St. Xavier's School, Doranda

Self Assessment Test [202O-2021] - Class X

Sub: CHEMISTRY

Time:2hrs

F.M = 80

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## SECTION 1[40 Marks]

### Attempt all questions from this section:

Question 1

(a) Choose the correct answer from the options given in the bracket: [5]

i) salt solution which does not react with ammonium hydroxide is ------ (Calcium nitrate/Zinc nitrate).

ii) The electrolysis of acidified water is an example of ----- reaction (redox reaction/synthesis

iii) Electrolysis of aqueous sodium chloride solution will form ------ at cathode (Hydrogen gas/sodium metal).

iv) Dry hydrogen chloride gas can be collected by-------- displacement of air (Downward/Upward)

v) Process of formation of ions from the molecules which are not in ionic state ----(Ionisation /dissociation.)

(b) Name the following: [Do not give examples]. [5]

i) The compounds which are soluble in water and the only negative ion in the solution are hydroxide ions.

i) ii) A substance which undergoes complete dissociation in fused or aqueous state on the passage of electric current.

ii) The electrode at which reduction occurs.

iii) A salt formed by partial replacement of ionizable hydrogen atoms of a polybasic acid by a metal or ammonium ion.

iv) An oxide which reacts with acids as well as bases to form salt and water only.

(c) Give reasons for the following: [5]

i) On electrolysis of dilute copper [II] sulphate solution, copper is deposited at cathode but no hydrogen gas evolves.

ii) The blue colour of copper sulphate solution fades when it is electrolysed using platinum electrodes.

iii) Copper, though a good conductor of electricity is a non-electrolyte.

iv) The basicity of acetic acid is one.

v) Graphite anode is preferred to platinum in the electrolysis of molten lead bromide.

(d) 1. Give one word answers: [5]

i) The ions furnished when an acid is dissolved in water.

ii) Sodium bicarbonate is an example of ---------- (acid salt, basic salt, normal salt).

iii) Carbonic acid is a ---------- acid. (dibasic, monobasic)

iv) A base which does not contain a metal ion.

2. Define pH.

(e) Give balanced equations for the reaction of dilute HCl with the following: [5]

i) Iron metal

ii) Sodium sulphide

iii) Zinc Sulphite

iv) Iron (III)oxide

v) Calcium carbonate

(f) State the formulae of the precipitate formed and its solubility in excess, when aqueous ammonia is added to the following metal salt solutions: [5]

i) Zinc
ii) lead
iii)Fe(II)
iv) Fe(III)
v)Copper

g) 1. State the particles present in the following: [3]

i) Aqueous solution of sodium chloride.
ii) Aqueous acetic acid
iii) sugar solution.

2. Give an example of an [2]

i) Active electrode
ii) Inert electrode

(h) Classify the following as strong electrolyte/weak electrolyte/non-electrolyte. [5]

i) Dilute sulphuric acid
ii) Ammonium hydroxide
iii) Chloroform
iv) Lithium hydroxide
v) Aqueous copper chloride

SECTION II (40 Marks)

Attempt any four questions from this section:

Question 2 [3+3+4]

(a) Complete the following statements by selecting the correct option from the choices given in bracket:

i) pH of acetic acid is greater than dilute sulphuric acid. so acetic acid contains ---------- concentration of hydrogen ions. (greater, low)
ii) The indicator which does not change colour on passage of HCl gas is ----- (methyl orange, phenolphthalein, moist blue litmus)
iii) The base which is not an alkali ----------. ( NH4OH, Ca(OH)2, Cu(OH)2 )

( b)

i) If a solution changes the colour of litmus from red to blue, its pH is -------- ( greater than 7 / less than 7).
ii) solution Q and R have Ph 5.2 and 12.2 respectively. Which solution completely dissociates into ions?
iii) Name the Electrode connected to the positive terminal of the battery.

( c) Give ionic equations for the following conversions and state whether it is oxidation or reduction.

i) Chloride ion to chlorine molecule.
ii) Lead ion to lead.

