

GRADE 10TH SCIENCE
CHAPTER 2

ACIDS BASES AND SALTS

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2. ACIDS, BASES AND SALTS

- The colour of neutral litmus solution is
 - Red
 - Blue
 - Purple
 - Yellow
- Which of the following indicators is an olfactory indicator?
 - Litmus
 - Vanilla
 - Turmeric
 - Phenolphthalein
- Which one is suitable method to find the accurate pH value?
 - pH meter
 - pH paper
 - Universal indicator
 - Litmus solution
- Which one of the following statements is correct about universal indicator?
 - It is a mixture of HCl and NaOH
 - It is a mixture of many indicators
 - It is a solution of phenolphthalein in alcohol
 - It is a solution of phenolphthalein in water.
- Which of the following properties are shown by dilute HCl?
 - It turns blue litmus red
 - It turns red litmus blue
 - It reacts with zinc and a gas is evolved
 - It reacts with solid sodium carbonate to give brisk effervescence
 - 1 and 2
 - 1 and 3
 - 1, 3 and 4
 - 2, 3 and 4

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6. A teacher gave two test tubes – one containing water and the other containing sodium hydroxide solution to two students. Then he asked them to identify the test tube containing sodium hydroxide solution. Which one of the following can be used for correctly identifying the test tube containing the solution of sodium hydroxide?
- Blue litmus
 - Red litmus
 - Sodium carbonate solution
 - Dilute HCl
7. Metallic oxides are _____ in nature, but non-metallic oxides are _____ in nature. The information in which alternative completes the given statement?
- neutral, acidic
 - acidic, basic
 - basic, neutral
 - basic, acidic
8. When a drop of unknown solution X is placed on a strip of pH paper, a deep red colour is produced. This sample is which one of these?
- NaOH
 - HCl
 - Water
 - CH₃COOH
9. A student tests a sample drinking water and reports its pH value as 6 at room temperature. Which one of the following might have been added in water?
- Calcium chloride
 - Sodium chloride
 - Sodium bicarbonate
 - Bleaching powder
10. Solid sodium bicarbonate was placed on a strip of pH paper. The color of the strip
- turned red
 - did not change
 - turned green and slightly yellow
 - turned pink
11. Four drops of red litmus solution were added to each of the following samples. Which one turns red litmus blue?
- Alcohol
 - Distilled water
 - Sodium hydroxide sol
 - HCl

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12. The pH of which of the following samples cannot be found directly using pH paper?
- Lemon juice
 - Dilute HCl
 - Solid sodium bicarbonate
 - Solution of a detergent.
13. Which of the following natural sources contains oxalic acid?
- lemon
 - orange
 - tomato
 - tamarind
14. The acid found in an ant sting is
- acetic acid
 - citric acid
 - tartaric acid
 - Methanoic acid
15. To relieve pain caused due to acidity, we can take
- sour milk
 - lemon juice
 - orange juice
 - milk of magnesia
16. What are the products obtained when potassium sulphate reacts with barium iodide in an aqueous medium?
- KI and BaSO_4
 - KI, Ba and SO_2
 - K, I₂ and BaSO_4
 - K, Ba, I₂ and SO_2
17. Which of the following salts is basic in nature?
- NH_4NO_3
 - Na_2CO_3
 - Na_2SO_4
 - NaCl
18. Which of the following salts has the minimum pH value?
- $(\text{NH}_4)_2\text{SO}_4$
 - NaHCO_3
 - K_2SO_4
 - NaCl

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19. You are given four unknown solutions I, II, III, and IV. The pH values of these solutions are found to be 3, 7, 8, and 10 respectively. Among the given solutions, which solution has the highest hydrogen ion concentration?

- (a) I (b) II (c) III (d) IV

20. Which one of the following is required to identify the gas evolved when dilute hydrochloric acid reacts with zinc metal?

