CBSE Important Questions for Class 10 Science Chapter 2: Here are some CBSE Important Questions for Class 10 Science Chapter 2 Acids, Bases, and Salts which focus on important concepts crucial for understanding the properties and reactions of these substances.

Students should be familiar with definitions, characteristics and everyday examples of acids and bases such as hydrochloric acid and sodium hydroxide. Moreover, these questions help students become familiar with the exam pattern, improve their problem-solving skills and build confidence for the actual examination. Solving them thoroughly will ensure a strong grasp of the chapter and enhance overall performance in the subject.

CBSE Important Questions for Class 10 Science Chapter 2 Overview

Here is an overview of the CBSE Important Questions for Class 10 Science Chapter 2 Acids, Bases, and Salts. These solutions are prepared by subject experts from Physics Wallah ensuring clarity and accuracy in addressing the fundamental concepts of the chapter.

By studying these important questions and their detailed solutions students can strengthen their grasp of the concepts and enhance their performance in examinations.

CBSE Important Questions for Class 10 Science Chapter 2 PDF

Here is a detailed resource for CBSE Important Questions for Class 10 Science Chapter 2 Acids, Bases, and Salts.

By reviewing these questions students can enhance their understanding and prepare effectively for their exams. The PDF link is available below for easy access to this valuable study material.

CBSE Important Questions for Class 10 Science Chapter 2 PDF

CBSE Important Questions for Class 10 Science Chapter 2 Acids, Bases and Salts

Here we have provided CBSE Important Questions for Class 10 Science Chapter 2 Acids, Bases and Salts-

Matching Answer Type Questions

Note: Match the items of Column A and Column B in the following questions.

Q1. Match the acids given in Column (A) with their correct source given in Column (B)

Column A	Column B
Lactic acid	Tomato
Acetic acid	Lemon
Citric acid	Vinegar
Oxalic acid	Curd

Answer:

Column A	Column B
Lactic acid	Curd
Acetic acid	Vinegar
Citric acid	Lemon
Oxalic acid	Tomato

Q2. Match the important chemicals given in Column (A) with the chemical formulae given in Column (B).

Column A	Column B
Plaster of Paris	$Ca(OH)_2$
Gypsum	$CaSO_4 . ½ H_2O$
Bleaching Powder	$CaSO_4 . 2 H_2O$
Slaked Lime	$CaOCl_2$

Answer:

Column A	Column B
Plaster of Paris	$CaSO_4 . ½ H_2O$
Gypsum	$CaSO_4 . 2 H_2O$
Bleaching Powder	$CaOCl_2$

Slaked Lime **$Ca(OH)_2$**

Short Answer Type Questions

Q1. What will be the action of the following substances on litmus paper?

- Dry HCl gas
- Moistened NH_3 gas
- Lemon juice
- Carbonated soft drinks
- Curd
- Soap solution

Answer:

Dry HCl Gas: Effect on Litmus: No effect (does not change color).

Moistened NH3 Gas: Effect on Litmus: Turns red litmus blue (alkaline in nature).

Lemon Juice: Effect on Litmus: Turns blue litmus red (acidic in nature).

Carbonated Soft Drinks: Effect on Litmus: Turns blue litmus red (contains carbonic acid).

Curd: Effect on Litmus: Turns blue litmus red (contains lactic acid).

Soap Solution: Effect on Litmus: Turns red litmus blue (alkaline in nature).

Q2. Name the acid present in ant sting and give its chemical formula. Also, give the common method to get relief from the discomfort caused by the ant sting.

Answer:

The acid present in an ant sting is **formic acid**, also known as **methanoic acid**. Its chemical formula is **HCOOH**.

Relief from Discomfort Caused by Ant Sting

To relieve the discomfort caused by an ant sting, you can use the following methods:

Baking Soda (Sodium Bicarbonate): Apply a paste made from baking soda and water to the affected area. Baking soda is basic and helps neutralize the acidic effect of formic acid, providing relief from pain and irritation.

Calamine Solution: Apply calamine lotion, which contains zinc carbonate. It helps soothe the skin and neutralizes the acid effect of the sting.

Q3. What happens when nitric acid is added to the eggshells?

