CAREERS360

CBSE Class 12 Chemistry

Question Bank

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Chemistry **Chapter 5**

Acids, Bases and Salts

Long Answer Type Questions

Q1. Write chemical equation when zinc granules react with

a) Sulphuric acid
b) Hydrochloric acid
c) Aluminium chloride
d) Sodium hydroxide
e) Nitric acid

Q2. How sodium hydroxide is obtained from common salt? Name the other by products obtained during the process.

Q3. How can pH change cause tooth decay, and how is it prevented ?

Q4. How washing soda is obtained? Write the uses of washing soda.

Q5. The metal salt 'A' is blue in colour. When salt 'A' is heated strongly over a burner, then a substance 'B' present in it is eliminated and a white powder 'C' is left behind. When a few drops of a liquid 'D' are added to powder 'C', it becomes blue again.

a) Identify A, B ,C, D
b) Write the chemical equations involved.
c) Give an example of the salt which also shows above property.

Q6. Equal lengths of magnesium ribbon are taken in two test tubes A & B. H_2SO_4 is added to a test tube A and H_2CO_3 in test tube B in equal amounts.

a) Identify the test tube showing vigorous reaction.
b) Give reason to support your answer.
c) Name the gas liberated in both the test tubes. How will you prove its liberation?
d) Write chemical equations for both the reactions.
e) Out of the two acids taken above, which one will have lower pH value and lower H^+ concentration respectively?

Q7. What is baking soda? How is it prepared? Give its important properties and uses.

Q8. Define pH. What is the importance of pH in everyday life?

Q9. How is Plaster of Paris prepared? Give important uses of Plaster of Paris.

Q10. How pH scale determines the strength of acids and bases?

Q11. How is Bleaching powder prepared? Give its important uses?

Q12. What are the three steps involved in the manufacture of washing soda?

Q13. What is meant by water of crystallisation? Explain with example?

Very Short Answer Type Questions

Q1. What is the difference between mineral acids and organic acids?

Q2. How is the concentration of hydronium ions (H_3O^+) affected when a solution of an acid is diluted.

Q3. What is the cause of tooth decay? What is the pH of mouth required?

Q4. What happens when metal reacts with dil. HCl or dil. H_2SO_4?

Q5. Explain why aqueous solution of an acid conducts electricity.

Q6. Three acidic solutions A, B and C have pH= 0,3 and 5 respectively.

a) Which solution has the highest concentration of H^+ ions?
b) Which solution has the lowest concentration of H^+ ions?

Q7. Why does 1M HCl solution have a high concentration of H^+ ions than 1M CH_3COOH solution?

Q8. What is the biological importance of pH?

Q9. What is the chemical formula of washing soda? What is the chemical name and chemical formula of washing soda?

Q10. Why is sodium hydrogen carbonate an essential ingredient in ant acids?

Q11. Why should curd and sour substances not be kept in brass and copper vessels?

Multiple Choice Questions

1. Tomato is a natural source of which acid?
   a) Acetic acid
   b) Citric acid
   c) Tartaric acid
   d) Oxalic acid

2. What is the pH of Blood?
   a) 7
   b) 8
   c) 73
   d) 83

3. $Na_2Co_3.10H_2O$ is
   a) Washing soda
   b) Baking soda
   c) Bleaching powder
   d) Tartaric acid

4. The acid present in stomach is
   a) HCl
   b) HNo_3
   c) H_2So_4
   d) None of these

5. At what temperature is gypsum heated to form Plaster of Paris?
   a) 90^0 C
   b) 100^0 C
   c) 110^0 C
   d) 120^0 C

6. How many water molecules does hydrated calcium sulphate contain?
   a) 5
   b) 10
   c) 15
   d) 20

7. Tooth enamel is made up of
   a) Calcium phosphate
   b) Calcium carbonate
   c) Calcium oxide
   d) Potassium

8. What is the pH of acid rain.
   a) Below 7
   b) Below 6
   c) Below 5.6
   d) Above 7

9. What is the chemical formula of Plaster of Paris
   a) $CaSO_4.2H_2O$
   b) $CaSO_4.1/2H_2O$
   c) $CaSO_4.H_2O$
   d) $CaSO_4.10H_2O$

10. Lime water is
    a) CaO
    b) $Ca(OH)_2$
    c) $CaCO_3$
    d) $CaSO_4$

11. pH of base solution is
    a) 7
    b) <7
    c) 77
    d) None of these.