- (a) blue litmus paper
(b) red litmus paper
(c) a burning splinter
(d) lime water

21. Zinc reacts with an acid as well as with a base to liberate hydrogen. On the basis of this what should be the nature of the zinc metal?

- (a) Basic
(b) Acidic
(c) Amphoteric
(d) Neutral

22. When you test the solutions of sodium bicarbonate, sodium hydroxide, hydrochloric acid and acetic acid with universal indicator, in which case would you get a red colour?

- (a) Sodium bicarbonate
(b) Hydrochloric acid
(c) Sodium hydroxide
(d) Acetic acid

23. The pH of a sample of pure water is 7 at room temperature. What is its pH when a pinch of solid sodium bicarbonate is dissolved in it?

- (a) vary near to 7
(b) less than 7
(c) more than 7
(d) exactly 7

24. If an unknown solution turns blue litmus red, then the pH of the solution is more likely to be

- (a) 12 (b) 10 (c) 7 (d) 4

25. What is the pH of a 0.00001 molar HCl solution?

- (a) 1 (b) 9 (c) 5 (d) 4

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26. There are alternate acid base theories that define an acid as any species that can
{hint: According to Bronsted-Lowry theory, an acid is any species that can donate a proton to another species.}
- (a) donate a proton
 - (b) donate an electron
 - (c) accept a proton
 - (d) accept an electron
27. What happens when a solution of an acid is mixed with a solution of a base in a test tube?
- (i) The temperature of the solution increases
 - (ii) The temperature of the solution decreases
 - (iii) The temperature of the solution remains the same
 - (iv) Salt formation takes place
- (a) only
 - (b) and (iii)
 - (c) and (ii)
 - (d) and (iv)
28. An aqueous solution turns red litmus solution blue. Excess addition of which of the following solution would reverse the change?
- (a) Baking powder
 - (b) Lime
 - (c) Ammonium hydroxide solution
 - (d) Hydrochloric acid
29. During the preparation of hydrogen chloride gas on a humid day, the gas is usually passed through the guard tube containing calcium chloride. The role of calcium chloride taken in the guard tube is to
- (a) absorb the evolved gas
 - (b) moisten the gas
 - (c) absorb moisture from the gas
 - (d) absorb Cl^- ions from the evolved gas
30. 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

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Arrange the pH in increasing order of hydrogen ion concentration.

31. WHO AM I?
- (a) I am called antichlor and am used to remove excess chlorine from clothes when treated with bleaching powder
 - (b) I am a product of gypsum and am used to making chalks and fire proof materials.
 - (c) I am a compound of calcium and can be used for disinfecting drinking water as well as for decolorization.
 - (d) I give different smell in acid and base solution.
 - (e) I am an oxide capable of showing properties for both acids and base.
 - (f) I am a covalent compound and conducts electricity in aqueous medium.
 - (g) I am a salt of potassium hydroxide and nitric acid.
 - (h) I am the term used when a solid becomes liquid when exposed to moist air.
 - (i) I am derived from tomato and turn blue litmus into red.
32. The colour of methyl orange indicator in acidic medium is:
- (a) Yellow
 - (b) Green
 - (c) Orange
 - (d) Red
33. The colour of phenolphthalein indicator in basic solution is:
- (a) Yellow
 - (b) Green
 - (c) Pink
 - (d) Orange
34. What is the colour of methyl orange in alkaline medium?
- (a) Orange
 - (b) Yellow
 - (c) Red
 - (d) Blue
35. A solution turns red litmus blue, its pH will be:
- (a) 1 (b) 4 (c) 5 (d) 10
36. A solution reacts with crushed egg-shells to give a gas that turns lime-water Milky, the solution contains:
- (a) NaCl
 - (b) HCl
 - (c) LiCl
 - (d) KCl

