



CLASS VII CHAPTER – ACIDS, BASES, AND SALTS

Q1: State differences between acids and bases.

Answer:

SNo.	Properties	Acids	Bases
1.	Taste	Sour Taste	Bitter Taste
2.	Litmus Test	Turn blue litmus into red.	Turn red litmus into blue
3.	Dissolved in water	Give H^+ ions (responsible for its acidic nature)	Give OH^- ions (responsible for its basic nature)
4.	Action with metals	Give Hydrogen Gas	Generally do not react.
5.	Action with Ammonium Salt	Do not react	Give ammonia gas
6.	Action with phenolphthalein	Do not give any colour.	Give pink colour
7.	Action with methyl orange	Give red colour.	Give yellow colour.
8.	Absorb Carbon dioxide	Do not absorb CO_2 gas.	Some bases like NaOH absorb CO_2 gas.
9.	Naturally Found	Vinegar, Curd, Citrus fruits, HCl etc.	Lime Water, Soap, Milk of Magnesia etc.





Q2: Ammonia is found in many household products, such as window cleaners. It turns red litmus blue. What is its nature?

Answer: Since it turns red litmus blue, Ammonia is basic in nature.

Q3: Name the source from which litmus solution is obtained. What is the use of this solution?

Answer: Litmus is extracted from plant lichens. It has a mauve (purple) colour when dissolved in distilled water. Litmus solution is used to detect acidic or basic nature of any substance. When added to an acidic solution, it turns red and when added to a basic solution, it turns blue.

Q4: Is the distilled water acidic/basic/neutral? How would you verify it?

Answer: Distilled water is neutral by nature. We can verify by performing litmus paper test. It neither turns blue litmus into red. Nor it turns red litmus into blue.

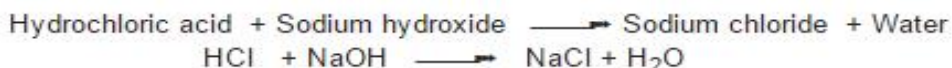
(Note: Some books or guides mention to taste it whether sour or bitter. This is a wrong and dangerous procedure. We should only taste it once we are sure it is eatable/drinkable. Not an appropriate answer. Discuss it with your teacher.)

Q5. Describe the process of neutralisation with the help of an example.

Answer: The reaction between an acid and a base is known as neutralisation. Salt and water are produced in this process with the evolution of heat.



For example, when Hydrochloric acid (HCl) reacts with a base Sodium hydroxide (NaOH), it forms a salt (Sodium Chloride) and Water (H₂O).



Q6. Mark 'T' if the statement is true and 'F' if it is false:

(i) Nitric acid turn red litmus blue. (T/F)

(ii) Sodium hydroxide turns blue litmus red. (T/F)

(iii) Sodium hydroxide and hydrochloric acid neutralise each other and form salt and water. (T/F)



(iv) Indicator is a substance which shows different colours in acidic and basic solutions. (T/F)

(v) Tooth decay is caused by the presence of a base. (T/F)

Answer:

(i) Nitric acid turn red litmus blue. **x (False)**

(ii) Sodium hydroxide turns blue litmus red. **x (False)**

(iii) Sodium hydroxide and hydrochloric acid neutralise each other and form salt and water. **✓(True)**

(iv) Indicator is a substance which shows different colours in acidic and basic solutions. **✓(True)**

(v) Tooth decay is caused by the presence of a base. **x (False)**

Q7. Dorji has a few bottles of soft drink in his restaurant. But, unfortunately, these are not labelled. He has to serve the drinks on the demand of customers. One customer wants acidic drink, another wants basic and third one wants neutral drink. How will Dorji decide which drink is to be served to whom?

Answer: Dorji can use indicators to test which drink is acidic or basic. He can perform litmus paper test. By poring few drops of drink on blue litmus and red litmus paper strip. If the blue litmus paper turns red, that drink is acidic. If red litmus paper turns blue, the drink is basic.

Q8. Explain why:

(a) An antacid tablet is taken when you suffer from acidity.

(b) Calamine solution is applied on the skin when an ant bites.

(c) Factory waste is neutralised before disposing it into the water bodies.

Answer:

(a) Due to spicy food, our stomach releases excess of hydrochloric acid which causes acidity or indigestion. An antacid tablet consists of a base like Milk of Magnesia (magnesium hydroxide). It neutralises the effect of excessive acid and brings relief.



(b) The sting of an ant contains formic acid which causes irritation on the skin. Calamine solution contains zinc carbonate which is a base. Calamine solution neutralizes the acid effect of the ant bite when applied on the skin.

