ICSE Chemistry: Model Paper 13

Answers to this Paper must be written on the paper provided separately.
You will not be allowed to write during the first 15 minutes.
This time is to be spent in reading the Question Paper.
The time given at the head of this paper is the time allowed for writing the answers.

Section I is compulsory. Attempt any four questions from Section II.
The intended marks for questions or parts of questions are given in brackets [ ].

SECTION I (40 Marks)
*Attempt **all** questions from this Section*

Q 3 (a)Write equations for the following reactions:
(i) burning of ammonia in oxygen;
(ii) catalytic oxidation of ammonia.

Q 3 (b)(i) What would you see in(a)(i) above?
(ii) Name the catalyst used in(a)(ii).
(iii) In the reaction referred to in (a)(ii) the catalyst glows red hot. Why?
(iv) What is the name of the industrial process which starts with the reaction referred to in (a)(ii)?

Q 3(c) (i) How soluble is ammonia in water?
(ii) Give two reasons to show that the solution of ammonia in water contains hydroxide ions.
(iii) Name a simple method you would employ to prepare ammonium salt in your laboratory.

Q 4(a)Calculate the empirical formula of the compound having 37.6 % sodium, 23.1% silicon and 39.3% oxygen. (work to two decimal places). [O=16;Na=23;Si=28]

Q 4(b)The empirical formula of a compound is C2H5. It has a vapour density of 29. Determine the relative molecular mass of the compound and hence its molecular formula.

Q 4(c) Solid ammonium dichromate (relative molecular mass = 252) decomposes according to the following equation:
(NH4)2Cr2O7® N2 + Cr2O3 + 4H2O
(i) What volume of nitrogen, at STP will be evolved when 63g of ammonium dichromate is decomposed?
(ii) If 63g of ammonium dichromate is heated above 1000c , what will be the loss of mass?
(H=1;N=14;O=16;Cr=52).

Q5(a) The following substances are put into the blast furnace when manufacturing iron :
        iron ore, coke, limestone and hot air.
(i) what is the name of the most common ore of iron and what is its chemical formula ?
(ii) what is the purpose of using (1) the coke (2) the limestone?
(iii) write the equation for the reduction reaction which produces iron.
(iv) Name the two substances which separate at the bottom of the blast furnace.

Q 5(b)(i) What is the main impurity present in the iron produced in the blast furnace?
(ii) By what chemical process is this impurity removed in steelmaking?
(iii) What is added to steel to make stainless steel?

Q6(a)(i) Write the equation for the laboratory preparation of the sulphur dioxide from sodium sulphite.
(ii) How is the sulphur dioxide collected?
(iii) What does the method of collection tell you about the density of sulphur dioxide?
(iv) What do you see when sulphur dioxide is bubbled through an acidified potassium dichromate solution?

Q 6(b)Write one equation in each case to show the action of sulphur dioxide?
(i) a reducing agent;
(ii) an oxidizing agent;
(iii) an acid anhydride.

Q 6(c)(i) what is the similarity in the use of sulphur dioxide and chlorine as bleaching agents?
(ii) When chlorine is involved in bleaching , what is the type of chemical reaction that changes the coloured compound to a colourless one?
(iii) What is the reason for not using chlorine to bleach wool?

Q7.(a)Outline the steps required to convert hydrogen chloride to anhydrous Iron (III) Chloride. Write the equations for the reactions which take place.

7(b)(i) What are the two steps necessary to change Lead Carbonate into Lead Chloride?
(ii) Give the name of soluble lead salt and write the equation for the action of heat on this salt.
(iii)Write the equation for the preparation of nitric acid from potassium nitrate.