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37. Why is universal indicator a better one than litmus paper?
- (a) Litmus paper can only be used for acids.
 - (b) Litmus paper can only be used for alkalis.
 - (c) Universal indicator goes green if something is neutral.
 - (d) Universal indicator is useful for all ranges of pH of the solution.
38. Water soluble bases are known as?
- (a) Neutral
 - (b) Base
 - (c) Acid
 - (d) Alkali
39. Which one of the following pairs of substances when mixed together produces table salt?
- (a) Sodium thiosulphate and sulphur dioxide
 - (b) Hydro chloric acid and sodium hydroxide
 - (c) Chlorine and oxygen
 - (d) Nitric acid and sodium hydrogen carbonate
40. What colour would hydrochloric acid (pH=1) turn universal indicator.
- (a) Orange
 - (b) Purple
 - (c) Yellow
 - (d) Red
41. Which one of the following medicines is used for treating indigestion?
- (a) Antibiotic
 - (b) Analgesic
 - (c) Antacid
 - (d) Antiseptic
42. If magnesium reacts with hydrochloric acid, what gas is produced?
- (a) Hydrogen
 - (b) Oxygen
 - (c) Carbon dioxide
 - (d) Chlorine
43. Which of the following is the most accurate way of representing neutralization?
- (a) Acid + base \rightarrow neutral solution
 - (b) Acid + base \rightarrow salt + water
 - (c) Acid + base \rightarrow sodium chloride + hydrogen
 - (d) Acid + base \rightarrow acidic solution

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44. Classify the following examples as acid, base or salt:

- (a) $Mg(OH)_2$ (b) HCl
 (c) KCl (d) H_3PO_4
 (e) HBr (f) $Al(OH)$
 (g) KNO_2 (h) $NaCl$
 (i) $NaNO_3$ (j) $Ba(OH)_2$

45. Fill in the following blanks:

- (a) A _____ taste is a characteristic property of all acids in aqueous solution.
 (b) Acids react with some metals to produce _____ gas.
 (c) Aqueous acid solutions conduct electricity because they have ____
 (d) Acid reacts with base to produce a _____ and water.
 (e) Acid turns methyl orange to _____ colour.
 (f) Bases tend to taste _____ to feel
 (g) Aqueous basic solutions conduct electricity because they have _____.
 (h) Bases react with _____ to produce a salt and _____.
 (i) Bases turn phenolphthalein to _____ colour.

46. Match the following

(i)	Plaster of Paris	(a)	$CaOCl_2$
(ii)	Gypsum	(b)	$NaHCO_3$
(iii)	Bleaching powder	(c)	$Na_2CO_3 \cdot 10H_2O$
(iv)	Baking soda	(d)	$CaSO_4 \cdot \frac{1}{2} H_2O$
(v)	Washing soda	(e)	$CaSO_4 \cdot 2 H_2O$

47. Which of the following salts does not contain water of crystallization?

- (a) Blue vitriol
 (b) Baking soda
 (c) Washing soda
 (d) Gypsum

48. Sodium carbonate is a basic salt because it is a salt of

- (a) strong acid and strong base
 (b) weak acid and weak base
 (c) strong acid and weak base
 (d) weak acid and strong base