12. Which of the following acids is a strong acid?
    a) HCl
    b) CH_3COOH
    c) H_3PO_4
    d) H_2CO_3

13. Acid present in apple is
    a) Oxalic acid
    b) Acetic acid
    c) Formic acid
    d) Tartaric acid

14. Range of pH scale is
    a) 7 to 10
    b) 0 to 10
    c) 0 to 14
    d) 7 to 14

Assertion and Reasoning Type Questions

Two statements (Assertion-A and Reason-R) are given. Select the correct answer to these questions from codes a, b, c and d as given below

a) Both A and R are true, and R is the correct explanation of the assertion.
b) Both A and R are true, but R is not the correct explanation of the assertion.
c) A is true but R is false.
d) A is false but R is true.

1. Assertion : When an acid reacts with a metal, hydrogen gas is evolved and a corresponding salt is formed.
   Reason: When a base reacts with a metal along with the evolution of hydrogen gas a salt is formed which has a negative ion composed of the metal and oxygen.
2. Assertion: When an acid reacts with a metal carbonate or metal hydrogen carbonate, it gives the corresponding salt, carbon dioxide gas and water.
   Reason: Acidic and basic solutions in water conduct electricity because they produce hydrogen and hydroxide ions respectively.
3. Assertion: Mixing concentrated acids or bases with water is a highly exothermic process.
   Reason: Acid and Bases neutralise each other to form corresponding salts and water.

Q:- Read the following and answer any four questions:-

Sorensen in 1909 suggested a convenient method of expressing the H_3O^+ ion concentration in terms of pH. Thus, to express the acidity or alkalinity of a solution, it is sufficient to express only the H_3O^+ ion concentration.

a) What is the meaning of the symbol pH?
b) How is the pH of a solution of an acid influenced when it is diluted.
c) What is the nature of the salt if pH of its solution is greater than 7.
d) What is the nature of the solution if its pH is below 7.
e) What is the pH of water?

Q. Read the following and answer any four questions.

Electrolysis of aqueous solution of sodium chloride is a method used for the manufacture of sodium hydroxide.

a) Name the process used.
b) Write the chemical reaction involved in the above method.
c) Name the gas liberated at anode.
d) Name the gas liberated at cathode.
e) What is brine?

Carbon and Compounds

Long Answer Type Questions

Q1. An organic compound A on heating with concentrated H_2SO_4 forms a compound B which on addition of one mole of hydrogen in presence of Ni forms a compound C. One mole of compound 'C' on combustion forms two moles of CO_2 and 3 mole of H_2O. Identify the compounds A, B and C. Write the chemical equations of the reactions involved.

Q2. Write the equations for each reaction. Identify the compounds A to F in the following reaction sequence

(i) $CH_3CH_2OH \xrightarrow[\text{dil.HCl}]{KMnO4/KOH} A + H_2O$

(ii) $CH_3CH_2OH + A \xrightarrow[\Delta]{\text{Conc. } H_2SO_4} B + H_2O$

(iii) $B + NaOH \longrightarrow C + CH_3CH_2OH$

(iv) $A + NaHCO_3 \longrightarrow C + D + H_2O$

(v) $CH_3CH_2OH + E \longrightarrow CH_3CH_2ONa + H_2$

Q3. What are soaps and detergents? Explain the mechanism of cleansing action of soaps and detergents.

Q4. Explain the given reactions with examples

(a) Hydrogenation reaction

(b) Oxidation reaction

(c) Substitution reaction

(d) Saponification reaction

(e) Combustion reaction

Q5. Draw the structures for the following compounds

(i) Ethanoic acid

(ii) Brompentane

(iii)Butanone

(iv)Hexanal

Are structural isomers possible for bromopentane?

Q6. What is a Homologous series? Describe briefly the various homologous groups of Organic compounds.

Q7. How can Ethanol and Ethanoic acid be differentiated on the basis of their physical and chemical properties?

Q8. What is isomerism? Give the structural isomers of Pentane.

Q9. Give the structure of Diamond and explain its one property based upon structure.

Q10. Give the structure of Graphite and explain its one property based upon structure.

Q11. Complete the following chemical reactions and write the chemical name of the products obtained

(i) $CH_2=CH_2+H_2O \longrightarrow$

(ii) $CH_3COOH + NaOH \longrightarrow$

(iii) $CH_3CH_2OH \xrightarrow{H_2SO_4}$

(iv) $HCOOH+Na \longrightarrow$

(v) $CH_3COOH+CH_3OH \xrightarrow{\text{Conc. } H_2SO_4}$

Q12. Give IUPAC names of the following:-

i. $CH_3-\overset{\overset{O}{\|}}{C}-CH_2-CH_3$

ii. $CH_3-\underset{\underset{Cl}{|}}{CH}-CH_2-COOH$

iii. CH_3CH_2CHO

iv. $CH_3CH_2CH_2OH$

v. C_3H_7Cl

Very Short Answer Type Questions

Q1. What happens when a small piece of sodium is dropped into ethanol ?

