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STANES SCHOOL
(Affiliated to the Council for the Indian School Certificate Examination)
SECOND PRE-BOARD EXAM – 2017-18

SUBJECT: CHEMISTRY GRADE: X

DATE OF EXAMINATION:

DURATION: 2 Hours TOTAL MARKS:80

Instruction

Attempt all questions from Section A. Answer any four questions from Section B.

Atomic mass : Ag = 108, N = 14, O = 16, K = 19, Cl = 35.5, H = 1, O = 16, Ca = 40, P = 31

Avagadro Number : 6.023×10^{23}

Section A

Question 1

a. Identify the following: [5]

1. A salt formed by incomplete neutralization of an acid by a base.

2. On heating, this salt changes from green to black.

3. A compound which is insoluble in cold water, but soluble in hot water.

4.An acidic hygroscopic substance.

5. A basic hygroscopic substance.

b. Name the following: [5]

1. A yellow monoxide that dissolves in hot and concentrated alkali.

2. A chloride which gives reddish brown precipitate with sodium hydroxide.

3. The gas produced when ammonium nitrate undergoes thermal decomposition.

4. A colourless, odourless gas which forms an explosive mixture with air.

5. A colourless gas which has a disagreeable smell. It turns lead acetate paper black.

c. Pick out the correct answer from the second column that would match column 1: [5]

1. Zinc	ethylene glycol 4
2. Copper	chlorine
3. Ferrous ion	Bayer's reagent 5
4. Bleaching powder	electropositive 2
5. Alkaline potassium permanganate	electometallurgy 1
	Dirty green 3

d. Give the IUPAC name of the following: [5]

1. CH_3CH_2CHO

2. $CH_3CH(CH_3)CHOH$

3. HCOOH

4. $CH_3CH_2CH(Cl)CH_2CHCH_3$

5. $CH_3C{\equiv}CCH_2CH_3$

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e. Correct the mistake, if any in the given statements: [5]

1. The fountain experiment is used to study the acidic nature of a gas.

2. Mixture of nitrogen oxides are called aqua fortis,

3. The insoluble component present in super phosphate of lime is calcium hydrogen sulphate.

4. Coal is formed when wood is dehydrated.

5. Halogenation is the process by which sulphur is boiled with rubber.

f. The equation for the action of heat on calcium nitrate os : [5]

$$2Ca(NO_3)_2 \rightarrow 2CaO + 4NO_2 + O_2$$

1. How many moles of NO_2 are produced when 1 mole of calcium nitrate decomposes?

2. What volume of oxygen at stp will be produced on heating 65.6 g of calcium nitrate?

3. Find out the mass of calcium oxide formed when 65.6 g of calcium nitrate is heated.

4. Find out the mass of calcium nitrate required to produce 5 moles of gaseous product.

5. Find out the mass of calcium nitrate required to produce 44.8 L of NO_2 at stp.

g. Fill in the blanks: [5]

1. Compounds which are feebly ionized in aqueous solution are called _____.

2. The vessel in which electrolysis is carried out is called a _____.

3.The graphite or metal plates through which current enters or leaves the electrolyte is _____.

4. Reduction takes place at the _____.

5. Metals like sodium, potassium, calcium, magnesium and aluminium are not extracted by _____ methods.

h. Write balanced chemical equations for: [5]

1. Burning of aluminium in air.

2. Action of heat on aluminium hydroxide.

3. Action of chlorine with excess ammonia.

4. Action of water on magnesium nitride.

5. Action of heat on silver nitrate.

Section B

Question 2

a. You are provided with the following chemicals:

Ammonium hydroxide, chlorine, copper oxide, iron, lead nitrate, dilute sulphuric acid, lead

Using only chemicals of this given list, write equations for the following salt preparations. [5]

i. A salt by direct combination

ii. A soluble salt by neutralization of an alkali

iii. A soluble salt from an insoluble base.

iv. A salt by double decomposition.

v. A soluble salt from a metal.

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b. Give reason for the following:

i. Magnesium atom is smaller than calcium. [2]

ii. Aluminium is a highly electropositive metal, but it is not oxidized rapidly in air. [1]

iii. Pure acetic acid is known an glacial acetic acid. [2]

Question 3

a. Caustic soda solution is added to the given salt solutions, first a little and then in excess. Give chemical equations: [3]

i. Aluminium sulphate ii. Zinc chloride iii. Lead nitrate

b. Why is liquid ammonia a good refrigerant? [2]

c. Blue colour of copper sulphate solution slowly disappears when an iron nail is dipped into it. Why? [2]

d. State your observation when the following salts are heated: [3]

i. Lead nitrate ii. Silver nitrate iii. Sodium nitrate

Queston 4

a. i. Name the ore of aluminium. [1]

ii. Why is cryolite and fluorspar added in the reduction of alumunium? [2]

iii. Give the chemical equations relating to the reduction of alumina to impure metal. [3]

iv. Name the element which which serves as the cathode in the Hall-Heroult's process. [1]

b. State the main components of the following alloys: [3]

i. Brass ii. Duralumin iii. Bronze

Question 5

a. A colourless gas G fumes strongly in air. The gas gives dense white fumes when a glass rod dipped in ammonia solution is held near the gas. [5]

Answer the following question:

i. Name the gas G.

ii. Name two chemicals used in the preparation of the gas G.

iii. Write the chemical equation for the reaction between the chemicals.

iv. Why does the gas fume strongly in air?

v. Give reason for the formation of the dense white fumes.

b. How will you bring about the following conversions? [4]

i. Ethanol to acetic acid ii. Ethene to ethane

c. _____ reactions are characteristic of saturated hydrocarbons. [1]

Question 6

a. Water can be split into hydrogen and oxygen under suitable conditions. The equation representing the change is:

$$2H_2O(g) \rightarrow 2H_2 + O_2$$

If the given experiment results in 2500 cc of hydrogen being produced, what volume of oxygen is liberated at the same time, under the same conditions of temperature and pressure. [2]

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b. Potassium chloride and silver nitrate solutions are mixed together. Calculate : [4]

i. the weight of potassium chloride and ii. The weight of silver nitrate solutions

which on mixing will produce 2.87 g of silver chloride.

c. A hydrocarbon decolourises $KMnO_4$ solution but does not form any precipitate with ammonical silver nitrate. [4]

i. Is the hydrocarbon saturated or unsaturated?

ii. What is the type of bond between the carbon atoms?

iii. State your observation and give the reaction for its reaction with bromine solution.

Question 7

a. Find the chemical formula of an acid of phosphorus which has the following composition. [4]

2.47% of hydrogen, 38.2% of phosphorus and 59.26% of oxygen. The relative molecular mass is 162.

b. Identify the anion present in the following compounds. [3]

i. Compound X on heating with with copper turnings and concentrated sulphuric acid liberates a reddish brown gas.

ii. Compound Y on reacting with dilute sulphuric acid liberates a gas which turns lime water milky, but has no effect on acidified potassium permanganate.

iii. Compound Z on reaction with barium chloride solution gives a white precipitate insoluble in dilute hydrochloric acid.

c. Substance P reacts with in presence of lime to form R. R is a hydrocarbon which contains one carbon atom.

i. Name the compounds P and Q [2]

ii. Write the balanced chemical equation for the reaction. [1]

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