49. Calcium phosphate is present in tooth enamel. Its nature is

- (a) Basic (b) Acidic
 (c) Neutral (d) Amphoteric

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50. A sample of soil is mixed with water and allowed to settle. The clear supernatant solution turns the pH paper yellowish-orange. Which of the following would change the colour of this pH paper to greenish-blue?
- (a) Lemon juice (b) Vinegar (c) Common salt (d) An antacid
51. Which of the following gives the correct increasing order of acidic strength?
- (a) Water < Acetic acid < Hydrochloric acid
(b) Water < Hydrochloric acid < Acetic acid
(c) Acetic acid < Water < Hydrochloric acid
(d) Hydrochloric acid < Water < Acetic acid
52. If a few drops of a concentrated acid accidentally spills over the hand of a student, what should be done?
- (a) Wash the hand with saline solution
(b) Wash the hand immediately with plenty of water and apply a paste of sodium hydrogen carbonate
(c) After washing with plenty of water apply solution of sodium hydroxide on the hand
(d) Neutralise the acid with a strong alkali
53. Sodium hydrogen carbonate when added to acetic acid evolves a gas. Which of the following statements are true about the gas evolved?
- (i) It turns lime water milky
(ii) It extinguishes a burning splinter
(iii) It dissolves in a solution of sodium hydroxide
(iv) It has a pungent odour
- (a) (i) and (ii)
(b) (i), (ii) and (iii)
(c) (ii), (iii) and (iv)
(d) (i) and (iv)
54. Common salt besides being used in kitchen can also be used as the raw material for making
- (i) Washing soda
(ii) Bleaching powder
(iii) Baking soda
(iv) Slaked lime
- (a) (i) and (ii)
(b) (i), (ii) and (iv)
(c) (i) and (iii)
(d) (i), (iii) and (iv)

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55. One of the constituents of baking powder is sodium hydrogen carbonate, the other constituent is

- (a) Hydrochloric acid (b) Tartaric acid
(c) Acetic acid (d) Sulphuric acid

56. To protect tooth decay we are advised to brush our teeth regularly. The nature of the tooth paste commonly used is

- (a) Acidic
(b) Neutral
(c) Basic
(d) Corrosive

57. Which of the following statements is correct about an aqueous solution of an acid and of a base?

- (i) Higher the pH, stronger the acid
(ii) Higher the pH, weaker the acid
(iii) Lower the pH, stronger the base
(iv) Lower the pH, weaker the base

- (a) (i) and (iii)
(b) (ii) and (iii)
(c) (i) and (iv)
(d) (ii) and (iv)

58. The pH of the gastric juices released during digestion is

- (a) Less than 7
(b) More than 7
(c) Equal to 7
(d) Equal to 0

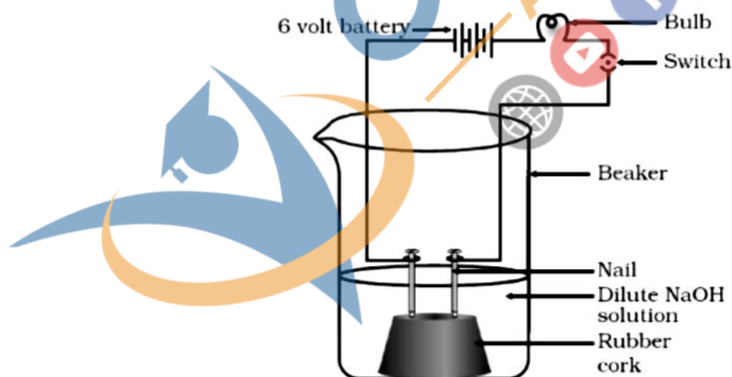
59. Which of the following phenomena occur, when a small amount of acid is added to water?

- (i) Ionisation
(ii) Neutralisation
(iii) Dilution
(iv) Salt formation

- (a) (i) and (ii)
(b) (i) and (iii)
(c) (ii) and (iii)
(d) (ii) and (iv)

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60. Which one of the following can be used as an acid–base indicator by a visually impaired student?
- Litmus
 - Turmeric
 - Vanilla essence
 - Petunia leaves
61. Which of the following substance will not give carbon dioxide on treatment with dilute acid?
- Marble
 - Limestone
 - Baking soda
 - Lime
62. Which of the following is acidic in nature?
- Lime juice
 - Human blood
 - Lime water
 - Antacid
63. In an attempt to demonstrate electrical conductivity through an electrolyte, the following apparatus (see below Figure) was set up. Which among the following statement(s) is (are) correct?



