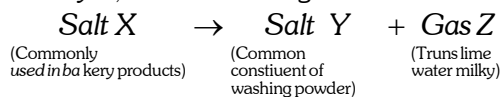


Acids, Bases and Salts

1. Identify X, Y and Z in the given reaction.



	X	Y	Z
(a)	Sodium carbonate	Water	Carbon dioxide
(b)	Sodium hydrogen carbonate	Sodium carbonate	Carbon dioxide
(c)	Sodium carbonate	Sodium chloride	Carbon dioxide
(d)	Sodium hydrogen carbonate	Calcium carbonate	Carbon dioxide

2. Match column I (different substances) with column II (pH values) and choose the correct option from the codes given below.

	Column I		Column II
P.	Tomato juice	1.	7.3-7.5
Q.	Gastric juice	2.	6.5-7.5
R.	Blood	3.	4.5 - 5.5
S.	Saliva	4.	4.0-4.4
T.	Coffee	5.	1.0 - 3.0

- (a) P-2, Q-1, R-3, S-4, T-5
 (b) P-1, Q-4, R-3, S-2, T-5
 (c) P-4, Q-5, R-1, S-2, T-3
 (d) P-2, Q-3, R-1, S-5, T-4

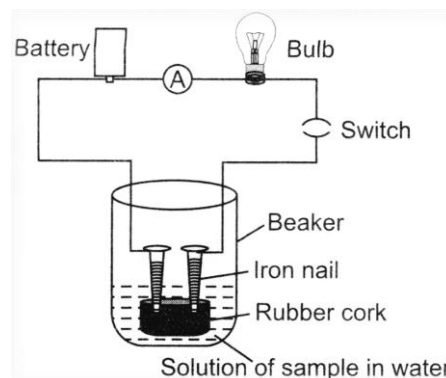
3. Certain chemical properties of a substance are given below.

- (i) It turns methyl orange red.
 (ii) It turns turmeric paper red.
 (iii) It reacts with zinc and a gas is evolved.
 (iv) It reacts with solid sodium carbonate to give brisk effervescence.

Which of the above properties are shown by dilute HCl?

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

4. Sunil set up an experiment as shown in the figure to test a few solutions which contain hydrogen but are not categorized as acids.

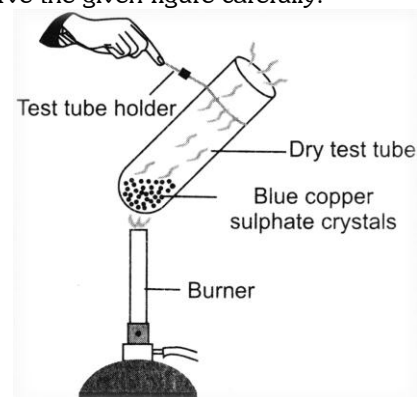


Which of the given observations are correct?

- (i) When a solution of glucose is put, the bulb does not glow.
 (ii) When a solution of ethanol is put, the bulb does not glow.
 (iii) When a solution of hydrochloric acid is put, the bulb glows.
 (iv) When a solution of sodium hydroxide is put, the bulb does not glow.

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

5. Observe the given figure carefully.



Which of the following observations are correct?

- I. A white coloured residue is left behind in the test tube.
 II. Water droplets are observed on the upper cooler part of the test tube.
 III. On adding water to the residue the colour changes to green.

- (a) I and III only (b) II and III only
 (c) I and II only (d) All of these

6. A compound is prepared from gypsum upon heating to a temperature of 373 K and it changes

back to gypsum on adding water. Which is the incorrect statement about the compound?

- (a) The compound is used for setting fractured bones.
- (b) The compound is called plaster of Paris which is calcium sulphate dehydrate with a formula $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$.
- (c) If heated at higher temperature, the compound becomes dehydrated and is called dead burnt plaster.
- (d) Both (a) and (b).

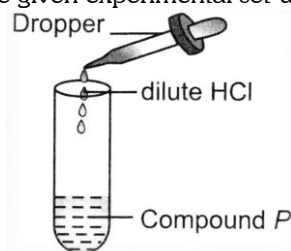
7. Choose the incorrect statement among the following.

