



UNIVERSITY *of* CAMBRIDGE
International Examinations

Script B
Without Marks

Chemistry
0620/02

June 2003



UNIVERSITY *of* CAMBRIDGE
Local Examinations Syndicate

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CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CHEMISTRY

0620/02

Paper 2

May/June 2003

1 hour

Candidates answer on the Question Paper.
No Additional Materials required

READ THESE INSTRUCTIONS FIRST

Write your name, centre number and candidate number in the spaces provided at the top of this page.
Write in dark blue or black pen in the spaces provided on the Question Paper.
You may use a pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

The number of marks is given in brackets [] at the end of each question or part question.
A copy of the Periodic Table is printed on page 16.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

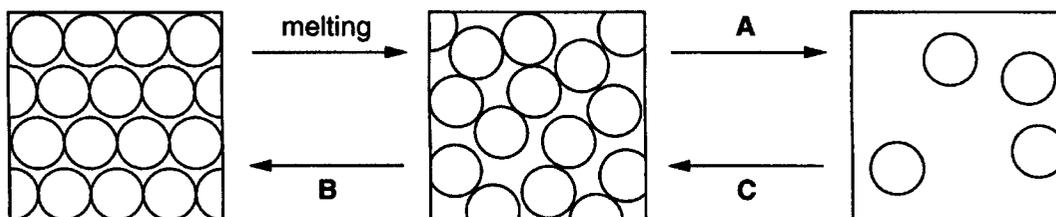
FOR EXAMINER'S USE

| | |
|--------------|--|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| TOTAL | |

This document consists of 16 printed pages.



- 3 The states of matter are solid, liquid and gas.
The diagram below shows how the molecules are arranged in these three states.



- (a) State the name given to the change of state labelled

(i) A *Evaporation*

(ii) B *Freezing*

(iii) C

[3]

- (b) Which one of the following best describes the movement of molecules in the liquid state?

Tick **one** box.

The molecules are not moving from place to place.

The molecules are sliding over each other.

The molecules are moving freely.

[1]

- (c) Which of the changes A, B or C, is endothermic?
Explain your answer.

A
.....
..... *because endothermic heat is given out* [2]

(d) Choose from the following list of substances to answer the questions below.

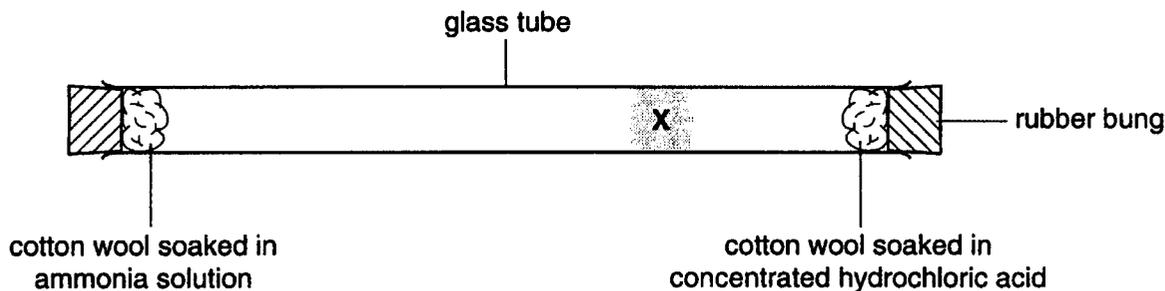
bromine
chlorine
iron
mercury
sodium chloride
sulphur

Name a substance which is

- (i) a gas at room temperature. Sulphur
- (ii) a non-metallic liquid at room temperature. Chlorine
- (iii) a compound which is a solid at room temperature. Sodium Chloride

[3]

(e) A student set up the apparatus shown in the diagram below.



The white solid is formed because the molecules of hydrogen chloride gas and ammonia gas move at random throughout the tube and eventually react with each other.

(i) State the name given to this random movement of molecules.

..... *br* gas

(ii) State the name of the white solid formed at X.

..... ~~ammonia gas~~ Ammonium

(iii) Suggest why the white solid is formed towards one end of the tube and not in the middle.