- Bulb will not glow because electrolyte is not acidic
 - Bulb will glow because NaOH is a strong base and furnishes ions for conduction.
 - Bulb will not glow because circuit is incomplete
 - Bulb will not glow because it depends upon the type of electrolytic solution
- (i) and (iii)
 - (ii) and (iv)
 - (ii) only
 - (iv) only

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64. Which of the following is used for dissolution of gold?
- Hydrochloric acid
 - Sulphuric acid
 - Nitric acid
 - Aqua regia
65. Which of the following is not a mineral acid?
- Hydrochloric acid
 - Citric acid
 - Sulphuric acid
 - Nitric acid
66. Which among the following is not a base?
- NaOH
 - KOH
 - NH₄OH
 - C₂H₅ OH
67. Which of the following statements is not correct?
- All metal carbonates react with acid to give a salt, water and carbon dioxide
 - All metal oxides react with water to give salt and acid
 - Some metals react with acids to give salt and hydrogen
 - Some nonmetallic oxides react with water to form an acid
68. Which of the following is(are) true when HCl (g) is passed through water?
- It does not ionise in the solution as it is a covalent compound.
 - It ionises in the solution
 - It gives both hydrogen and hydroxyl ion in the solution
 - It forms hydronium ion in the solution due to the combination of hydrogen ion with water molecule
- (i) only
 - (iii) only
 - (ii) and (iv)
 - (iii) and (iv)
69. Which of the following statements is true for acids?
- Bitter and change red litmus to blue
 - Sour and change red litmus to blue
 - Sour and change blue litmus to red
 - Bitter and change blue litmus to red

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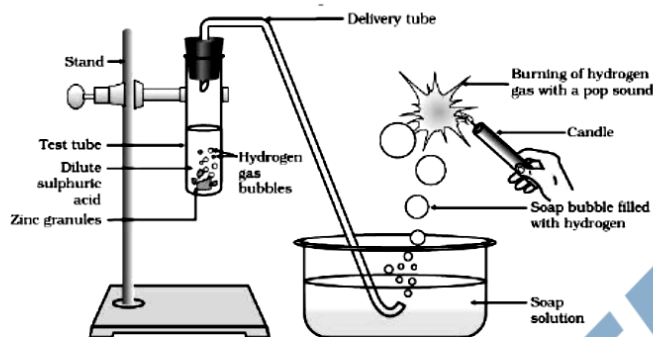
70. Which of the following are present in a dilute aqueous solution of hydrochloric acid?

- (a) $\text{H}_3\text{O}^+ + \text{Cl}^-$
- (b) $\text{H}_3\text{O}^+ + \text{OH}^-$
- (c) $\text{Cl}^- + \text{OH}^-$
- (d) Unionized HCl

71. Identify the correct representation of reaction occurring during chloroalkali process

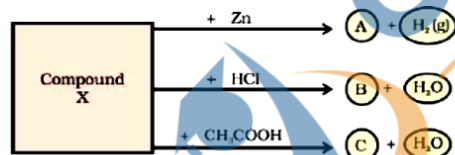
- (a) $2\text{NaCl}(\text{l}) + 2\text{H}_2\text{O}(\text{l}) \rightarrow 2\text{NaOH}(\text{l}) + \text{Cl}_2(\text{g}) + \text{H}_2(\text{g})$
- (b) $2\text{NaCl}(\text{aq}) + 2\text{H}_2\text{O}(\text{aq}) \rightarrow 2\text{NaOH}(\text{aq}) + \text{Cl}_2(\text{g}) + \text{H}_2(\text{g})$
- (c) $2\text{NaCl}(\text{aq}) + 2\text{H}_2\text{O}(\text{l}) \rightarrow 2\text{NaOH}(\text{aq}) + \text{Cl}_2(\text{aq}) + \text{H}_2(\text{aq})$
- (d) $2\text{NaCl}(\text{aq}) + 2\text{H}_2\text{O}(\text{l}) \rightarrow 2\text{NaOH}(\text{aq}) + \text{Cl}_2(\text{g}) + \text{H}_2(\text{g})$

72. In the following schematic diagram for the preparation of hydrogen gas as shown in below Figure, what would happen if following changes are made?



