

2008-CE

CHEM

PAPER 1



HONG KONG CERTIFICATE OF EDUCATION MOCK EXAMINATION 2008

CHEMISTRY PAPER 1

by Rick Lam

(1 3/4 hours)

This paper must be answered in English.

Instructions

1. Write your Candidate Number, Centre Number and Seat Number in the spaces provided on this cover.
2. This paper consists of Two sections, A and B. Section A carries 58 marks and Section B carries 38 marks.
3. Attempt ALL questions in each section. Write your answers in the spaces provided in this Question-Answer Book. Supplementary answer sheets will be provided on request. Write your Candidate Number on each supplementary answer sheet and fasten them with a string inside this book.
4. A periodic Table is printed on the back of this Question-Answer Book. Atomic numbers and relative atomic masses of elements can be obtained from the Periodic Table.

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Candidate Number						
Centre Number						
Seat Number						

Section A Question No.	Marker's Use Only	Examiner's Use Only
	Marker No.	Examiner No.
1		
2		
3		
4		
5		
6		
7		
8		
Total		

Checker's Use Only	Section A Total		
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Section A Question No.	Marks	Marks
9		
10		
11		
12		
Total		

Checker's Use Only	Section B Total		
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Checker No.	
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Section A (Answer ALL questions.)

1. Burning of fuels in factories and motor cars produces many air pollutants.

Sulphur dioxide is usually found in exhaust fumes from factories.

(a) Explain, with the help of an equation, why sulphur dioxide is produced in factories.

(b) Explain how sulphur dioxide affects

(i) our health;

(ii) the growth of plants.

(c) In Hong Kong, does the car exhaust contain a large amount of sulphur dioxide? Explain briefly.

(6 marks)

2. The following table shows some information about A, B, C, D, E, F and G which represent particles of some elements.

Particle	Number of protons	Number of neutrons	Number of electrons
A	7	7	7
B	11	12	11
C	14	14	14
D	11	12	10
E	2	2	2
F	9	10	9
G	12	12	12

(a) What is the relationship between B and D?

(b) Explain which particle(s) is/are chemically inert.

- (c) (i) Draw the electron diagrams of the compounds formed between
(I) A and G; (II) C and F. (showing electrons in the outermost shells only)

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- (ii) Which of these two compounds has a higher melting point? Explain briefly.

(7 marks)

3. A student tried to prepare magnesium oxide from magnesium and steam. He was given a boiling tube, a delivery tube, some sand, a stopcork with a hole, 5 g magnesium ribbon and water.

(a) Draw the experimental set-up for the reaction.

(b) State ONE observation in the reaction. Write the chemical equation for the reaction.

(c) Assuming that all the magnesium ribbon was converted to magnesium oxide.

(i) Calculate the theoretical mass of magnesium oxide obtained.

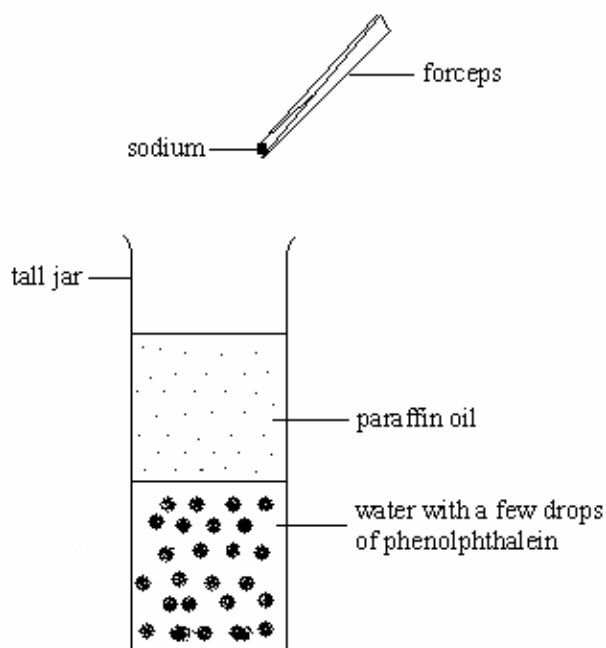
(ii) The actual mass of magnesium oxide obtained was 7.68 g

(I) Give ONE reason for the difference between the theoretical mass and the actual mass.

(II) Calculate the percentage yield of the reaction.

