14.SALTS - TYPES AND USES

SOLUTIONS

TEACHING TASK

JEE MAINS LEVEL QUESTIONS

1. The salt of strong acids and weak bases give

1) Basic solution 2) Neutral solution 3) Acidic solution 4) None

Answer:3

Solution:Salts formed from strong acids (e.g., HCl, HNO_3) and weak bases (e.g., NH_4OH) hydrolyze in water, releasing H^+ ions and making the solution acidic.

2. Formula of Dolamite

1) $CaCO_3$ 2) $CaCO_3$ $MgCO_3$ 3) $MgCO_3$ 4) $CaCO_3$ MgO

Answer:2

Solution:Dolomite is a double carbonate mineral with the formula $CaMg(CO_3)_2$ or $CaCO_3 \cdot MgCO_3$.

3. Which of the following salt is double salt ?

1) Potssium sulphate 2) Sodium chloride 3) Potash Alum 4) Sodium sulphate

Answer:3

Solution:Potash alum ($K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$) is a double salt (dissociates into multiple ions in water).

4. Which of the following is salt of sulphurous acid ?

1) $KHSO_4$ 2) $NaHSO_4$ 3) $KHCO_3$ 4 $NaHSO_3$

Answer:4

Solution:Sulphurous acid (H_2SO_3) forms bisulfite (HSO_3^-) and sulfite (SO_3^{2-}) salts. $NaHSO_3$ (sodium bisulfite) is derived from H_2SO_3.

5. Which of the following is salt of carbonic acid ?

1) K_2CO_3 2) KCl 3) $CaCl_2$ 4) NaCl

Answer:1

Solution:Carbonic acid (H_2CO_3) forms carbonate (CO_3^{2-}) and bicarbonate (HCO_3^-) salts.

K_2CO_3 (potassium carbonate) is a salt of H_2CO_3.

6. $K_2SO_4.Al(SO_4)\ .24H_2O$

1) Mohr's salt 2) Potash Alum 3) Dolomite 4) Blue vitriol

Answer:2

Solution:This is the formula of potash alum, a double salt used in water purification.

7. $KHSO_4 + KOH \rightarrow$

1) K_2SO_4 2) $KHSO_3$ 3) K_2HSO_4 4) None

Answer:1

Solution:$KHSO_4 + KOH \rightarrow K_2SO_4 + H_2O$

8. Which of the following is basic lead nitrate is

1) $Pb(OH)NO_3$ 2) $PbNO_3$ 3) $Pb(H)NO_3$ 4) $Pb(NO_3)_2$

Answer:1

Solution:Basic lead nitrate contains both OH^- and NO_3^- groups.

$Pb(OH)NO_3$ is the correct formula.

9. $CuCl_2$ is a

1) Acid 2) Base 3) Salt 4) Acidic salt

Answer:3

Solution:$CuCl_2$ is a neutral salt (formed from HCl + $Cu(OH)_2$).

It does not hydrolyze significantly to produce acidic/basic solutions.

10. Which of the following is Dolomite ?

1) $CaCO_3MgCO_3$ 2) $CaCO_3$ 3) $MgCO_3$ 4) $Ca(CO_C)$

Answer:1

Solution:Dolomite is $CaMg(CO_3)_2$.

JEE ADVANCED LEVEL QUESTIONS

Multi correct answer type:

11. Which of the following salts are formed from Nitric acid ?

1) $NaNO_3$ 2) KNO_3 3) $NaNO_3$ 4) KNO_2

Answer:1,2,3

Solution:Nitric acid (HNO_3) forms nitrate (NO_3^-) salts when neutralized with bases.

$NaNO_3$: Formed by $HNO_3 + NaOH \rightarrow NaNO_3 + H_2O$

KNO_3: Formed by $HNO_3 + KOH \rightarrow KNO_3 + H_2O$

KNO_2 is derived from nitrous acid (HNO_2), not nitric acid (HNO_3).

Statement Type:

A) Both Statements are true, Statement II is the correct explanation of Statement I.

B) Both Statements are true, Statement II is not correct explanation of Statement I.