(c) The wastes of many factories contain acids. If they are allowed to flow into the water bodies, the acids will kill fish and other organisms. The factory wastes are, therefore, neutralised by adding basic substances.

Q9. Three liquids are given to you. One is hydrochloric acid, another is sodium hydroxide and third is a sugar solution. How will you identify them? You have only turmeric indicator.

Answer: Turmeric is yellow in colour. When a base is added to it, the solution turns into pink colour.

However turmeric remains yellow when an acid or neutral solution is added to it. We shall perform the following steps to identify the solution is base, acid or neutral.

1. Take few drops from each solution and test it with turmeric solution. If the solution turns into pink colour that solution is base i.e. Sodium Hydroxide. Mark that beaker (containing solution) as BASE.
2. Take a test tube and add few drops of BASE solution and second solution. Check if test tube becomes warm and then add turmeric solution to it. If the colour does not change, it means the solution added is acidic (HCl). The test tube becomes warm due to neutralization.
3. If the test tube of the above solution does not warm and it does show pink colour when turmeric is added, the second solution is neutral.
4. Repeat step 2 and 3 for the third solution and identify if it is acid or neutral.

Q10. Blue litmus paper is dipped in a solution. It remains blue. What is the nature of the solution? Explain.

Answer: If a blue litmus paper when dipped in a solution, remains blue, it implies the solution is either basic or neutral.

Q11. Consider the following statements:

- (a) Both acids and bases change colour of all indicators.
- (b) If an indicator gives a colour change with an acid, it does not give a change with a base.
- (c) If an indicator changes colour with a base, it does not change colour with an acid.
- (d) Change of colour in an acid and a base depends on the type of the indicator.



Which of these statements are correct?

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

Answer: (iv) only d

Explanation: All indicators do not change colour of acids as well as bases. E.g. turmeric change colour of base into pink but it remains yellow with acid. Therefore, statement (a) is incorrect. There are indicators which change colour with both acid and base. e.g. methyl orange, litmus. Thus statement (b) and (c) are also incorrect. Statement (d) is the correct conclusion about indicators.

Q12: What are indicators? Why do we use it? Give examples.

Answer: Indicators are the special type of substances which are used to identify acids, bases and neutral solutions by showing colour changes. We use indicator because we cannot check nature of every substance by tasting it.

Few examples of indicators are: litmus, turmeric, China rose extract, phenolphthalein, methyl orange etc.

Q13: What are organic acids?

Answer: The acids which are found in plants and animals are commonly called organic acids. Examples, vinegar contains acetic acid, lemon contains citric acid.

Q14: Identify the organic acid present in the following:

- (a) Citrus fruits like lemons, oranges
- (b) Stings of bees and ants
- (c) Curd
- (d) Rancid butter
- (e) Tamarind
- (f) Apples
- (g) Tomato
- (h) Fats
- (i) Bile juice
- (j) Genetic Material in biological cell
- (k) Vinegar
- (l) Urine



Answer:

- (a) Citrus fruits like lemons, oranges - Citric Acid
- (b) Stings of bees and ants - Formic acid
- (c) Curd - Lactic Acid
- (d) Rancid butter - Butyric acid
- (e) Tamarind - Tartaric acid
- (f) Apples - Mallic Acid
- (g) Tomato - Oxalic Acid
- (h) Fats - Stearic acid
- (i) Bile juice - Cholic acid
- (j) Genetic Material in biological cell - Nucleic Acid (DNA and RNA)
- (k) Vinegar - Acetic acid
- (l) Urine - Uric Acid

Q15: What are salts? Are they acidic, basic or neutral? Give examples.

Answer: Salts are the ionic compounds generally formed by the neutralisation of an acid with a base. They can be acidic, basic or neutral.

Examples of salts are:

- (a) Acidic salts: sodium bicarbonate
- (b) Basic salts: magnesium chloride
- (c) Neutral Salts: Sodium chloride, potassium chloride
- (d) Mixed Salts: bleaching powder, potash alum

Q16: Give chemical names of following common bases used in daily life. List their uses as well.

- (a) Caustic soda
- (b) Slaked lime
- (c) Milk of magnesia
- (d) Quicklime
- (e) Caustic potash

Answer:

- a) Caustic soda : Sodium hydroxide (making soaps and detergents)
- (b) Slaked lime: Calcium hydroxide (disinfectant, bleaching powder, white wash)
- (c) Milk of magnesia: Magnesium hydroxide (antacid)
- (d) Quicklime: Calcium oxide (making cement and paper)
- (e) Caustic potash: Potassium hydroxide (making soaps, electrolysis)