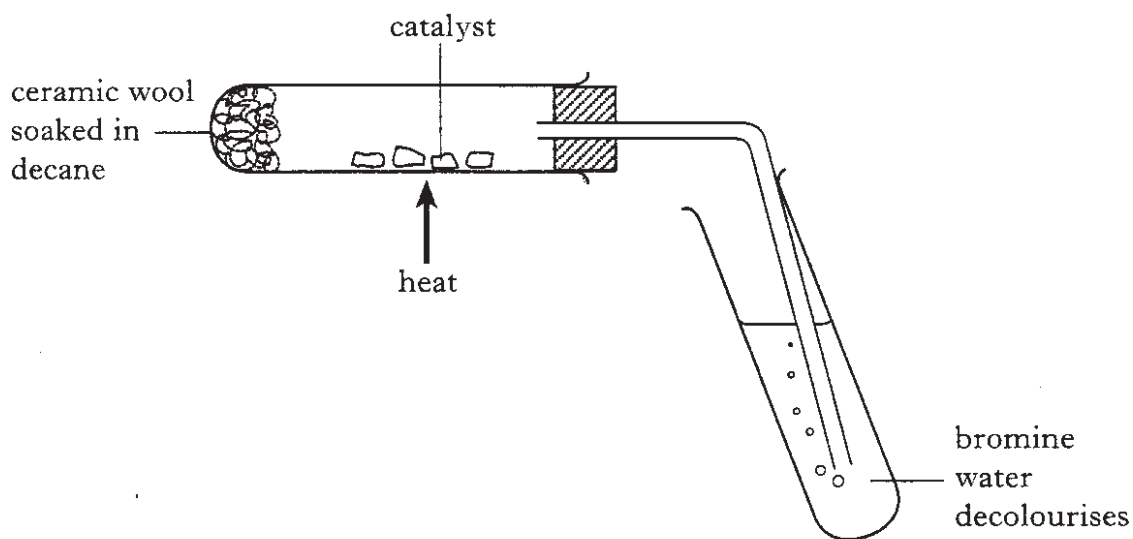
KU PS

10. (continued)

- (b) Decane is a compound found in the kerosene fraction.
To which family of hydrocarbons does decane belong?

1

- (c) Decane can be broken down into a mixture of saturated and unsaturated hydrocarbons.



- (i) What is meant by a **saturated** hydrocarbon?

1

- (ii) Decane can break down in the following way:



Write down the molecular formula for **X**.

1

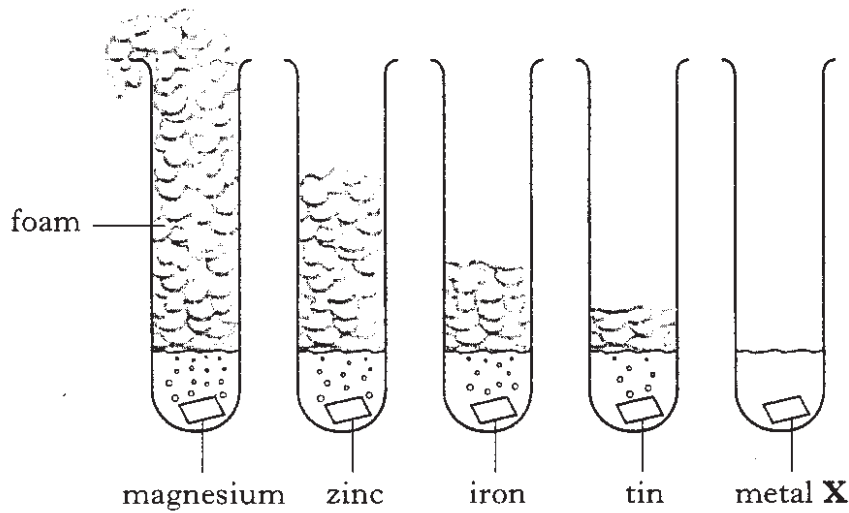
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14. The reactivity of metals can be compared by adding them to a mixture of hydrochloric acid and detergent.

Amy set up five test tubes each containing a different metal.



- (a) Name the gas produced when a metal reacts with hydrochloric acid.

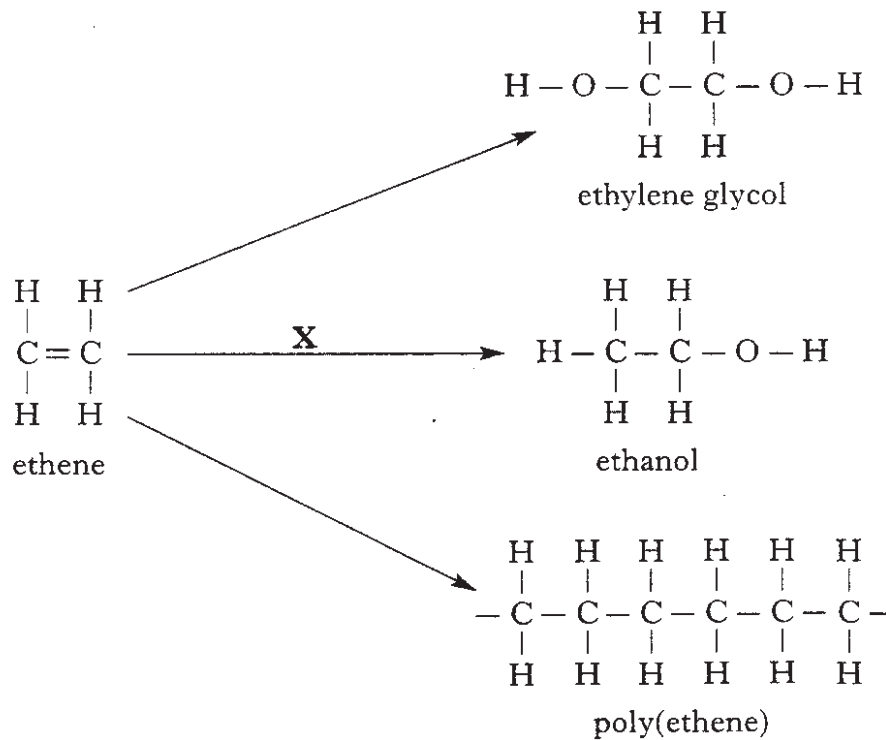
- (b) Suggest a name for metal X.
You may wish to use page 7 of the data booklet.