Q2. Draw the structure of Benzene and cyclohexane.

Q3. Draw the electron dot structure of Ethane.

Q4. Give two points of difference between soap and detergent. Would you be able to check if water is hard by using a detergent.

Q5. Where do compounds of Carbon, find its applications?

Q6. Micelle formation will take place when soap is dissolved in Organic solvent?

Q7. What is hydrogenation? What is its industrial application?

Q8. Explain why washing clothes with hard water is not effective.

Q9. Define allotropy. Name three allotropic forms of carbon.

Q10. Give the structure of Fullerenes.

Q11. What is saponification? Give an example.

Q12. Why detergents are preferred over soap?

Q13. What is meant by hydrolysis of an ester? Explain.

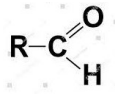
Q14. What is meant by denatured alcohol? What is the need to denature alcohol ?

Q15. Explain soaps are not effective cleansing agents in hard water?

Multiple Choice Questions

1. The following saturated hydrocarbon cannot show isomerism.

   a) Methane b) Butane c) Pentane d) Hexane

2.  is the functional group of

   a. Ketones b. Alcohols c. Aldehydes d. Carboxylic Acid

3. Maximum covalency of Carbon is

   a. 2 b. 4 c. 6 d. 1

4. n-Pentane and isopentane represent

   a. Structural isomers b. Homologous c. Same compound d. None of the above

5. C_3H_8 belongs to the homologous series of

   a. Alkynes b. Alkenes c. Alkanes d. Cyclo alkanes

6. The number of isomers of Pentane is

   a. 2 b. 3 c. 4 d. 5

7. Name the functional group present in CH_3COCH_3

   a. Alcohol b. Carboxylic acid c. Ketone d. Aldehyde

8. Addition reactions are undergone by

   a. alkanes b. alkenes c. alkynes d. both alkenes and alkynes.

9. Vinegar is :-

   a. 25% acetic acid b. 6-8% acetic acid c. Pure acetic acid d. 50% acetic acid

10. Soaps are formed by saponification of

    a. alcohols b. glycosides c. esters d. carboxylic acids

11. Buckminsterfullerene is an allotropic form of

    a. Phosphorous b. Sulphur c. Carbon d. Tin

12. How many electrons are there in the outermost shell of carbon

    a. 1 b. 2 c. 3 d. 4

13. The functional group present in Ethanol is

    a. –OH b. –CHO c. –COOH d. None of these

14. Any two adjacent members of a homologous series differ by

    a. CH_3 unit b. CH_2 unit c. CH unit d. C_2H_4 unit

15. The property of self-linkage among identical atoms to form long chain compounds is known as:-

    a. Catenation b. Isomerism c. Halogenation d. All of the above

Assertion-A and Reasoning-B Type Questions

Two statements (Assertion-A and Reason-R) are given Select the correct answer to these questions from codes a,b,c and d as given below

(a) Both A and R are true, and R is the correct explanation of the assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.

(c) A is true but R is false.

(d) A is false but R is true.

1. Assertion:- Carbon is a versatile element that forms the basis for all living organisms and many of the things we use.

   Reason: The large variety of compounds are formed by carbon because of its tetravalency and the property of the catenation that it exhibits.

2. Assertion: Covalent bonds are formed by the sharing of electrons between two atoms so that both can achieve a completely filled outermost shell.

   Reason: Carbon forms covalent bonds with itself and other elements such as hydrogen, oxygen, sulphur, nitrogen and chlorine.

3. Assertion: The heteroatoms which confer specific properties to the organic compounds, regardless of the length and nature of the carbon chain are called functional groups.

   Reason: The functional groups such as alcohols, aldehydes, ketones and carboxylic acids bestow characteristic properties to the carbon compounds that contain them.

Q. Read the following and answer any four questions.

Ethanoic acid reacts with ethanol in presence of an acid catalyst to form ester

(a) Write the chemical reaction.

(b) What this reaction is called?

(c) How this reaction can be used as a test for alcohols?

(d) During the reaction H^+ is released by acid or alcohol.

(e) What is the role of acid catalyst in the reaction.

Q. The series of organic compounds in which same group substitutes for hydrogen in a carbon chain is called a homologous series. e.g alkanes, alkenes, alcohols, carboxylic acids

(a) Write the general formula for homologous series of alkanes, alkenes, alkynes.