- (a) Tamarind, tomato and sour milk are the natural sources of tartaric acid, citric acid and lactic acid respectively.
- (b) The atmosphere of Venus is made up of thick white and yellowish clouds of sulphuric acid.
- (c) Bleaching powder is used for disinfecting drinking water.
- (d) During electrolysis of brine, Cl_2 gas is given off at the anode and H_2 gas at the cathode.

8. Read the given passage and fill in the blanks by choosing an appropriate option. Bleaching powder is a i powder. When exposed to air, it reacts with ii of the air to liberate Cl_2 gas. It is iii in cold water and milkiness of the solution is due to presence of unreacted iv. It reacts with HCl and H_2SO_4 liberating v gas.

	(i)	(ii)	(iii)	(iv)	(v)
(a)	Blue crystalline	Moisture	Soluble	CO_2	SO_2
(b)	Yellowish white	CO_2	Soluble	Lime	Cl_2
(c)	White	O_2	Insoluble	Lime	Cl_2
(d)	Yellow	Moisture	Soluble	CO_2	Cl_2

9. Observe the given experimental set-up carefully.



Which of the following could be the possible observation and inference drawn?

- (a) The solution becomes blue-green due to formation of copper oxide, P is acidic.
- (b) The solution becomes blue-green due to formation of copper chloride, P is basic.
- (c) The solution becomes white due to formation of calcium hydroxide, P is basic.
- (d) The solution becomes white due to formation of calcium oxide, P is acidic.

10. Few statements regarding the properties of bases are given below. Mark the correct statements?

- (i) Sodium hydroxide and potassium hydroxide are soluble in water.
- (ii) Calcium hydroxide and magnesium hydroxide are partially soluble in water.
- (iii) All metallic hydroxides react with acids to form their respective metallic salts.
- (iv) Metallic oxides are acidic oxides hence they react with acids to form salts.

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

11. Read the given statements and mark the correct option.

Statement 1: A solution of $\text{pH} = 1$ has hydrogen ion concentration 3 times than that of solution of $\text{pH} = 3$.

Statement 2: $\text{pH} = -\log \frac{1}{[\text{H}_3\text{O}^+]}$

- (a) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
- (b) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
- (c) Statement 1 is true and statement 2 is false.
- (d) Both statements 1 and 2 are false.

12. Baking powder is a mixture of X and a mild edible acid such as Y. When it is heated, Z is produced which makes bread and cake soft and spongy. X, Y and Z are respectively

- (a) Sodium hydrogen carbonate, tartaric acid, CO_2
- (b) Sodium carbonate, acetic acid, CO_2
- (c) Sodium hydroxide, acetic acid, H_2
- (d) Sodium chloride, oxalic acid, H_2

13. A metal carbonate W on reacting with an acid gives a gas X which when passed through a solution Y gives the carbonate back. Solution Y

reacts with gas Z to form a compound P used for decolourisation.
Identify W, X, Y, Z and P.

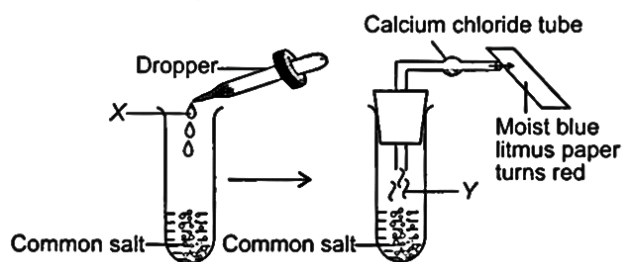
	W	X	Y	Z	P
(a)	Na_2CO_3	CO_2	NaOH	Cl_2	NaCl
(b)	MgCO_3	O_2	MgO	CO_2	MgHCO_3
(c)	K_2CO_3	O_2	KOH	CO_2	KHCO_3
(d)	CaCO_3	CO_2	Ca(OH)_2	Cl_2	CaOCl_2

14. Match column I with column II and mark the correct option from the codes given below.

	Column I		Column II
(A)	NaHCO_3	(i)	Used for disinfecting water
(B)	Na_2CO_3	(ii)	Used in soda-acid fire extinguishers
(C)	CaOCl_2	(iii)	Used for removing Permanent hardness of water
(D)	$\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$	(iv)	Used for making toys, materials for decoration

