

## ICSE Chemistry: Model Paper 4

*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.*

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*Section I is compulsory. Attempt any four questions from Section II.*

*The intended marks for questions or parts of questions are given in brackets [ ].*

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### SECTION I (40 Marks)

*Attempt all questions from this Section*

#### Question 1

- a) Mention the terms defined by the following sentences: [8]
1. The mass of a given volume of gas compared to the mass of an equal volume of hydrogen.
  2. A soluble base.
  3. The insoluble solid formed when two solutions are mixed together.
  4. Compounds containing carbon and hydrogen only.
  5. The property of spontaneous giving up water of crystallization to the atmosphere.
  6. A compound that is soluble in water and the only negative ions in solution are hydroxyl ions.
  7. An oxide, which reacts with both acids & alkalis.
  8. The number that tells us the mass of an atom in comparison to  $1/12$  of mass  $C^{12}$  atom
- b) Describe how the following properties of an element changes, along the group and across the period [4]
1. Non-metallic character
  2. Electron affinity
  3. Atomic size
  4. Reactivity of element
- c) Name the following [8]
1. A solid acid
  2. A complex salt
  3. A tri basic acid
  4. An element having highest electronegative
  5. A polar covalent neutral compound
  6. Element having lowest ionization energy.
  7. An acidic solution in which there is only partial ionization of the solute molecules.
  8. A solution containing molecules as well as ions.
- d) Write the balanced equation for following reactions [6]
1. Manganese (IV) oxide & conc. Hydrochloric acid.
  2. Sulphur & hot conc. Nitric acid
  3. Zinc & conc. Nitric acid
  4. Ammoniac gas with excess chlorine
  5. Ammonia with hot copper (II) oxide
  6. Hydrochloric Acid with Potassium permanganate

- e) Explain why the following happens: [5]
1. A black spongy mass is obtained, when conc. Sulphuric acid is added to sugar.
  2. A red rose petal loses its colour when placed in moist Sulphur dioxide.
  3. White fume are produced when excess ammonia and chlorine are mixed.
  4. Reddish brown fumes are seen when conc. Nitric acid is heated with copper.
  5. A yellow ppt. Is obtained when KI solution is added to lead nitrate solution
- f) What volume of hydrogen sulphide at S.T.P will burn in oxygen to yield 12.8g of Sulphur dioxide according to equation.  $[2\text{H}_2\text{S} + 3\text{O}_2 \longrightarrow 2\text{H}_2\text{O} + \text{SO}_2]$  [6]  
 [H = 1, O = 16, S = 32 ]
- g) Give a chemical test to distinguish between the following pair of substance. [3]
1. Ammonium sulphate & Ammonium Chloride
  2. Conc. Nitric acid & dil. Nitric acid
  3. Sodium carbonate & Sodium sulphate

### SECTION II (40 Marks)

Attempt **ANY FOUR** questions from this section

#### Question 2

- a) Which feature of the Ammonia molecule leads to the formation of the Ammonium ion when ammonia is dissolved in water? [1]
- b) Name the other ion formed when Ammonia is dissolved in water [1]
- c) Give one test that can be used to detect the presence of the ion produced in ques. 2b [1]
- d) Write the reaction for following reactions which result in the formation of Ammonia [2]
1. A mixture of Ammonium chloride and slaked lime is heated.
  2. Aluminum nitride & Water
- e) Answer following questions in reference to industrial preparation of Nitric Acid [5]
1. What are the different conditions required in the process.
  2. Why no heating of catalytic chamber is required when production starts?
  3. Write down equations of different reactions taking place in this production.

#### Question 3

The electronic configuration of atoms of three elements, E, F and G is as given below:

E (2, 8, 8, 1); F (2, 6); G (2, 8, 7).

- a) Represent the molecule of F by a dot diagram. [1]
- b) What type of bonding is in the molecule of F? [1]
- c) Write down the formula of the compound formed between E and G. [1]
- d) What type of bonding is between E and G? [1]
- e) Classify the elements E, F and G as metals and non-metals. [1]
- f) Which amongst E, F and G is likely to be a good conductor of electricity [1]
- g) Add word or words to each of the sentences given below to make a correct statement. [4]
1. Sulphur reacts with oxygen to form sulphur dioxide gas.
  2. Sodium sulphate reacts with calcium nitrate to form calcium sulphate.
  3. Electrolysis of lead bromide liberates lead and bromine.
  4. Sulphur dioxide turns potassium dichromate green.
  5. Sulphuric acid dehydrates crystals of copper sulphate.

6. Zinc reacts with sulphuric acid to give hydrogen gas.
7. Ionic compounds are good conductor of electricity.
8. Hydrochloric acid gas is acidic in nature.

#### Question 4

- a) You are given a mixture of precipitated copper hydroxide and zinc hydroxide. Name a solvent in each case which will dissolve [3]
  1. Copper hydroxide only
  2. Copper hydroxide and Zinc hydroxide both.
- b) Name the property of the sulphuric acid that is made use in each of the following reactions. Give an equation for the chemical reaction in each case. [4]
  1. In preparation of HCl gas when the acid reacts with a metal chloride.
  2. In preparation of carbon monoxide gas from formic acid.
  3. As a source of hydrogen from active metals.
  4. As a source of Sulphur dioxide gas, when boiled with copper dust.
- c) How will you bring about oxidation of Sulphur dioxide, using chlorine water? Write a chemical equation support of your answer. [2]
- d) "Carbon dioxide and Sulphur dioxide gases can not be identified with only help of Lime water." Justify. [1]

#### Question 5

- a) What is the special feature of structure or Ethene and Ethyne? What type of reaction is common to these compounds? [2]
- b) Give two tests by which you can distinguish Alkane; Alkene and Alkyne. [2]
- c) Name two raw materials from which ethyl alcohol is manufactured. [1]
- d) What is denatured spirit (alcohol)? Name two chemicals commonly used for denaturing alcohol. Write harms caused in drinking denatured alcohol. [3]
- e) Write balanced equations when ethyl alcohol is [2]
  1. Made to react with sodium.
  2. Made to react with acetic acid.

#### Question 6

- a) Why does not aluminium occur in free state? Name one ore of aluminium that is found in abundance in India. [2]
- b) The alumina is purified by Hall's process. Write three fully balanced equations, showing how the alumina is purified? [Description is not required] [3]
- c) It has been found the pure alumina cannot be reduced to aluminium metal easily by electric current. Give two reasons. [2]
- d) Name two substances that are added to alumina, so as to reduce it electrically. [3]
  1. How does these substances help in the extraction of aluminum?

**Question 7**

- a) An acid of phosphorus has the following percent composition H=2.47%, P=38.27%  
O=59.26% [4]
1. Find the empirical formula of acid and its molecular formula. Given that its relative molar mass is 162 (H = 1, P = 31, O = 16).
- b) What is electroplating. What is its purpose? During electroplating of a spoon by silver [4]
1. Name a electrolyte that can be used for this purpose
  2. Name which material is used as Anode
  3. Name which material is used as Cathode
  4. Write Cathode and anode reactions.
- c) Why A.C. current should not be used for electrolysis. [1]
- d) Normally small steady current is used in electrolysis. [1]