(b) Write the functional group of alcohols, aldehydes, ketones.

(c) Draw the structure of functional group of carboxylic acid.

(d) What happens to the physical properties in a homologous series.

(e) Organic compounds in a homologous series show similar chemical properties. Comment.

Chemistry **Chapter 1**

Chemical Reaction and Equations

Long Answer Type Questions

Q1. Explain the type of reactions represented by the following equations

(i) $CaO + CO_2 \rightarrow CaCO_3$
(ii) $Mg + CuSO_4 \rightarrow MgSO_4 + Cu$
(iii) $CuSO_4 + 2NaOH \rightarrow Cu(OH)2 + Na_2SO_4$
(iv) $2\ Na + H_2O \rightarrow 2NaOH + H_2$
(v) $NH_4NO_2 \rightarrow N_2 + 2H_2O$

Q2. What is the difference between displacement and double displacement reactions? Write equations for their reactions.

Q3. (a) Write a balanced chemical equation for the process of photosynthesis and the conditions of the reaction giving physical state of all he substances.

(b) Classify the following reactions as exothermic or endothermic.

(i) Electrolysis of water.

(ii) Burning of natural gas.

(iii) Decomposition of Calcium Carbonate

(iv) Burning of magnesium ribbon in air.

Q4. Write the balanced chemical equations for the following reactions.

a. Calcium Hydroxide + Carbon Dioxide ---> Calcium Carbonate + Water
b. Barium Chloride + Aluminium Sulphate ---> Barium Sulphate + Aluminium Chloride

Q5. Explain oxidation and reduction with two examples in each case.

Q6. a) Define corrosion.

b) What is corrosion of iron called?

c) How will you recognise the corrosion of iron.

d) Why corrosion of iron is a serious problem ?

e) How can we prevent corrosion?

Q7. What is Balanced Chemical Equation? Why should the chemical equation be balanced?

Q8. What is Rancidity? How can it be prevented?

Q9. Explain Redox reaction with suitable examples.

Q10. Balance the following chemical equations.

a) $Al_2(SO_4)_3 + NaOH \text{ ---> } Al(OH)_3 + Na_2SO_4$
b) $Mg(OH)_2 + HCl \text{ --> } MgCl_2 + H_2O$
c) $Al(OH)_3 \text{ --> } Al_2O_3 + H_2O$

d) $CaCO_3 + HCl \rightarrow CaCl_2 + H_2O + CO_2$
e) $BaCl_2 + H_2SO_4 \rightarrow BaSO_4 + HCl$

Very Short Answer Type Question

Q1. What can be seen when a strip of copper metal is placed in a solution of silver nitrate?

Q2. State one industrial application of reduction process.

Q3. Why does the colour of Copper Sulphate solution change, when an iron nail is dipped in it?

Q4. What happens when water is added to quick lime? Is the reaction endothermic or exothermic?

Q5. On what basis is a chemical equation balanced? Name the oxidising and reducing agent in the following equation

$$CuO + H_2 \longrightarrow Cu + H_2O$$

Q6. Why should a magnesium ribbon be cleaned before burning in air?

Q7. Which type of reaction produce insoluble salts?

Q8. How does food become rancid?

Q9. Which gas sis filled in the chips packets to prevent rancidity? And Why?

Q10. Which one is a chemical change- Rusting of iron or melting of iron?

Multiple Choice Questions

1. Oxidation is a process which involves
   a) Addition of Oxygen
   b) Addition of Hydrogen
   c) Addition of Nitrogen
   d) None of the above

2. A substance added to food containing fats and oils is called
   a) Oxidant
   b) Rancid
   c) Coolant
   d) Antioxidant

3. The correct formula of rust is
   a) Fe_2O_3
   b) Fe_3O_4
   c) $Fe_2O_3.xH_2O$
   d) $Fe_2O_4.xH_2O$

4. $Pb + CuCl_2 \rightarrow PbCl_2 + Cu$
   The above reaction is an example of
   a) Combination

b) Decomposition
c) Displacement
d) Double Displacement

5. The reaction of H_2 gas with oxygen gas to form water is an example of
   a) Combination reaction
   b) Redox reaction
   c) Endothermic reaction
   d) All of these

6. $MnO_2 + 4HCl \rightarrow MnCl_2 + H_2O + Cl_2$
   The above reaction is an example of
   a) Oxidation
   b) Reduction
   c) Combination
   d) Displacement

7. Burning of Coal is
   a) Exothermic Reaction
   b) Endothermic Reaction
   c) Oxidation Reaction
   d) None of these

8. Randicity occurs when oily foods are
   a) Oxidised
   b) Reduction
   c) Decomposed
   d) All of these

9. It is necessary to balance a chemical equation in order to satisfy the law of
   a) Conservation of motion
   b) Conservation of mass
   c) Conservation of momentum
   d) Conservation of energy