Question 3 [ 4+ 3+3]

(a) For the preparation of hydrogen chloride gas in the laboratory:

i)Name the acid used for the preparation of hydrogen chloride gas in the laboratory. Why is this particular acid preferred to other acids?

ii) Write the balanced chemical equation for the laboratory preparation of hydrogen chloride gas.

iii) Name the drying agent used to dry hydrogen chloride gas.

(b) For the preparation of hydrochloric acid in the laboratory :

i) Why is direct absorption of hydrogen chloride gas in water not feasible?

ii) What arrangement is done to dissolve hydrogen chloride gas in water?

iii) State a safety precaution taken during the preparation of hydrochloric acid.

(c) i) What property of HCl gas is demonstrated by Fountain experiment?

ii) What is the colour of water that enters the flask?

iii How will the action of dilute hydrochloric acid enable you to distinguish between sodium sulphite and sodium carbonate.

Question 4 [3+3+4]

(a) On adding dilute ammonia solution to a colourless solution of a salt, a white precipitate appears. This precipitate dissolves on adding excess of ammonia solution.

i) Identify the metal salt solution used.

ii) What is the formula of the white precipitate obtained?

iii) What is the colour of the solution formed when the precipitate dissolves in excess of the reagent?

(b) Name the following :

i) A normal salt which does not contain metal ion.

ii) A trivalent metal which produces hydrogen on reacting with alkali as well as with acids.

iii) The substance responsible for the formation of white fumes when hydrogen chloride gas is exposed to air.

(c) Sodium hydroxide solution was added to the solution containing the ions mentioned in the list X. List Y gives the details of the precipitate. Match the ions with their coloured precipitates.

| List X | List Y |
|---|---|
| Ferrous ion | White sparingly soluble in excess |
| Zinc ion | Dirty green |
| Ferric ion | White soluble in excess |
| Calcium ion | Reddish brown |

Question 5 [3+2+5]

(a) Write the equations for the reactions which take place at cathode and anode during the electrolysis of the following

i) Acidified water.

ii) Copper sulphate solution using copper anode.

iii) Molten lead bromide

(b) Name the gas evolved when sodium hydroxide is heated with ammonium salts. Give one chemical test for the above gas.

(c) Explain the following:

i) carbonic acid gives an acid salt but hydrochloric acid does not.

ii) Dilute HCl is stronger than highly concentrated acetic acid.

iii) Lead Carbonate does not react with dilute hydrochloric acid.

iv}Phosphoric acid is not a tribasic acid.

v) Sodium hydrogen carbonate shows the properties of an acid.

Question6 [4+2+4]

(a) State any one observation when dilute hydrochloric acid is added to the following:

i) Zinc metal

ii) Marble chips

iii) Sodium sulphide

iv) Magnesium sulphite

(b)Differentiate between the following pairs:

i) Conductivity of copper metal and copper sulphate solution.

ii) NaOH solution and NH4OH solution using copper sulphate solution.

(c) i) Give balanced chemical equation to convert two soluble metallic nitrates to insoluble chlorides.

(ii) What do you observe when hot concentrated caustic soda solution is added to aluminium. Give a balanced equation.

Question7 [3+3+4]

a i) Explain why the electrolysis of acidified water is an example of catalysis.

ii) Compare the change in mass of the cathode with the mass of the anode during the electrolysis of copper sulphate solution using copper electrodes.

iii) State your observation when lead nitrate solution is mixed with dilute hydrochloric acid and heated.

(b) Name the product at anode during the electrolysis of

i) Molten lead bromide using graphite electrode.

ii) Copper sulphate solution using copper anode.

iii) Acidified water using inert electrodes.

(c) i) What do you mean by selective discharge of ions? An aqueous electrolyte consists of the ions mentioned in the list, select the ion which could be discharged most readily during electrolysis. [Fe2+, Cu2+, Pb2+, H+]

ii) Give reasons for the formation of thick white fumes when a glass rod dipped in ammonia solution is brought near the mouth of a bottle full of HCl gas.

iii) Name a black metallic oxide that dissolves in dilute hydrochloric acid to give a coloured solution.

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