Answer:

Eggshells contain calcium carbonate. Calcium carbonate reacts with nitric acid to form calcium nitrate and carbon dioxide gas.

$CaCO_3$ (s) + HNO_3 (aq) → $CaNO_3$ (aq) + CO_2 (g) + H_2O (l)

Q4. A student prepared solutions of (i) an acid and (ii) a base in two separate beakers. She forgot to label the solutions, and litmus paper was not available in the laboratory. Since both the solutions are colourless, how will she distinguish between the two?

Answer:

To distinguish between two colorless solutions one an acid and the other a base without using litmus paper, the student can employ indicators such as phenolphthalein, turmeric, or China rose. By adding a few drops of phenolphthalein to each solution, the student can observe that the solution turning pink indicates the presence of a base while the solution remaining colorless signifies an acid.

Alternatively, using turmeric paper will show that the paper turns red in the presence of a base, whereas it remains unchanged in an acidic solution. Similarly, a China rose solution can be used; the solution that turns dark pink (magenta) indicates acidity, while the one that turns green indicates a basic nature. These simple methods enable the student to identify the solutions accurately.

Q5. How would you distinguish between baking powder and washing soda by heating?

Answer:

Baking soda ($NaHCO_3$) liberates carbon dioxide gas on heating, confirmed by passing it in lime water. Whereas on heating washing soda $Na_2CO_3.10H_2O$ water of crystallisation is given out, the salt becomes anhydrous.

Reaction:

2 $NaHCO_3$ → Na_2CO_3 + H_2O + CO_2

$Na_2CO_3.10H_2O$ → Na_2CO_3 + 10 H_2O

Q6. Salt A is commonly used in bakery products on heating gets converted into another salt B, which is used to remove the hardness of water, and a gas C is evolved. The gas C, when passed through lime water, turns it milky. Identify A, B and C.

Answer:

Baking powder is the salt used in bakery products that give sodium carbonate, and carbon dioxide gas on heating.

$2\ NaHCO_3 \rightarrow Na_2CO_3 + H_2O + CO_2$

Sodium carbonate is used to remove the hardness of the water.

Carbon dioxide turns lime water milky due to the formation of insoluble calcium carbonate.

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

Thus, A is sodium bicarbonate (Baking powder), B is sodium carbonate, and C is carbon dioxide gas.

Q7. In one of the industrial processes used to manufacture sodium hydroxide, a gas X is formed as a byproduct. The gas X reacts with lime water to give a compound Y used as a bleaching agent in the chemical industry. Identify X and Y giving the chemical equation of the reactions involved.

Answer:

Sodium chloride is used to manufacture sodium hydroxide, called the chloralkali process. In this process, chlorine and hydrogen gas are formed as byproducts and sodium hydroxide.

$2\ NaCl\ (aq) + 2H_2O\ (l) \rightarrow 2\ NaOH\ (aq) + Cl_2\ (g) + H_2\ (g)$

Chlorine gas gives bleaching power when it reacts with lime water and is used as a bleaching agent in chemical industries.

$Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$.

Therefore, the gas X is chlorine. Compound Y is calcium oxychloride, commonly known as bleaching powder and is used as a bleaching agent in chemical industries.

Q8. Fill in the missing data in the following table.

S. No.	Name of the salt	Formula	Salt obtained from	
			Base	Acid
1.	Ammonium chloride	NH_4Cl	NH_4OH	–
2.	Copper sulphate	–	–	H_2SO_4
3.	Sodium chloride	NaCl	NaOH	–
4.	Magnesium nitrate	$Mg(NO_3)_2$	–	HNO_3

5.	**Potassium sulphate**	**K_2SO_4**	**–**	**–**
6.	**Calcium nitrate**	**$Ca(NO_3)_2$**	**$Ca(OH)_2$**	**–**

Answer:

S. No.	**Name of the salt**	**Formula**	**Salt obtained from**	
			Base	**Acid**
1.	**Ammonium chloride**	**NH_4Cl**	**NH_4OH**	**HCl**
2.	**Copper sulphate**	**$CuSO_4$**	**$Cu(OH)_2$**	**H_2SO_4**
3.	**Sodium chloride**	**NaCl**	**NaOH**	**HCl**
4.	**Magnesium nitrate**	**$Mg(NO_3)_2$**	**$Mg(OH)_2$**	**HNO_3**
5.	**Potassium sulphate**	**K_2SO_4**	**KOH**	**H_2SO_4**
6.	**Calcium nitrate**	**$Ca(NO_3)_2$**	**$Ca(OH)_2$**	**HNO_3**

Q9. What are strong and weak acids? In the following list of acids, separate strong acids from weak acids. Hydrochloric acid, citric acid, acetic acid, nitric acid, formic acid, sulphuric acid.