C) Statement I is true, Statement II is false.

D) Statement I is false, Statement II is true.

12. Statement-I : $MgCO_3$ is a carbonic salt.

Statement-II : Carbonic Salt is prepared from carbonic acid.

Answer:A

Solution:$MgCO_3$ (magnesium carbonate) is indeed a salt of carbonic acid (H_2CO_3), making Statement I true.

Statement II correctly explains that carbonic salts are derived from carbonic acid, which is the case for $MgCO_3$.

13. Statement-I : Cu(OH)Cl is a basic copper chloride.

Statement-II : Basic salts are formed from weak acid and strong base.

Answer:B

Solution:Cu(OH)Cl is correctly identified as a basic salt (Statement I is true).

While Statement II is generally true about basic salt formation, it doesn't specifically explain why Cu(OH)Cl is basic. The basic nature of Cu(OH)Cl comes from containing both OH^- and Cl^- groups, not just from being derived

from a weak acid and strong base.

Comprehension Type:

The salt formed by the partial replacement of replaceable hydrogen ions of an acid by a basic radicals is called acid salts.

14. Na_2HPO_4 is a

1) Acidic salt 2) Basic salt 3) Normal salt 4) Acid

Answer:1

Solution:Analysis of Na_2HPO_4:

Derived from phosphoric acid (H_3PO_4) by replacing two H^+ ions with Na^+, leaving one replaceable H^+.

Formula: HPO_4^{2-} (still has one acidic hydrogen).

Thus, it is an acidic salt.

15. The salt of strong acid and weak base is

1) Acidic salt 2) Basic salt 3) Normal salt 4) Acid

Answer:1

Solution:Salts from strong acid + weak base hydrolyze in water to release H^+ ions, making the solution acidic.

Integer Type:

16. Mohr's salt contains ..... number of water molecules

Answer:6

Solution:Mohr's salt is a double salt with the chemical formula:

$FeSO_4 \cdot (NH_4)_2SO_4 \cdot 6H_2O$

It contains 6 water molecules ($6H_2O$) per formula unit.

The full name is Ammonium Iron(II) Sulfate hexahydrate.

Matrix Matching Type :

17. Acid	Salt
a) Sulphuric acid	1) CH_3COONa
b) Nitric acid	2) $MgSO_4$
c) Acetic acid	3) $Ca(NO_3)_2$
d) Phosphoric acid	4) Na_3PO_4

Answer:a-2,b-3,c-1,d-4

Solution: Acid	Salt
a) Sulphuric acid	2) $MgSO_4$
b) Nitric acid	3) $Ca(NO_3)_2$
c) Acetic acid	1) CH_3COONa
d) Phosphoric acid	4) Na_3PO_4

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS

1. A substance formed by the partial or complete neutralisation of acid and base

is called

1) acid 2) base 3) salt 4) Hydronium ion

Answer:3

Solution:Salts are formed via acid-base neutralization reactions

2. The salts of Hydrochloric are called

1) Sulphates 2) Chlorides 3) Nitrates 4) Carbonates

Answer:2

Solution:Hydrochloric acid (HCl) forms chloride salts, e.g., NaCl, KCl.

3. Salts are exist in

1) Liquids 2) Gases 3) Solids 4) Vapours

Answer:3

Solution:Most salts are crystalline solids at room temperature

4. Neutralisation of strong acid and strong base is called

1) Acidic salt 2) Basic salt 3) Normal salt 4) None

Answer:3

Solution:Neutralization between strong acid and strong base gives a neutral (normal) salt and water.

5. Salts of acetic acid are called

1) Acidic salt 2) Acetates 3) Both 1 and 2 4) Basic salt

Answer:2

Solution:Acetic acid (CH_3COOH) forms acetate salts (e.g., CH_3COONa).

6. The salt which contain ions replace from acid are

1) H^+ions 2) OH^-ions 3) H_2O 4) SO_4^{2-} ions

Answer:1

Solution:In salt formation, H^+ ions from acids are replaced by metallic or ammonium ions.

