



UNIVERSITY *of* CAMBRIDGE
International Examinations

Script F
Without Marks

Chemistry
0620/06

June 2002



UNIVERSITY *of* CAMBRIDGE
Local Examinations Syndicate

Centre Number

Candidate
Number

Candidate Name

**International General Certificate of Secondary Education
CAMBRIDGE INTERNATIONAL EXAMINATIONS**

CHEMISTRY

0620/6

PAPER 6 Alternative to Practical

MAY/JUNE SESSION 2002

1 hour

Candidates answer on the question paper.
No additional materials are required.

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

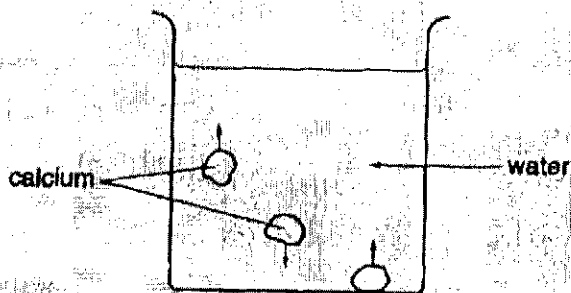
INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.

FOR EXAMINER'S USE

This question paper consists of 11 printed pages and 1 blank page.

- 4 Small pieces of calcium are added to a beaker of cold water. The pieces of calcium move up and down.



- (a) Give one other observation expected in this reaction.

Efferescence [1]

- (b) Suggest why the pieces of calcium move up and down.

It is reacting with the water [1]

- (c) Suggest a value for the pH of the solution formed.

9 [1]

- 5 A student investigated the redox reaction between potassium manganate(VII) and iron(II) ions. Two different aqueous solutions of potassium manganate(VII), A and B, were used.

Experiment 1

A burette was filled to the 0.0 cm³ mark with the solution A of aqueous potassium manganate(VII). A 25 cm³ sample of aqueous iron(II) ions was added into a conical flask from a measuring cylinder.

Solution A was gradually added until there was just a permanent pale pink colour in the contents of the flask.

Use the burette diagram to read the volume added and record the volume in the table.

Experiment 2


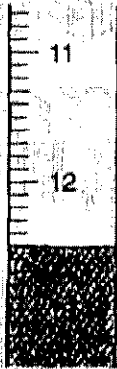
Experiment 1 was repeated using the solution B of potassium manganate(VII) instead of solution A.

Use the burette diagram to read the volume added and complete the table.

A little of the contents of the flask were poured into a test-tube. Excess aqueous sodium hydroxide was added to the tube.

A red-brown precipitate was formed.

Table of results

Burette readings/cm ³		
	Experiment 1	Experiment 2
Final reading	 23.9	 11.5
Initial reading	0.0	0.0
Difference	23.9 - 0.0 = 23.9	11.5 - 0.0 = 11.5

- (a) (i) In which Experiment was the greatest volume of aqueous potassium manganate(VII) used?

In experiment 2 [1]

- (ii) Compare the volumes of potassium manganate(VII) used in Experiments 1 and 2.

The volume of potassium manganate (VII) used in experiment 1 was 0.1 cm^3 compared to the 12.5 cm^3 used in experiment 2. [2]

- (iii) Suggest an explanation for the difference in the volumes.

The 2.5 cm^3 sample of aqueous iron (II) ions had less iron (II) ions in the first experiment than in the second. [1]

- (iv) Predict the volume of solution B which would be needed to completely react with 50 cm^3 of the solution of Iron(II) ions.

$12.5 \times 2 = 25 \text{ cm}^3$ [2]

- (b) What product is formed in the flask at the end of the reaction? Give a reason for your answer.

product Iron manganate (VII) [1]

reason The iron ions displaced the potassium manganate [2]

- (c) Explain one change you could make to the apparatus used in the experiments to obtain more accurate results.

change Bigger scaled apparatus can be used [1]

explanation The margin of error would be smaller [2]