10. When a gas is passed through lime water it becomes milky, the gas may be:-
    a) NO_2
    b) NH_3
    c) CO_2
    d) None of these

Q. Read the following and answer any four questions:

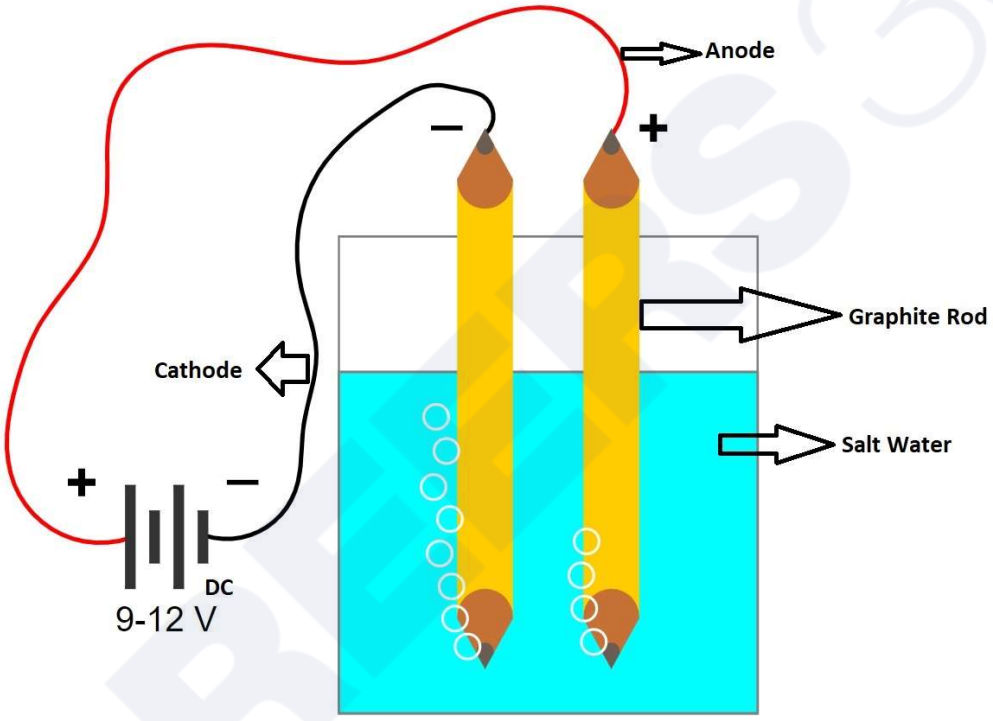
Oxidation is the gain of oxygen or loss of hydrogen. Reduction is the loss of oxygen or gain of hydrogen in the reaction.

$MnO_2 + 4HCl \longrightarrow MnCl_2 + 2H_2O + Cl_2$

(a) Name the compound oxidised.
(b) Name the compound reduced.
(c) Name the oxidising agent.
(d) Name the reducing agent.
(e) Define oxidation and reduction on its basis.

Q. Read the following and answer any four questions:

Electrolysis is a process of decomposition of an electrolyte by the passage of electricity through the aqueous solution or molten (fused) state. During the electrolysis of water as shown in the diagram given below:-



(a) Identify the gases evolved at anode and cathode.
(b) Why are the amounts of gases collected in the two test tubes are of not the same volume?
(c) What type of reaction is this?
(d) Why should we use salt water?
(e) Write the reaction involved.

Assertions and Reasoning Type Questions

Directions :- Two statements (Assertion-A and Reason- R) are given. Select the correct answer to these questions from codes a,b,c and d as given below.

(a) Both A and R are true, and R is the correct explanation of assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.
(c) A is true but R is false.
(d) A is false but R is true.

Q1. Assertion: Stoichiometric co-efficients are the numbers which are put before compounds or elements to balance the chemical equation.

Reason:- Chemical Equation is balanced to justify the law of conservation of mass.

Q2. Assertion: When Zinc rod is dipped into aqueous solution of copper sulphate, the colour of the solution changes.

Reason: Zinc being more reactive displaces less reactive copper from its aqueous solution resulting in the formation of Zinc sulphate which is colourless.

Q3. Assertion: Heat is required for the decomposition of lead nitrate.

Reason: Decomposition reactions are endothermic.

Q4. Assertion: During displacement reactions precipitates are usually formed.

Reason: Precipitation reaction produce insoluable salt.