..... because Ammonia more reactive than HCl

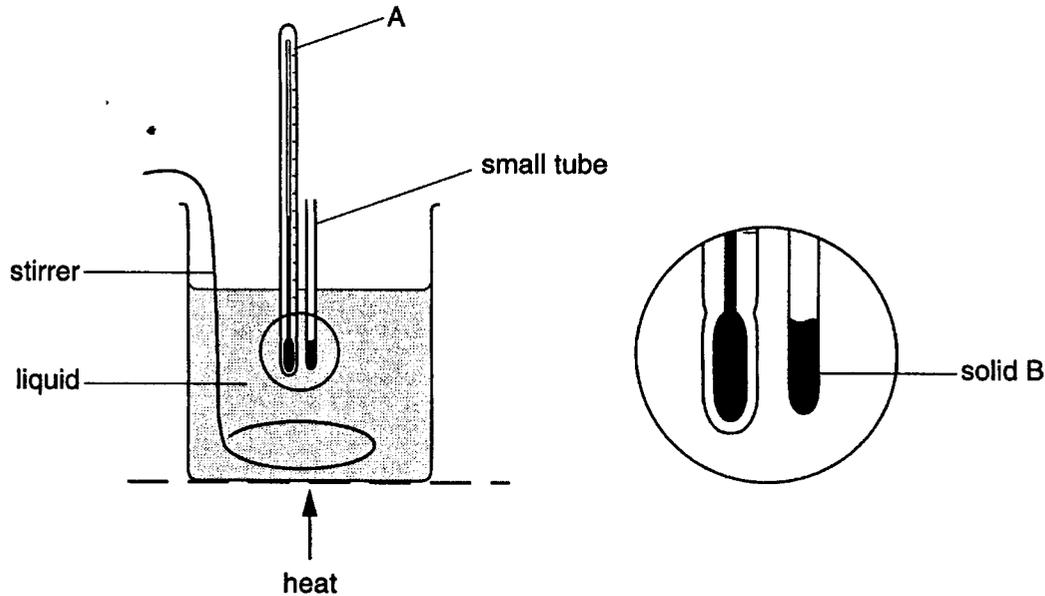
..... [3]

(f) What type of chemical reaction takes place when ammonia reacts with hydrochloric acid?

..... Addition

..... [1]

- (g) The diagram below shows a simple apparatus that can be used for measuring the melting point of a solid. The liquid in the beaker is heated slowly and the temperature at which the solid B melts is recorded.



- (i) State the name of the piece of apparatus labelled A.

Temperature meter

- (ii) Solid B melted at 155°C .

Why would water **not** be a suitable liquid to put in the beaker when using this apparatus to find the melting point of solid B?

because the boiling point of water is 100°C

which is below the melting point of solid B, therefore solid B can't be melt

- (iii) Suggest why the liquid needs to be kept stirred.

because if not the liquids will be boiled faster and blow-up

not evaporate.

[3]

- 6 This question is about different metals.

The list below shows part of the metal reactivity series .

| | |
|-----------|---------------|
| potassium | more reactive |
| magnesium | |
| aluminium | |
| zinc | |
| iron | |
| copper | less reactive |

- (a) From this list, choose a metal which is extracted using electrolysis.

.....Copper.....[1]

- (b) Two thousand years ago, people were able to extract iron and copper from their ores. They were not able to extract aluminium.

Suggest why they were not able to extract aluminium from its ore.

.....because Aluminium is more reactive.....[1]

- (c) Uranium is between magnesium and zinc in the reactivity series.

Equal sized strips of magnesium, uranium and zinc were placed in hydrochloric acid. The hydrochloric acid was the same concentration. The results are shown in the table.

- (i) Complete the result for uranium and hydrochloric acid.

| metal | observations on adding to hydrochloric acid |
|-----------|---|
| magnesium | many bubbles of gas produced very rapidly and magnesium dissolves quickly |
| uranium | bubbles of gas produced rapidly and uranium dissolves |
| zinc | a few bubbles produced at a steady rate and zinc dissolves slowly |

- (ii) Uranium has several isotopes which are radioactive. One of these isotopes is uranium – 235 (^{235}U).

What do you understand by the term *isotopes*?

.....atoms with same proton number but different ^{relative atomic} ~~mass~~ number.....

- (iii) State one use of uranium –235.

.....main source of energy.....[3]

- (d) Metals high in the reactivity series react readily with oxygen.
Name the compound formed when magnesium reacts with oxygen.

Magnesium Oxide[1]

- (e) Copper is alloyed with tin to make bronze.

- (i) State what is meant by the term alloy.

Alloy : is a substance that is used as a layer to slow down
corrosion

- (ii) Suggest why metals are often used in the form of alloys.

because metals is very ~~hard~~ hard to get rusted (corrode)
.....
.....[2]

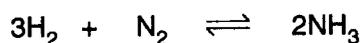
- (f) Zinc can be extracted by heating zinc oxide with carbon.



Explain why carbon is a reducing agent (reductant) in this reaction.

because it is being oxidise as it gained oxygen
.....
.....[1]

- (g) Iron is used as a catalyst in the Haber Process for making ammonia.



- (i) What does the sign \rightleftharpoons mean?

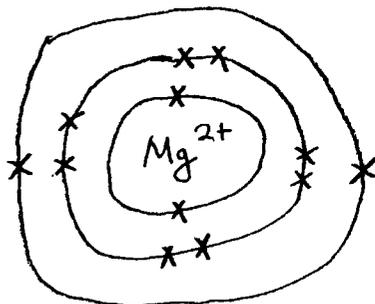
it means the equation can be reversible

- (ii) What is the approximate percentage of nitrogen in the air?

79%[2]

(h) Magnesium is in group II of the Periodic Table.

(i) Draw a diagram to show the electronic structure of magnesium.



(ii) Explain what happens to the magnesium atom when it reacts and forms a magnesium ion.

..... *its gains 2 electrons* [3]