- (a) In place of zinc granules, same amount of zinc dust is taken in the test tube.
- (b) Instead of dilute sulphuric acid, dilute hydrochloric acid is taken.
- (c) In place of zinc, copper turnings are taken.
- (d) Sodium hydroxide is taken in place of dilute sulphuric acid and the tube is heated.

73. Identify the compound X on the basis of the reactions given below. Also, write the name and chemical formulae of A, B and C.



74. A solution of a weak acid when mixed with a solution of a strong base forms:

- (a) Acidic solution
- (b) Basic solution
- (c) Salt and Water
- (d) Neutral solution.

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75. An aqueous solution turns blue litmus solution red. Excess addition of which solution of the following solution would reverse the change:

- (a) Acetic acid
- (b) Limewater
- (c) Ammonium Hydroxide solution
- (d) Hydrochloric Acid.

76. A substance that will not give carbon-dioxide on treatment with dilute acid is:

- (a) Marble
- (b) Lime stone
- (c) Baking soda
- (d) Limewater

77. Sodium Carbonate when added to acetic acid evolves a gas. Which of the following are true about the gas evolved?

- (i) It turns lime water milky
- (ii) It puts out burning splinter
- (iii) It dissolves in sodium hydroxide solution
- (iv) It has pungent smell.

- (a) 1 & 2
- (b) 1,2 & 3
- (c) 2, 3 & 4
- (d) 1 & 4.

78. A solution turns red litmus blue: the pH is likely to be:

- (a) 1
- (b) 4
- (c) 5
- (d) 14

79. A 10 ml of solutions of NaOH is found to be completely neutralised by 8 ml. of a given solution of HCl. If we take 20 ml. of the same solution of NaOH, the amount of HCl solution (the same solution as before) required to neutralize it will be:

- (a) 4 ml
- (b) 8 ml
- (c) 12 ml
- (d) 16 ml

80. Sodium carbonate is a basic salt because it is a salt of:

- (a) Strong acid and strong base
- (b) Weak acid and weak base
- (c) Strong acid and weak base
- (d) Weak acid and strong base.

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81. Common salt besides being used in kitchen can also be used as the raw material for making:

- 1) Hydrogen
- 2) Nitrogen
- 3) Chlorine
- 4) Slaked lime

- (a) (1) and (2)
- (b) (1), (2) and (4)
- (c) (1) and (3)
- (d) (1), (3) and (4)

82. You have four test tubes, A, B, C and D containing sodium carbonate, sodium chloride, lime water and blue litmus solutions respectively. Out of these the material of which test tube / test tubes would be suitable for the correct test of acetic acid / ethanoic acid.

- (a) Only A
- (b) A and B
- (c) B and C
- (d) A and D.

83. An element common to all acids is

- (a) Chlorine
- (b) Nitrogen
- (c) Oxygen
- (d) hydrogen

84. Bases on ionisation release

- (a) Hydrogen ions
- (b) Sodium ions
- (c) Chlorine ions
- (d) Hydroxide ions

85. In general, salts

- (a) Are ionic compounds
- (b) Contain hydrogen ions

86. When aqueous solutions of an acid and a base are mixed

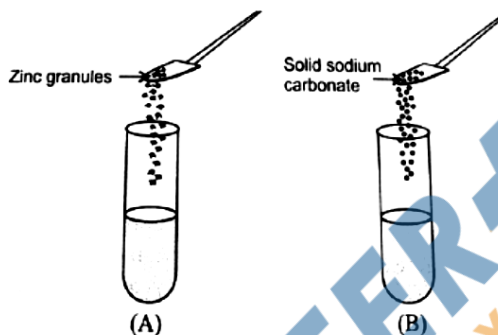
- (a) No reaction occurs
- (b) A new acid and a new base are formed
- (c) A salt and water are formed
- (d) An acid and a salt are formed

