INDIAN SCHOOL AL WADI AL KABIR

Class: X	**Department: SCIENCE 2020 – 21** **SUBJECT : CHEMISTRY**	**Date of completion:** **25-10-2020**
Worksheet No: 04 **WITH ANSWERS**	**CHAPTER: ACIDS, BASES AND SALTS**	**Note:** **A4 FILE FORMAT**
Name of the student:	**Class & Sec:**	**Roll No:**

OBJECTIVE TYPE QUESTIONS

MULTIPLE CHOICE QUESTIONS

1. A solution reacts with zinc granules to give a gas which burns with a pop sound. The solution contains:-
   (a) $Mg(OH)_2$ (b) Na_2CO_3 (c) NaCl (d) HCl
2. The indicator which produces a pink colour in an alkaline solution is:-
   (a) Methyl orange (b) turmeric powder (c) phenolphthalein (d) litmus paper
3. A solution turns blue litmus red. Its pH is likely to be :-
   (a) 7 (b) 5 (c) 8 (d) 14
4. The salt which will give an acidic solution on dissolving in water is:-
   (a)KCl (b) NH_4Cl (c) Na_2CO_3 (d) CH_3COONa
5. The pH values of four solutions A, B, C and D are 6, 8, 10, 5 respectively. Arrange the solution in the increasing order of hydrogen ion concentration.
   (a) A, B, C, D (b) D, C, B, A (c) C, A, D, B (d) C, B, A, D

ASSERTION-REASONING QUESTIONS

For the following questions, two statements are given-one labelled Assertion (A) and the other labelled Reason(R). Select the correct answer to these questions from the options (i) , (ii), (iii) and (iv)as given below:

(i)Both A and R are true and R is the correct explanation of the Assertion.
(ii)Both A and R are true but R is not the correct explanation of the Assertion.
(iii)A is true but R is false.
(iv)A is false but R is true.

6. Assertion:-While dissolving an acid or base in water, the acids must always be added slowly to water with constant stirring.
   Reason:-Dissolving an acid or base in water is highly exothermic reaction.
7. Assertion:- HCl gas does not change the colour of dry blue litmus paper.
   Reason:- HCl gas dissolves in water present in wet litmus paper to form H+ ions.
8. Assertion:-H_2CO_3 is a strong acid.
   Reason:- A strong acid dissociates completely or almost completely in water.

9. Assertion:-Sodium hydroxide reacts with Zinc to produce hydrogen gas.
   Reason:-Acids reacts with active metals to produce hydrogen gas.

ONE MARK QUESTIONS

10. Name the gas evolved when dilute HCl reacts with sodium hydrogencarbonate.
11. What is the name of the indicator which can be used for testing the pH of a solution?
12. Two solutions X and Y have pH=4 and pH=8 respectively. Which solution will give alkaline reaction and which one acidic?
13. What would be the colour of litmus in a solution of sodium carbonate?
14. With which substance should chlorine be treated to get bleaching powder?

THREE MARK QUESTIONS

15. (a) Define olfactory indicators. Name two substances which can be used as olfactory indicators.
    (b) Choose strong acids from the following:-
    CH_3COOH, H_2SO_4, H_2CO_3, HNO_3
16. (a) Name the compound which is obtained from baking soda and is used to remove permanent hardness of water.
    (b)Write its chemical formula.
    (c)What happens when it is recrystallized from its aqueous solution?
17. You have four solutions A, B, C and D. The pH of solution A is 6, B is 9, C is 12 and D is 7.
    (i) Identify the most acidic and most basic solutions.
    (ii) Arrange the above four solutions in the increasing order of H+ ion concentration.
    (iii) State the change in colour of pH paper on dipping in solution C and D.
18. Answer the following questions:-
    (i) State the colour of phenolphthalein in soap solution.
    (ii) Name the by-product of chlor-alkali process which is used for the manufacture of bleaching powder.
    (iii) Name one indicator which specifies the various levels of H+ ion concentration.

FIVE MARK QUESTIONS

19. (a) State the chemical properties on which the following uses of baking soda are based:-
    (i) As an antacid
    (ii) As soda-acid fire extinguisher
    (iii) To make bread and cake soft and spongy.
    (b)How washing soda is obtained from baking soda? Write balanced chemical equation.

20. On passing excess CO_2 gas through lime water, it first turns milky and then becomes colourless. Explain why? Write all the chemical equations of the reactions involved.

21. Five solutions A, B, C, D and E when tested with universal indicator showed pH as 4, 1, 11, 7 and 9 respectively. Which solution is (a) neutral (b) strongly alkaline(c) strongly acidic (d) weakly acidic (e) weakly alkaline?
Arrange the pH in increasing order of hydrogen ion concentration.

22. Equal length of magnesium ribbon are taken in two test tubes A and B .H_2SO_4 is added to test tube A and H_2CO_3 in the test tube B in equal amounts.
(a) Identify the test tube having 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.

PREVIUOS YEAR BOARD QUESTIONS

23. A chemical compound X is used in the soap and glass industry. It is prepared from brine.
(a) Write the chemical name, common name and chemical formula of X.
(b) Write the equation involved in its preparation.
(c) What happens when it is treated with water containing Ca or Mg salts?

24. Why do acids not show acidic behaviour in the absence of water?

25. Give two important uses of washing soda and baking soda.

26. What happens when chlorine is passed over slaked lime at 313K? Write chemical equation of the reaction involved and state two uses of the product obtained.

27. Classify the following salts in to acidic, basic and neutral.
Potassium sulphate, ammonium chloride, sodium carbonate, sodium chloride.

EXEMPLAR QUESTIONS

28. What will be the action of the following substances on litmus paper?
Dry HCl gas, Moistened NH_3 gas Lemon juice, carbonated soft drink, curd, soap solution.

