

ST. GREGORIOS HIGH SCHOOL
PRELIMINARY EXAMINATION, DEC 2007 – JAN 2008

STD X

CHEMISTRY

80 MARKS

TIME: 1½ HOURS

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Note: The first 15 mins are for reading only. No writing work to be done during this time. The writing time of 1½ hrs is excluding this time. All questions from Section I are compulsory. Attempt any four from Section II.

SECTION I

Q. 1. (a) Complete the following statements by selecting the proper alternative from those given after each statement:

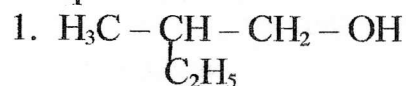
1. The final product of catalytic oxidation of ethane is _____.
(ethanol, acetic acid, acetaldehyde)
2. A solution of _____ is an electrolyte. (urea, common salt, distilled water)
3. _____ is liberated when iron reacts with dilute nitric acid. (nitric oxide, nitrogen dioxide, nitrous oxide)
4. When hydrogen sulphide is passed through acidified solution of potassium permanganate, the solution turns _____. (orange, green, colourless)
5. _____ ore is concentrated by the Froth Floatation process.
(Haematite, bauxite, zinc blende) [5]

(b) (i) 500 ml of a gas X at STP weighs 1.35g. Calculate the vapour density and molecular weight of the gas. (1 litre of hydrogen at STP weighs 0.09g) [3]

(ii) Draw the electron dot structures for:

1. Ammonium ion
2. Hydronium ion [2]

(c) (i) State the IUPAC names and the functional group of the following compounds:

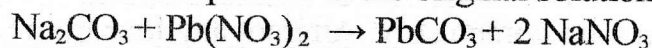


(ii) Draw the structures of the following organic compounds:

- 2,2,4,4 tetra bromo pentane
- 2 - methyl butanal

[2]

(d) (i) When excess of lead nitrate solution was added to a solution of sodium carbonate 5.34g of lead carbonate was precipitated. What mass of sodium carbonate was present in the original solution?



(N = 14, C = 12, O = 16, Na = 23, Pb = 207)

[3]

(ii) Give two differences between the flow of electricity through Nickel and through Nickel sulphate solution.

[2]

(e) Choose the letter corresponding to the correct answer from the choices given below:

- The percentage of Carbon is 0.5 – 1.5 in _____. (Mild steel / wrought iron / hard steel)
- Stainless steel does not contain _____. (Nickel / chromium / tungsten)
- The metal that does not conduct electricity is _____. (Tungsten / zinc / copper)
- _____ cannot be cut by a knife. (Sodium / potassium / zinc)
- _____ shows lustre. (Sulphur / phosphorus / iodine)

[5]

(f) What would you observe in the following cases?

- Sodium metal is added to methanol.
- A jar containing ammonia gas is inverted over a trough full of water.
- Phosphorus reacts with concentrated nitric acid.
- Ammonium hydroxide is added in excess to a solution of zinc chloride.
- Ammonia is oxidized in the presence of a catalyst.

[5]

(g) (i) Give the chemical test to distinguish between potassium carbonate and potassium sulphite.

[2]

(ii) Explain the following terms:

- Normal salt
- Relative atomic mass.
- Amalgam

[3]

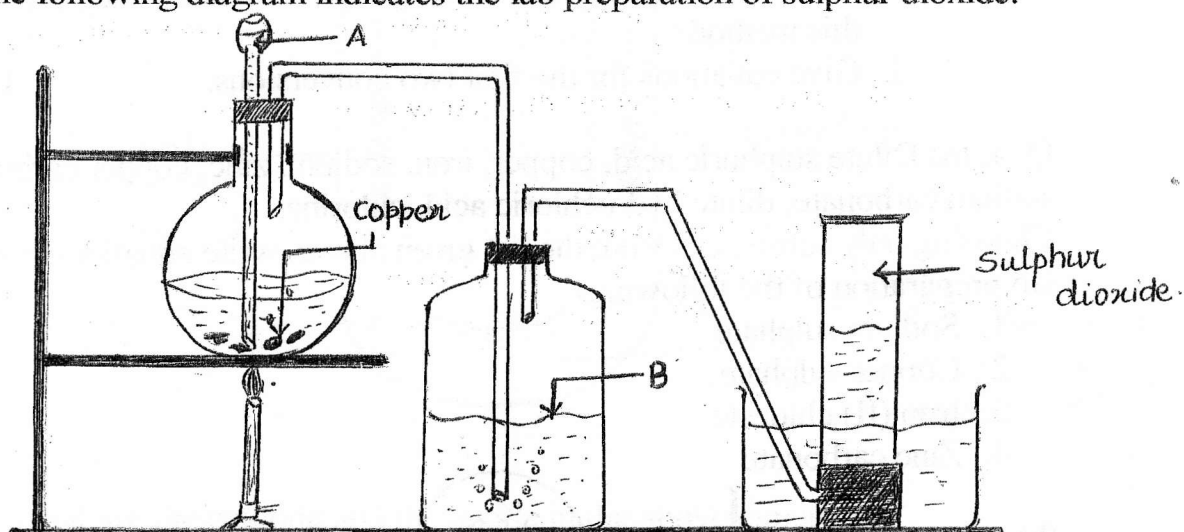
(h) Elements A, B, C and D are in the same period of the periodic table. Allot them their correct groups on the basis of the following properties:

- An oxide of A is A_2O , which is strongly basic.
- B forms a covalent chloride BCl_3 .
- Oxide of C is C_2O_3 , which is amphoteric.
- D is an ion D^-
- What is the formula of the compounds formed by A and D? [5]

SECTION II

Q. 2. (a) A compound has the following percentage composition: C = 57.82%, O = 38.58% and the rest was hydrogen. Its vapour density is 83. Find its empirical and molecular formula. [5]

(b) The following diagram indicates the lab preparation of sulphur dioxide.



- What is the mistake in the above diagram? Support your answer with a reason.
- Label A and B.
- What is the purpose of B?
- Give the balanced equation for the above reaction. [5]

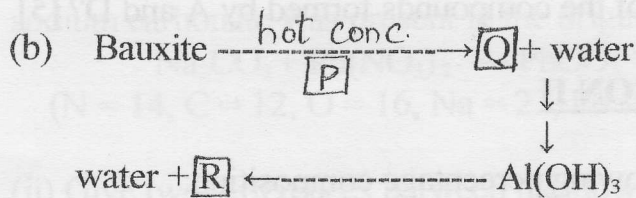
Q. 3. (a) Three colourless acids A, B and C are given.

- Concentrated C when treated with cane sugar, leaves a spongy mass, whereas concentrated A & B have no effect on cane sugar.
- Dilute A and B were added separately to silver nitrate solution. A gave a white precipitate while B showed no change.

c. Concentrated A and B when mixed in the ratio 3:1 form a solution that dissolves gold.

1. Identify A, B and C.
2. Give equations for the reactions between
 - (i) C and cane sugar
 - (ii) A and silver nitrate

[5]



1. Identify P, Q & R.
2. What is the temperature required for the final conversion?
3. What is the name of the above process? What is the purpose of this method?
4. Give equations for the first two conversions.

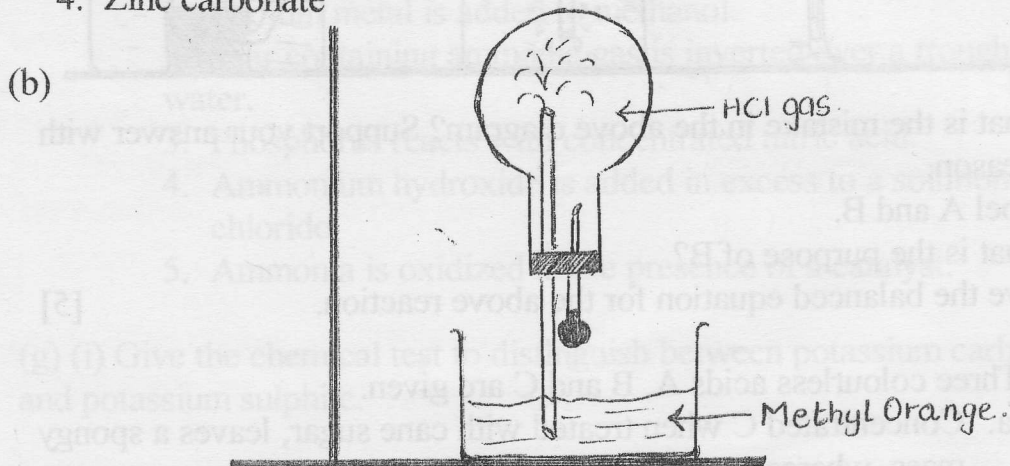
[5]

Q. 4. (a) Dilute sulphuric acid, copper, iron, sodium, zinc, copper carbonate, sodium carbonate, dilute hydrochloric acid, chlorine.

Choosing only substances from the list given above, write equations for the lab preparation of the following:

1. Sodium sulphate
2. Copper sulphate
3. Iron (II) chloride
4. Zinc carbonate

[4]