(8 marks)

4. A teacher prepared the following set-up for an experiment. He asked a student to predict the observations.



The following are the student's predictions:

1. Sodium sinks in paraffin oil.
2. Sodium catches fire when it is in contact with water and golden yellow flame is observed.
3. Moreover, a gas is released when sodium reacts with water. It provides an upward force to carry the sodium to the surface of paraffin oil.
4. Phenomenon 1 to 3 repeat continuously.

(a) Explain why sodium sinks in paraffin oil.

(b) Write the equation for the reaction between sodium and water.

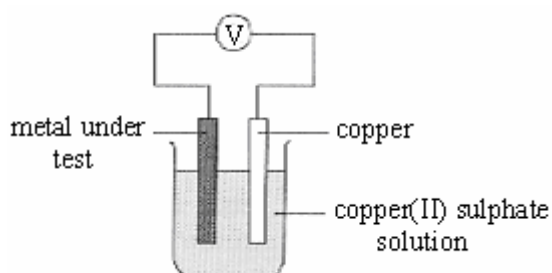
(c) There is a mistake in the student's predictions. What is it? Explain briefly.

(d) Why does sodium sink again after it is carried to the surface of paraffin oil by the gas given out?

(e) Why does the colour of the water turn pink slowly?

(6 marks)

5. The following set-up is used to compare the reactivity of five metals: W, X, Y, Z and copper. The voltage in each case is recorded by a voltmeter. When metal W is connected to copper, electrons flow from metal W to copper.



Metal under test	W	X	Y	Z
Voltage(V)	+1.20	+1.95	-0.76	+0.66

- (a) Arrange the metals, W, X, Y, Z and copper in order of decreasing reactivity. Explain your answer briefly.

- (b) The voltage of the cells in this experiment may drop rapidly after use. Suggest an improvement for the set-up in order to avoid this.

(5 marks)

6. The oxidation number of iron in its compounds can be +2 or +3.

(a) (i) What will happen if sodium hydroxide solution is added into iron(III) nitrate solution?

(ii) Is the reaction a redox reaction? Explain briefly.

(b) Iron(II) nitrate solution and iron(III) nitrate solution are mixed with acidified potassium permanganate solution separately.

(i) Suggest an acid to acidify potassium permanganate solution.

(ii) Determine whether the nitrate solutions undergo reaction with the acidified potassium permanganate solution. If yes, write the equation(s) involved.

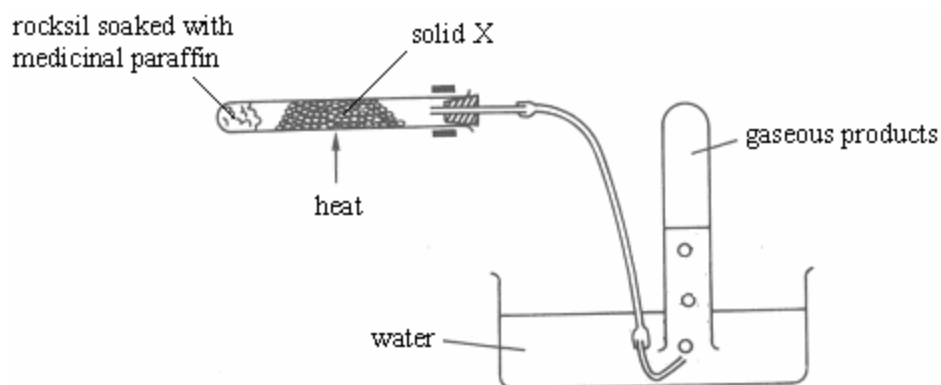
(c) When a magnesium ribbon is added into iron(II) nitrate solution, a redox reaction occurs.

(i) Give the ionic equation for this reaction.

(ii) Explain whether iron(II) nitrate acts as a reducing agent or an oxidizing agent in this reaction.

(8 marks)

10. A student tried to break down a sample of medicinal paraffin (cracking) with the set-up below.



(a) (i) What may solid X be?

(ii) What is the function of solid X?

(b) Why was not the rocksil heated directly?

(c) The student found that there was a layer of oily liquid on the surface of the water. Suggest what this oily liquid might be.

(d) The student passed the gaseous products collected into bromine water. The bromine water was decolourized immediately.

(i) What can you comment on the gaseous products?

(ii) Name the type of reaction between the gaseous products and bromine water.

(e) After the experiment, the student tried to remove the heat source before the delivery tube was disconnected. However, his teacher did not allow him to do so.

(i) Explain why the teacher did that.

(ii) What should the student do instead?

(f) Suggest two reasons to explain why cracking is an important process.

(9 marks)