- (a) (A) - (iii), (B) - (i), (C) - (iv), (D) - (ii)
 (b) (A) - (ii), (B) - (iii), (C) - (i), (D) - (iv)
 (c) (A) - (iii), (B) - (ii), (C) - (i), (D) - (iv)
 (d) (A) - (i), (B) - (ii), (C) - (iv), (D) - (iii)

15. Study the given diagram carefully and identify X and Y respectively.



- (a) $\text{Conc. HCl}, \text{CO}_2$
 (b) $\text{Conc. H}_2\text{SO}_4, \text{HCl gas}$
 (c) $\text{Conc. HNO}_3, \text{H}_2$
 (d) $\text{Conc. NaOH}, \text{Cl}_2$

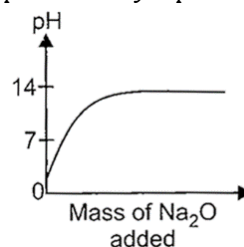
16. Ayaan tested the nature of a few common substances with phenolphthalein indicator and summarised the results in the following table.

Test tube	Colour change with phenolphthalein indicator
1	Colourless
2	Pink
3	Colourless
4	Pink

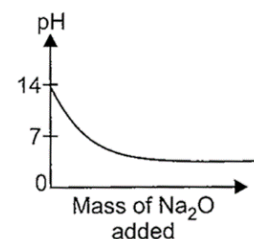
Which of the following substances could be present in test tubes 1, 2, 3 and 4?

	1	2	3	4
(a)	Lime juice	Soda water	Lime water	Vinegar
(b)	Common salt solution	Lemon juice	Vinegar	Lime water
(c)	Lemon juice	Lime water	Common salt solution	Baking soda
(d)	Baking soda	Lemon juice	Lime water	Soda water

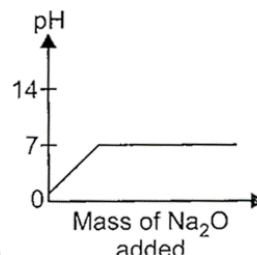
17. While demonstrating acid base reactions, Ms. Prabha, a science teacher added sodium oxide to HCl until it was in excess. Which of the following graphs correctly represents the change in pH?



(a)

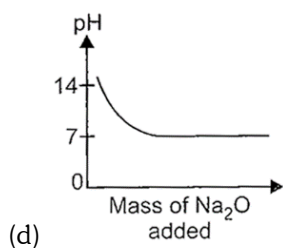


(b)



(c)

Achievers Section (HOTS)

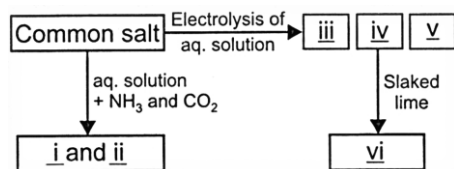


18. Aqueous solutions of salts are either acidic, basic or neutral. A few common salts are listed as :
- Silver chloride
 - Ammonium sulphate
 - Sodium nitrate
 - Sodium phosphate
 - Sodium acetate

Which of the following correctly match the given salts with the nature of their aqueous solutions?

	Solution with pH < 7	Solution with pH > 7	Solution with pH = 7
(a)	I, III	II, IV	V
(b)	I, II	IV, V	III
(c)	I	IV, II	III, V

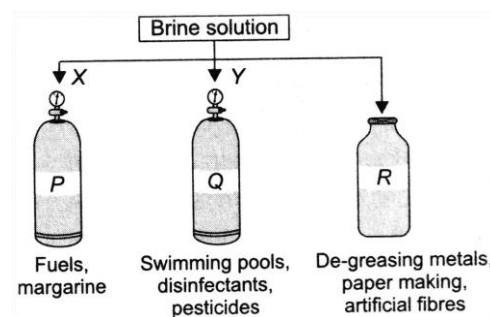
19. Study the given flow chart carefully and fill in the blanks by choosing an appropriate option.