29. What happens when nitric acid is added to egg shell?

30. A metal carbonate X on reacting with an acid gives a gas which when passed through a solution Y gives the carbonate back. On the other hand, a gas G that is obtained at anode during electrolysis of brine is passed on dry Y, it gives a compound Z, used for disinfecting drinking water. Identify X, Y, G and Z.

ANSWERS

OBJECTIVE TYPE QUESTIONS

MULTIPLE CHOICE QUESTIONS

1. (d) HCl
2. (c) phenolphthalein
3. (b) 5
4. (b) NH_4Cl
5. (d) C, B, A, D

ASSERTION-REASONING QUESTIONS

6. (i)Both A and R are true and R is the correct explanation of the Assertion.
7. (ii)Both A and R are true but R is not the correct explanation of the Assertion
8. (iv)A is false but R is true.
9. (ii)Both A and R are true but R is not the correct explanation of the Assertion.

ONE MARK QUESTIONS

10. Carbon dioxide gas
11. Universal indicator.
12. Y will give alkaline and X will give acidic.
13. Blue.
14. $Ca(OH)_2$

THREE MARK QUESTIONS

15. (a) Those substances whose smell changes in acidic or basic solution.
    Eg:- Onion and vanilla
    (b) H_2SO_4, HNO_3

16.(a) Sodium carbonate
(b)Na_2CO_3
(c)It changes to washing soda, $Na_2CO_3.10H_2O$

17. (i) A is most acidic and C is most basic.
(ii) C< B< D< A
(iii) pH paper will become blue in C and green in D.

18.(i) Pink
(ii) Chlorine.
(iii)Universal indicator.

FIVE MARK QUESTIONS

19.(a) (i) It is weakly basic in nature and neutralises hyperacidity.
(ii)It liberates CO_2 with H_2SO_4 which extinguishes fire.
(iii)It liberates CO_2 on heating which makes bread and cake soft and spongy.

(b) $2NaHCO_3 \xrightarrow{Heat} Na_2CO_3 + H_2O + CO_2$

Baking soda on heating gives sodium carbonate which on crystallisation from aqueous solution gives washing soda.

$$Na_2CO_3 + 10H_2O \rightarrow Na_2CO_3.10H_2O$$

20. Lime water turns milky due to the formation of white insoluble calcium carbonate. It becomes colourless when excess of CO_2 is passed due to the formation of $Ca(HCO_3)_2$ which is soluble in water.

$Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$

$CaCO_3 + CO_2 + H_2O \rightarrow Ca(HCO_3)_{2(aq)}$

21. (a) D with pH=7
(b)C with pH=11
(c)B with pH=1
(d)A with pH=4
(e)E with pH=9
Increasing order of H+ ion concentration.- C, E, D, A,B

22. (a) A will show vigorous reaction.
(b)It is because H_2SO_4 is a strong acid.
(c) Hydrogen gas will be formed. Bring a burning splinter near the gas. It will burn with pop sound. It shows gas liberated is hydrogen.
(d) $Mg + H_2SO_4 \rightarrow MgSO_4 + H_2$
$Mg + H_2CO_3 \rightarrow MgCO_3 + H_2$
(e) A(H_2SO_4) will have lower pH
B (H2CO3)will have lower concentration of H+

PREVIUOS YEAR BOARD QUESTIONS

23. (a) Sodium carbonate, washing soda, $Na_2CO_3.10H_2O$
(b)

$$NaCl + H_2O + CO_2 + NH_3 \rightarrow NH_4Cl + NaHCO_3$$

$$2NaHCO_3 \xrightarrow{\text{Heat}} Na_2CO_3 + H_2O + CO_2$$

$$Na_2CO_3 + 10\,H_2O \rightarrow Na_2CO_3.10\,H_2O$$

(c) It removes permanent hardness of water (due to the presence of Ca and Mg salts)

24. It is because acids do not dissociate in to ions in absence of water. But when an acid is dissolved in water, it forms hydrogen ions and hence shows acidic behaviour.

25. Uses of washing soda:-
(i) Used in the manufacture of glass, soap, paper and other compounds like borax etc.
(ii) Used in softening of hard water.
Uses of baking soda:-
(i) Used as an antacid.
(ii) It is an ingredient of baking powder.

26. Bleaching powder is formed.
$Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$
Uses:-
(i) Used as a bleaching agent in paper and textile industries.
(ii) Used as disinfectant in purification of drinking water.

27. Neutral:- Potassium sulphate, sodium chloride.
Acidic:-Ammonium chloride.
Basic:- Sodium carbonate.

EXEMPLAR QUESTIONS

28. Dry HCl gas will not have any effect on litmus paper. Moistened NH_3 gas will turn red litmus blue. Lemon juice, carbonated soft drink and curd will turn blue litmus red. Soap solution will turn red litmus blue.

29. Egg shell is made up of calcium carbonate which will react with HNO_3 to form CO_2 gas and H_2O along with calcium nitrate.

30. X is calcium carbonate.

$$\underset{\text{X}}{CaCO_3} + 2HCl \rightarrow CaCl_2 + CO_2 + H_2O$$

$$\underset{\text{Y}}{Ca(OH)_2} + CO_2 \rightarrow \underset{\text{X}}{CaCO_3} + H_2O$$

Y is calcium hydroxide.

$$2NaCl + 2H_2O \rightarrow 2NaOH + \underset{\text{At anode}}{\underset{\text{G}}{Cl_2}} + \underset{\text{at cathode}}{H_2}$$

The gas G is chlorine gas which is obtained at anode.

$$\underset{\text{Y}}{Ca(OH)_2} + Cl_2 \rightarrow CaOCl_2 + H_2O$$

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