- (c) Name one factor which Amy would have kept the same to ensure a fair comparison.

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| | | |
| 1 | | |
| 1 | | |
| 1 | | |
| (3) | | |

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15. Ethene is used to make a variety of products. Some of these are shown below.



(a) Write the molecular formula for ethylene glycol.

1

(b) Name substance X.

1

(c) Poly(ethene) is a **synthetic** polymer. What does **synthetic** mean?

1

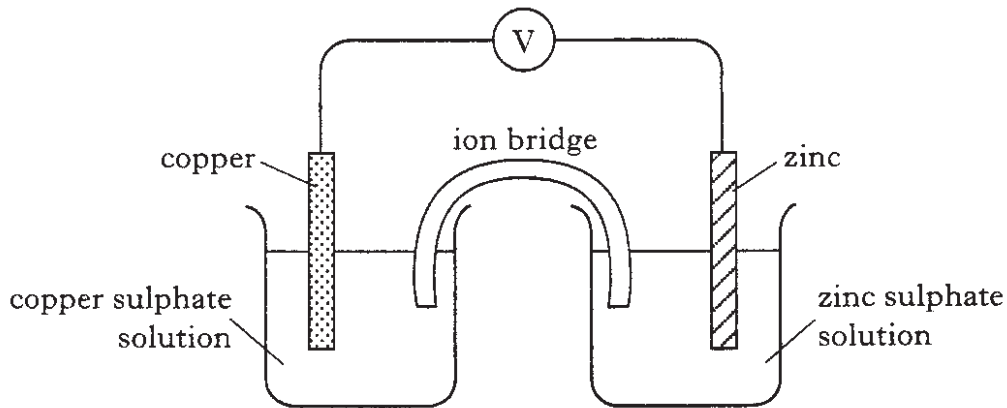
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KU PS

17. The diagram shows a copper/zinc cell.



(a) In the cell, the electricity flows through the wires from the zinc to the copper.

Name the type of charged particle that flows through the **wires**.

1

(b) What is the purpose of the ion bridge?

1

(c) Eventually the cell would stop producing electricity.

Give a reason for this.

1

(d) Name a metal which could replace zinc to produce a larger voltage.

You may wish to use page 7 of the data booklet.

1

(4)

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| 18. | | |
| (a) | | |
| 1 | | |
| (b) | | |
| (i) | | |
| 2 | | |
| (ii) | | |
| 1 | | |
| (4) | | |

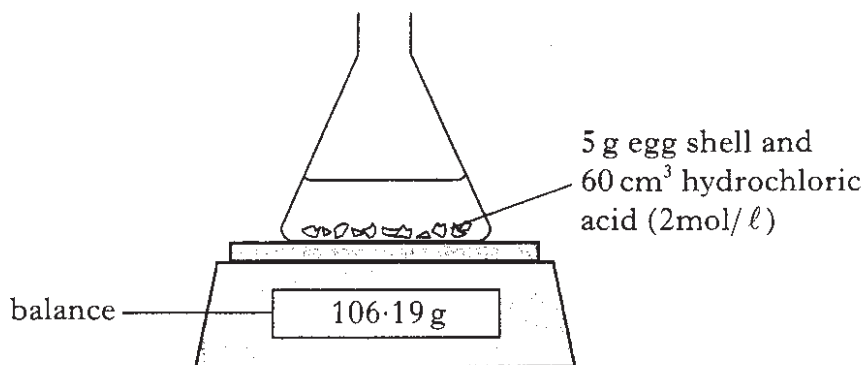
18. Egg shells and sea shells contain calcium carbonate.

Calcium carbonate reacts with dilute hydrochloric acid to produce carbon dioxide gas.

(a) State the test for carbon dioxide.

(b) Adam wanted to find out which type of shell contained the most calcium carbonate.

He set up the experiment shown below.



(i) State **two** ways in which Adam would know when the reaction had finished.

(ii) Adam repeated the experiment using 5 g sea shell. His results are shown in the table.

| | Sea shell | Egg shell |
|----------------------------|-----------|-----------|
| Balance reading at start/g | 106.19 | 106.19 |
| Balance reading at end/g | 104.22 | 104.01 |

Which type of shell contained the most calcium carbonate?