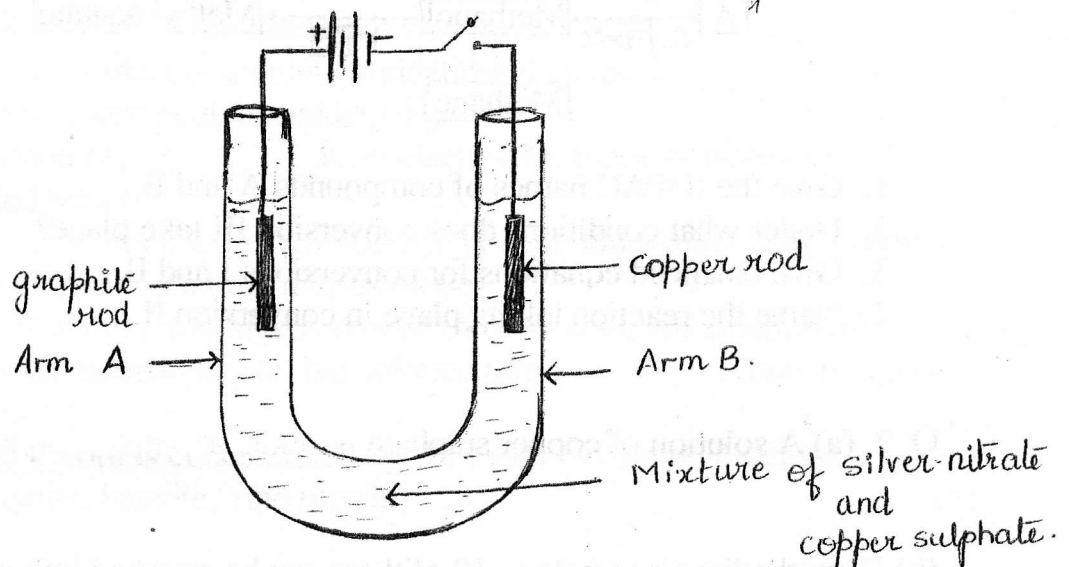


1. Name the above experiment.
2. Which property of HCl is demonstrated by this experiment?
3. State the colour of the solution that has entered the round bottom flask? [3]

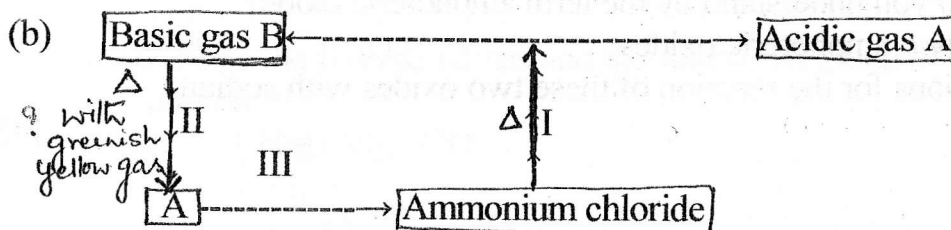
(c) Rewrite the following statements with the missing conditions. Underline the added word/words.

1. When ethyne is passed through cuprous chloride solution, a red precipitate is obtained.
2. A white precipitate of lead hydroxide is soluble in sodium hydroxide solution.
3. Sulphur dioxide bleaches coloured petals. [3]

Q. 5. (a) In the U-tube given below a mixture of silver nitrate and copper sulphate solution is taken. Observe the diagram and answer the following questions:



1. What are the cathode and the anode in the above experiment?
2. Name the product formed at the graphite rod.
3. After sometime the colour of solution in arm A becomes colourless while in arm B it turns blue. Explain.
4. Give the reactions taking place at the cathode and the anode. [5]

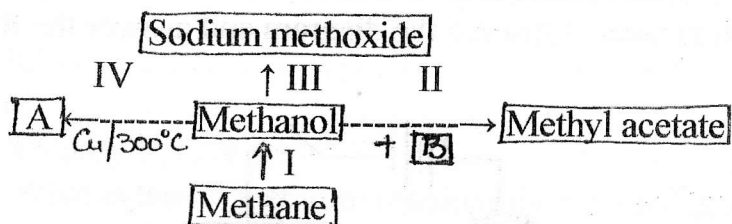


1. Name A and B
2. Give equations for the conversions I, II and III. [5]

Q. 6. (a) Nitric acid is added to certain elements. Copy and complete the table. [5]

Element	Condition	Gases evolved
	Conc. Nitric acid	Carbon dioxide
Copper	Dilute nitric acid	
		Hydrogen
Sulphur	Conc. Nitric acid	

(b)



1. Give the IUPAC names of compounds A and B.
2. Under what conditions does conversion III take place?
3. Give balanced equations for conversions I and II.
4. Name the reaction taking place in conversion II.

[5]

Q. 7. (a) A solution of copper sulphate is acidic in nature. Explain why? [2]

(b) From the list given below, 10 of them can be matched into pairs. One has been done for you as an example. Write out four other matching pairs.
 Ferric chloride solution, Contact process, methane, ammonia, nitric acid, lead acetate paper, Nessler's reagent, brown ring test, reddish brown precipitate, urotropine, marsh gas, hydrogen sulphide.
 Eg. Nitric acid – brown ring test.

[4]

- (c) 1. What do you understand by the term amphoteric oxide?
2. Name any two amphoteric oxides.
3. Give equations for the reaction of these two oxides with sodium hydroxide.

[4]