Answer:

Strong acids are those that completely ionize in an aqueous solution, meaning they dissociate entirely into their ions. This results in a high concentration of hydrogen ions (H^+) in the solution, leading to a low pH. On the other hand, weak acids only partially ionize in solution, resulting in a lower concentration of hydrogen ions and a higher pH compared to strong acids.

Classification of Acids:

Strong Acids:

- Hydrochloric acid (HCl)
- Nitric acid (HNO_3)
- Sulphuric acid (H_2SO_4)

Weak Acids:

- Citric acid ($C_6H_8O_7$)

- Acetic acid (CH_3COOH)
- Formic acid (HCOOH)

Q10. When zinc metal is treated with a dilute solution of a strong acid, a gas is evolved, which is utilised in the hydrogenation of oil. Name the gas evolved. Write the chemical equation of the reaction involved and also write a test to detect the gas formed.

Answer:

Zinc metal gives hydrogen gas when treated with dilute sulphuric acid. Hydrogen gas is utilised in the hydrogenation of oil.

$Zn + 2\ HCl \rightarrow ZnCl_2 + H_2$.

Therefore, the gas that evolved is hydrogen.

Test for hydrogen gas: When a burning candle is brought near the hydrogen gas, it burns with a pop sound that confirms hydrogen gas's presence.

Long Answer Type Questions

Q1. In the following schematic diagram for the preparation of hydrogen gas as shown in Figure 2.3, what would happen if following changes are made?

(a) In place of zinc granules, the 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.

Answer:

(a) If zinc dust is used instead of zinc granules, the reaction rate will increase. This is because zinc dust has a larger surface area compared to zinc granules, allowing for a faster reaction with the acid. The increased surface area facilitates more effective collisions between the reactants, leading to a quicker generation of hydrogen gas.

$Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$

(b) If dilute hydrochloric acid is used instead of dilute sulphuric acid the reaction will still proceed, resulting in the evolution of hydrogen gas. Hydrochloric acid is a strong acid that reacts with zinc producing zinc chloride and hydrogen gas:

$Zn + 2\ HCl \rightarrow ZnCl_2 + H_2$

(c) If copper turnings are used in place of zinc, no hydrogen gas will be produced. Copper is less reactive than zinc and does not react with dilute sulphuric acid or dilute hydrochloric acid under normal conditions. Therefore, there will be no reaction and no hydrogen gas evolution.

(d) If sodium hydroxide is used instead of dilute sulphuric acid and the tube is heated, a reaction will occur between zinc and sodium hydroxide. This will produce sodium zincate and hydrogen gas:

$Zn + 2\ NaOH \rightarrow Na_2ZnO_2 + H_2$

Q2. For making cake, baking powder is taken. If your mother uses baking soda instead of baking powder in cake at home,

(a) How will it affect the taste of the cake and why?

(b) How can baking soda be converted into baking powder?

(c) What is the role of tartaric acid added to baking soda?

Answer:

(a) If baking soda is used instead of baking powder, the taste of the cake will become bitter. This bitterness arises because, upon heating, baking soda (sodium bicarbonate) decomposes to form sodium carbonate, which has a bitter flavor. The reaction is as follows:

$2\ NaHCO_3 + Heat \rightarrow Na_2CO_3 + CO_2 + H_2O$

(b) Baking soda can be converted into baking powder by adding an edible weak acid, such as tartaric acid, to the baking soda. This mixture creates a dry acid-base reaction that activates when moisture is introduced, allowing for leavening during baking.