7. A salt which contain ions

1) Metallic ions 2) Ammonium ions 3) H^+ions 4) Both 1 and 2

Answer:4

Solution:Salts contain metallic ions (Na^+, K^+) or ammonium ions (NH_4^+) as cations.

8. $(NH_4)_2SO_4$ is a

1) Ammonion sulphate 2) Sodium sulphate

3) Ammonion chioride 4) Ammoniun phasphate

Answer:1

Solution:The correct IUPAC name is ammonium sulfate.

9. Acidic salts further reacts with bases give

1) Acidic salt 2) Basic salt 3) Normal salt 4) Acid

Answer:3

Solution:Acidic salts can complete neutralization when reacted with more base $\rightarrow$

forming normal salts.

10. Crystsllisation of two simple salts is

1) Acidic salt 2) Basic salt 3) Double salt 4) Acid

Answer:3

Solution:Double salts (e.g., potash alum) form when two simple salts crystallize together.

JEE MAINS LEVEL QUESTIONS

1. Potassium ferrocyanide is an example of

1) Complex salt 2) Normal salt 3) Double salt 4) Basic salt

Answer:1

Solution:Potassium ferrocyanide ($K_4[Fe(CN)_6]$) is a complex salt as it contains a complex ion $[Fe(CN)_6]^{4-}$.

2. $KCl.MnCl_2.6H_2O$ is a

1) Carnalite 2) Mohr's salt 3) Potash alum 4) Dolomite

Answer:A

Solution:The correct formula resembles Carnallite, which is a double salt (though the typical formula is $KCl \cdot MgCl_2 \cdot 6H_2O$, Mn can be substituted).

3. The salt which contain more than one anion or cation is called

1) Acidic salt 2) Basic salt 3) Double salt 4) Acids

Answer:3

Solution:Double salts (e.g., carnallite, potash alum) contain multiple cations/ anions that dissociate in water.

4. Double salts are

1) Solids 2) Crystalline 3) Both 1 and 2 4) Liquids

Answer:3

Solution:Double salts are crystalline solids (e.g., alum crystals).

5. Properties of the double salt

1) Same as its single costituent salts
2) Differ from those of its single costituent salts
3) Both 1 and 2 4) None

Answer:2

Solution:Double salts behave differently in solution than their individual salts.

6. In an aqueous solution, Double salt

1) Fully ionised 2) Solids 3) Will not ionise 4) Crystals

Answer:1

Solution:Double salts fully ionize in water, unlike complex salts.

7. Double salts are

1) Complex compounds 2) Simple conpound
3) Coordinate compounds 4) None

Answer:2

Solution:They are not complexes but simple ionic compounds that dissociate in water.

8. Which one is not an acidic salt?

1) NaH_2PO_2 2) NaH_2PO_3 3) NaH_2PO_4 4) None of these

Answer:1

Solution:NaH_2PO_2 (sodium hypophosphite) has no replaceable H^+ (not acidic).

Others:

NaH_2PO_3 (1 replaceable H^+)

NaH_2PO_4 (2 replaceable H^+)

9. The salts of phosphorous acid are called

1) Phosphates 2) Phosphites 3) Hypophosphites 4) Phosphides

Answer:2

Solution:Phosphorous acid (H_3PO_3) forms phosphite salts (e.g., Na_2HPO_3).

10. Which are acidic salts

1) NaH_2PO_2 , Na_2HPO_3 2) Na_2HPO_3 , Na_2HPO_4

3) $NaHCO_3$, NaH_2PO_4 4) All of these

Answer:3

Solution:3) $NaHCO_3$, NaH_2PO_4

$NaHCO_3$ (from H_2CO_3 + NaOH, retains 1 H^+).

NaH_2PO_4 (from H_3PO_4 + NaOH, retains 2 H^+).

Why not others:

NaH_2PO_2 lacks acidic H^+.

Na_2HPO_3 is a normal salt (no replaceable H^+).

JEE ADVANCED LEVEL QUESTIONS

Multi Correct Answer Type

11. Which of the following are salts ?

1) CH_3COONa 2) CH_3COOH 3) CH_3COOCa 4) KCl

Answer:1,3,4

Solution:CH_3COOH is acetic acid.