	i	ii	iii	iv	v	vi
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(a)	NH_4OH	NaOH	O_2	Na_2O	Cl_2	$\text{Ca}(\text{OH})_2$
(b)	NH_4Cl	NaHCO_3	H_2	Cl_2	NaOH	CaOCl_2
(c)	NaOH	$(\text{NH}_4)_2\text{CO}_3$	O_2	Na_2O	H_2	CaCl_2
(d)	NH_4OH	NaOH	H_2	NaOH	H_2	CaO

20. Observe the given figure carefully, which represents the decomposition of brine solution by passing electricity.



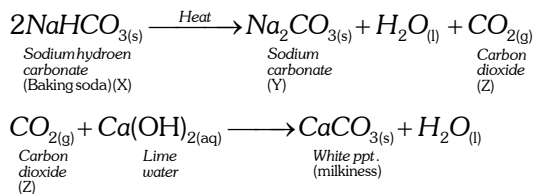
	X	Y	P	Q	R
(a)	At anode	At cathode	H_2 gas	CO_2 gas	Na_2CO_3
(b)	At anode	At cathode	NH_3 gas	H_2 gas	NH_4Cl
(c)	At cathode	At anode	Cl_2 gas	H_2 gas	NaHCO_3
(d)	At cathode	At anode	H_2 gas	Cl_2 gas	NaOH

Answer key

1. B	2. C	3. C	4. B	5. C
6. B	7. A	8. B	9. B	10. C
11. D	12. A	13. D	14. B	15. B
16. C	17. A	18. B	19. B	20. D

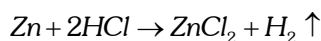
HINTS & EXPLANATION

1. (b)

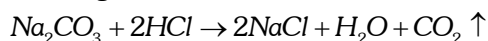


2. (c) Not Available

3. (c) HCl is an acid thus, turns methyl orange red. HCl reacts with zinc and hydrogen gas is evolved.



When HCl reacts with sodium carbonate, carbon dioxide gas is evolved with brisk effervescence.



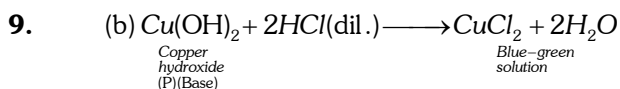
4. (b) Glucose and ethanol do not conduct electricity while NaOH and HCl conduct electricity as they produce ions in the solution.

5. (c) On adding water to the white residue, colour changes to blue due to rehydration of anhydrous copper sulphate.

6. (b) Not Available

7. (a) Tamarind contains tartaric acid, tomato contains oxalic acid and sour milk (curd) contains lactic acid.

8. (b) Not Available

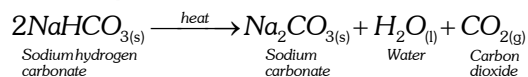


10. (c) Metallic oxides are basic oxides hence, they react with acids to form salts.

11. (d) A solution of pH = 1 has hydrogen ion concentration 100 times than that of a solution of pH = 3

$$\text{pH} = -\log[\text{H}_3\text{O}^+] = \log \frac{1}{[\text{H}_3\text{O}^+]}$$

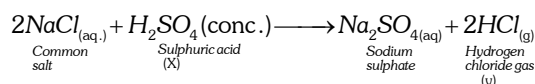
12. (a) Baking powder is a mixture of baking soda (sodium hydrogen carbonate) and a mild edible acid such as tartaric acid. When baking powder is heated, carbon dioxide (CO_2) gas is produced which causes bread or cake to rise, making them soft and spongy.



13. (d) Not Available

14. (b) Not Available

15. (b)



Dry HCl gas turns moist blue litmus paper red as it is acidic in nature.

16. (c) Phenolphthalein remains colourless in acidic solution (lemon juice) and neutral solution (common salt solution). In basic solution (lime water and baking soda) it turns pink.

17. (a) pH of HCl is below 7. When Na_2O is added, pH increases till neutralisation point and then further increases due to excess of Na_2O which is basic.

18. (b) Silver chloride (salt of weak base and strong acid) - Acidic
Ammonium sulphate (salt of weak base and strong acid) - Acidic
Sodium nitrate (Salt of strong acid and strong base) - Neutral
Sodium phosphate (Salt of strong base and weak acid) - Basic
Sodium acetate - (Salt of strong base and weak acid) - Basic

19. (b) Not Available

20. (d) Not Available