(c) The role of tartaric acid added to baking soda is to provide a source of hydrogen ions when it dissolves in water. These hydrogen ions react with sodium bicarbonate to release carbon dioxide gas, which helps the cake rise and become fluffy.

Q3. A metal carbonate X reacting with acid gives a gas that gives the carbonate back when passed through a solution Y. On the other hand, a gas G obtained at the anode during electrolysis of brine is passed on dry Y, it gives a compound Z, used for disinfecting drinking water. Identity X, Y, G and Z.

Answer:

Here, X is calcium carbonate ($CaCO_3$), Y is slaked lime [$Ca(OH)_2$], Z is bleaching powder ($CaOCl_2$), and G is chlorine (Cl_2) gas.

When calcium carbonate ($CaCO_3$) reacts with HCl, it liberates carbon dioxide gas.

$CaCO_3 + HCl \rightarrow CaCl_2 + CO_2 + H_2O$

When CO_2 is passed into lime water [$Ca(OH)_2$], it turns milky due to the formation of Calcium carbonate ($CaCO_3$).

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

Hence, solution Y is lime water.

When chlorine (Cl_2) gas is passed on dry lime water, it gives bleaching powder which is used for disinfecting water.

$Cl_2 + Ca(OH)_2 \rightarrow CaOCl_2 + H_2O$

Q4. A dry pellet of a common base B absorbs moisture and turns sticky when kept open. The compound is also a by-product of the chloralkali process. Identify B. What type of reaction occurs when B is treated with an acidic oxide? Write a balanced chemical equation for one such solution.

Answer:

Sodium hydroxide (NaOH) is a commonly used base and is hygroscopic; it absorbs moisture from the atmosphere and becomes sticky. A neutralisation reaction occurs when acidic oxides react with the base to give salt and water.

$2\ NaOH + CO_2 \rightarrow Na_2CO_3 + H_2O$

Q5. A sulphate salt of Group 2 element of the Periodic Table is a white, soft substance, which can be moulded into different shapes by making its dough. When this compound is left open for some time, it becomes a solid mass and cannot be used for moulding purposes. Identify the sulphate salt and why does it show such behaviour? Give the reaction involved.

Answer:

Calcium belongs to group 2. Calcium sulphate is a soft white substance. It is known as the Plaster of Paris, which can be moulded into different shapes by making its dough.

When the Plaster of Paris is left open, it turns into a solid mass because of a reaction with moisture present in the atmosphere. The solid mass so formed is known as gypsum and cannot be further used for moulding.

$CaSO_4.\ ½\ H_2O + 1.5\ H_2O \rightarrow CaSO_4.\ 2\ H_2O$

Plaster of Paris shows such behaviour because of half water molecules as water of crystallisation. It absorbs moisture from the atmosphere and forms gypsum, a hard solid mass when left open for some time.

Q6. Identify the compound X based on the reactions given below. Also, write the name and chemical formulae of A, B and C.

Answer:

Here, X is sodium hydroxide (NaOH), A is sodium zincate (Na_2ZnO_2), B is sodium chloride (NaCl), and C is sodium acetate (CH_3COONa).

$NaOH + Zn \rightarrow Na_2ZnO_2 + H_2$

$NaOH + HCl \rightarrow NaCl + H_2O$

$NaOH + CH_3COOH \rightarrow CH_3COONa + H_2O$

Benefits of CBSE Important Questions for Class 10 Science Chapter 2

- **Focused Revision**: These important questions highlight important concepts and areas that are frequently asked in exams allowing students to concentrate their revision efforts on relevant topics.
- **Enhanced Understanding**: Working through these questions helps reinforce the understanding of fundamental concepts such as the properties of acids and bases their reactions and their applications in everyday life.
- **Improved Problem-Solving Skills**: Practicing important questions enables students to develop their analytical and problem-solving skills which are important for tackling complex scientific problems.
- **Exam Preparedness**: Familiarity with important questions prepares students for the exam format and types of questions they may encounter reducing anxiety and boosting confidence.
- **Time Management**: By practicing important questions students can improve their time management skills during exams ensuring they can answer all questions within the allotted time.
- **Self-Assessment**: Working through these questions allows students to assess their knowledge and identify areas where they may need further study or clarification.