Statement Type:

A) Both Statements are true, Statement II is the correct explanation of Statement I.

B) Both Statements are true, Statement II is not correct explanation of Statement I.

C) Statement I is true, Statement II is false.

D) Statement I is false, Statement II is true.

12. Statement I : Calcium hydrogen carbonate is a acidic salt.

Statement II : The chemical formula of aluminium carbonate is $Al_2(CO)_3$.

Answer:C

Solution:Statement I is true because calcium hydrogen carbonate ($Ca(HCO_3)_2$) is

indeed an acidic salt as it contains replaceable hydrogen ions.
Statement II is false because the correct formula of aluminium carbonate is $Al_2(CO_3)_3$ (not $Al_2(CO)_3$ as written). The statement contains a typographical error in the formula.

13. Statement I : A salt formed by the partial replacement of H^+ ions of an acid from its molecule, with metal ions is called acid salt.
Statement II : The acid salt on dissolving in water furnishes hydrogen ion and turns red litmus to blue.

Answer:C

Solution:Statement I is true as it correctly defines an acid salt (e.g., $NaHSO_4$ formed from H_2SO_4).
Statement II is false because:
a) While acid salts do furnish H^+ ions in water,
b) The critical error is that they turn blue litmus to red (not red to blue), as they are acidic in nature.

Comprehension type :

The salt produced by the incomplete nutralisation of a base with an acid, is called basic salt.

14. Baking soda is a
1) Acidic salt 2) Basic salt 3) Normal salt 4) Double salt

Answer:2

Solution:Baking soda is sodium bicarbonate ($NaHCO_3$). It's formed when carbonic acid partially reacts with sodium hydroxide. The result contains a replaceable bicarbonate ion (HCO_3^-) that can act as a weak base in water. Hence, it's a basic salt.

15. Basic coppre nitrate is a
1) Acidic salt 2) Basic salt 3) Normal salt 4) Double salt

Answer:2

Solution:Basic copper nitrate contains both Cu^{2+} ions and OH^- ions along with nitrate ions. It forms when copper(II) hydroxide only partially reacts with nitric acid. Since OH^- remains in the salt, it exhibits basic properties.

Integer Type :

16. Potash alum contains ..... number of molecules.

Answer:1

Solution:Potash alum is a double salt with the chemical formula:$KAl(SO_4)_2 \cdot 12H_2O$.This formula represents one molecule of potash alum.

Matrix Matching Type :

17. Column-I Column-II
a) Washing soda 1) $FeSO_4\ 7H_2O$
b) Baking soda 2) $(NH_4)_2CO_3$
c) Smelling salt 3) $NaHCO_3$
d) Green vitriol 4) $Na_2CO_3 .1OH_2O$

A) a - 1, b - 2, c - 3, d - 4 B) a - 4, b - 3, c - 2, d - 1
B) a - 2, b - 1, c - 4, d - 3 D) a - 4, b - 2, c - 3, d - 1

Answer:B

Solution:

Column-I	Column-II
a) Washing soda	4) $Na_2 CO_3 .1OH_2O$
b) Baking soda	3) $NaHCO_3$
c) Smelling salt	2) $(NH_4)_2CO_3$
d) Green vitriol	1) $FeSO_4 7H_2O$

KEY

				TEACHING TASK					
1	2	3	4	5	6	7	8	9	10
3	2	3	4	1	2	1	1	3	1
11	12	13	14	15	16	17			
1,2,3	A	B	1	1	6	a-2,b-3,c-1,d-4			
				LEARNERS TASK					
			CONCEPTUAL UNDERSTANDING QUESTIONS						
1	2	3	4	5	6	7	8	9	10
3	2	3	3	2	1	4	1	3	3
			JEE MAINS&ADVANCED LEVEL QUESTIONS						
1	2	3	4	5	6	7	8	9	10
1	1	3	3	2	1	2	1	2	3
11	12	13	14	15	16	17			
1,3,4	C	C	2	2	1	B			