87. When magnesium and hydrochloric acid react, they produce

- (a) Oxygen and magnesium chloride
- (b) Chlorine and magnesium oxide
- (c) Hydrogen and magnesium chloride
- (d) Hydrogen and magnesium

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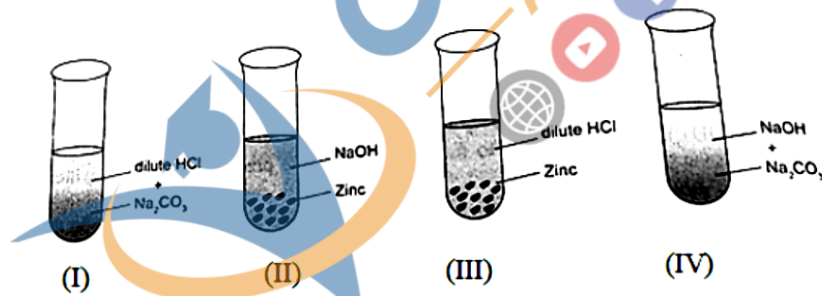
88. A student took two test tubes containing 2ml of dilute hydrochloric acid and added zinc granules to test tube (A) and solid sodium carbonate to test tube (B) as shown below



The correct observation would be:

- (a) Rapid reaction in both test tubes
- (b) Slow reaction in (A) and rapid reaction in (B)
- (c) Rapid reaction in (A) but a slow reaction in (B)
- (d) No reaction in any of the test tubes

89. Four students were asked by their teacher to arrange the set up I-IV as given below and identify the gas evolved in each case, if any.



After observation, they arrived at the following inferences and recorded their observations in the form of a table as given below:

STUDENT	I	II	III	IV
A	H ₂	No gas	CO ₂	H ₂
B	CO ₂	H ₂	No gas	CO ₂
C	CO ₂	H ₂	H ₂	No gas
D	No gas	CO ₂	CO ₂	H ₂

Find which student recorded the correct observation.



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ANSWERS

1	c
2	b
3	c
4	b
5	b
6	b
7	d
8	b
9	a
10	b
11	c
12	c
13	c
14	d
15	d
16	a
17	b
18	a
19	a
20	c
21	c
22	b
23	c
24	d
25	c
26	a
27	d
28	d
29	c
30	
A.	7
B.	11
C.	1
D.	4
9	11 < 9 < 7 < 4 < 1

31	
(a)	Sulphur Di-Oxide
(b)	Plaster Of Paris
(c)	Bleaching Powder
(d)	Olfactor Indicator
(e)	Amphoteric Oxide
(f)	Acetic Acid
(g)	Potassium Nitrate
(h)	Hygroscopic
(i)	Oxalic Acid
32	d
33	c
34	b
35	d
36	b
37	d
38	d
39	b
40	d
41	c
42	a
43	b
44	
(a)	Base
(b)	Acid
(c)	Salt
(d)	Acid
(e)	Acid
(f)	Base
(g)	Salt
(h)	Salt
(i)	Salt
(j)	Base

45	
(a)	Sour
(b)	Hydrogen
(c)	Ions
(d)	Salt
(e)	Red
(f)	Bitter
(g)	Ions
(h)	Acid, Water
(i)	Pink
46	
1.	d
2.	e
3.	a
4.	b
5.	c
47	b
48	d
49	a
50	d
51	a
52	b
53	b
54	c
55	b
56	c
57	d
58	a
59	b
60	c
61	d
62	a
63	c
64	d

65	b
66	d
67	b
68	c
69	c
70	a
71	d
72	
(a)	Fast
(b)	Hydrogen
(c)	No Displacement
(d)	Hydrogen
73	
X	NAOH
A	Sodium Zincate
B	Sodium Chloride
C	Sodium Acetate
74	b
75	c
76	d
77	b
78	d
79	d
80	d
81	c
82	d
83	d
84	d
85	a
86	c
87	c
88	a
89	Student C