CHEMISTRY

BOOKS - MTG WBJEE CHEMISTRY (HINGLISH)

PRINCIPLES OF QUALITATIVE ANALYSIS

Wb Jee Workout Category 1 Single Option Correct Type

1. Which of the following salts is colourless?

A. $CdCl_2$

B. $CuSO_4 \cdot 5H_2O$

C. $MnSO_4 \cdot 7H_2O$

D. $NiSO_4 \cdot 7H_2O$

Answer: A

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2. Which of the following ions forms heavy salts?

A. Zn^{2+}

B. Mn^{2+}

C. Hg^{2+}

D. Na^+

Answer: C

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3. Salts of which of the following elements are mostly blue in colour?

A. Cu

B. Zn

C. Fe

D. Cr

Answer: A

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4. A metal oxide is yellow when hot and white when cold. The metal oxide is

A. ZnO

B. CuO

C. PbO

D. all of these

Answer: A

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5. Which of the following gas is coloured?

A. Cl_2

B. HCl

C. NH_3

D. SO_2

Answer: A

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6. The carbonate of which of the following cation is insoluble in water?

A. Na^+

B. K^+

C. NH_4^+

D. Ca^{2+}

Answer: D

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7. To a solution of an acid radical, $MgSO_4$ solution is added and white ppt. appear only on heating. The acid radical may be

A. CO_3^{2-}

B. SO_3^{2-}

C. HCO_3

D. $C_2O_4^{2-}$

Answer: C

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8. In a mixture having nitrite and nitrate , nitrate , nitrite can be destroyed by heating with H_2SO_4 and

A. Na_2CO_3

B. urea

C. oxalic acid

D. NaCl

Answer: B

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9. Production of a green edged flame on igniting the vapours evolved by heating a given inorganic salt with a few mL of ethanol and conc. H_2SO_4 indicates the presence of

A. tartrate

B. oxalate

C. acetate

D. borate.

Answer: D

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10. Chromyl chloride vapours are dissolved in water and acetic acid and lead acetate solution is added, then

A. the solution will remain colourless

B. the solution will become dark green

C. a yellow solution will be obtained

D. a yellow precipitate will be obtained.

Answer: D

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11. In a combination of NO_3, Br and I present in a mixture, Br and I interfere in the ring test for NO_3 . These are removed by adding a solution of

A. $AgNO_3$

B. Ag_2SO_4

C. Ag_2CO_3

D. none of these

Answer: B

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12. $BaCl_2$ lsolution gives a white ppt, with a solution of an acid radical which dissolves in dil. HCI with the evolution of a colourless, pungent smelling gas. The acid radical may be

A. SO_4^{2-}

B. S^{2-}

C. SO_3^{2-}

D. CO_3^{2-}

Answer: C

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13. When CS_2 layer containing both Br_2 and I_2 is shaken with excess of Cl_2 water, the violet colour due to I_2 disappears and orange colour due to Br_2 appears. The disappearance of violet colour is due to the formation of

A. I_3^-

B. HIO_3

C. ICl_2

D. I^-

Answer: B

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14. Which of the following radicals does not belong to group first?

A. Ag^+

B. Pb^{2+}

C. Hg_2^{2+}

D. Hg^{2+}

Answer: D

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15. Group reagent for group-1 basic radicals is

A. dil. HCl

B. conc. H_2SO_4

C. HNO_3

D. H_2S.

Answer: A

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16. Silver, mercury (ous) and lead are grouped together in a scheme of qualitative analysis because they form

A. soluble nitrates

B. carbonates which dissolve in dilute nitric acid

C. insoluble chlorides

D. all of these

Answer: C

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17. An inorganic salt solution on treatment with HCI gives a white ppt. Which of the following metal ions is possible?

A. Hg_2^{2+}

B. Hg^{++}

C. Zn^{++}

D. Cd^{++}

Answer: A

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18. A metal chloride solution on mixing with K_2CrO_4 solution gives a yellow ppt, which are insoluble in water. The metal may be

A. mercury

B. zinc

C. silver

D. lead

Answer: D

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19. In second group, H_2S is passed in the presence of dil. HCl because

A. HCl checks incomplete precipitation of higher group radicals

B. HCl checks precipitation of sulphur

C. both (a) and (b)

D. none of these

Answer: A

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20. Which of the following is insoluble in dil. HNO_3 but dissolves in aqua regia?

A. Hg S

B. Pb S

C. Bi_2S_3

D. CuS.

Answer: A

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21. In third group, iron gives blood red colouration with ammonium thiocyanate due to the formation of the compound?

A. Ferric cyanide

B. Ferric thiocyanate

C. Ferric thiocyanate ion

D. Ferric thiocyanide

Answer: B

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22. Potassium ferrocyanide is used in the detection of

A. Cu^{2+} ions

B. Fe^{3+} ions

C. both (a) and (b)

D. none of these

Answer: C

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23. A metal solution when treated with dimethyl glyoxime and NH_4OH gives a rose red complex. The metal is

A. Ni

B. V

C. Co

D. Mn

Answer: A

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24. Potassium cyanide is used for separating

A. Co^{2+} and Ni^{2+}

B. Cu^{2+} and Cu^{2+}

C. both (a) and (b)

D. none of these

Answer: C

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25. A white sodium salt dissolves readily in water to give a solution which is neutral to litmus. When silver nitrate solution is added to the solution, a white

precipitate is obtained which does not dissolve in dil. HNO_3. The anion could be

A. CO_3^{2-}

B. Cl^-

C. SO_4^{2-}

D. S^{2-}

Answer: B

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26. $K_3Co(NO_2)_6$ is known as

A. Fischer's salt

B. Thevard's blue

C. Rinmann's green

D. Blue vitriol.

Answer: A

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27. H_2S in the presence of HCl precipitate II group but not IV group because

A. HCl activates H_2S

B. HCl increases concentration of CI

C. HCI decreases concentration of S^2

D. HCI lowers the solubility of H_2S in solution.

Answer: C

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28. In fourth group, $Mn(OH)_2$ on heating with PbO_2 and conc. HNO_3 gives purple colour due to the formation of

A. $HMnO_4$

B. K_2MnO_4

C. PbO_2

D. $PbMnO_3$

Answer: A

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29. Sometimes yellow turbidity appears while passing H_2S gas even in the absence of group II radicals. This is because of

A. sulphur is present in the mixture as impurity

B. group IV radicals are precipitated as sulphides

C. the oxidation of H_2S gas by some acid radicals

D. group III radicals are precipitated as hydroxides

Answer: C

View Text Solution

30. Mg is not precipitated in V group because

A. $MgCO_3$ is soluble in water

B. $MgCO_3$ is soluble in NH_4Cl

C. $MgCO_3$ is soluble in NH_4OH

D. none of these.

Answer: B

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Wb Jee Workout Category 2 Single Option Correct Type

1. A white crystalline solid A on boiling with caustic soda solution gave a colourless gas B which when passed through an alkaline solution of potassium mercurio iodide gave a brown ppt. The substance A on heating gave a gas C which rekindled a glowing splinter but did not give brown fumes on air oxidation. The gas B is

A. H_2S

B. NH_3

C. HCl

D. CO_2

Answer: B

View Text Solution

2. When H_2S is passed through an ammoniacal salt solution X, a dirty white precipitate is obtained. The X can be a

A. cobalt salt

B. nickel salt

C. manganese salt

D. zinc salt

Answer: D

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3. An aqueous solution of a salt A gives a white crystalline precipitate B with NaCl solutions. The filtrate gave a black ppt. C when H_2S gas is passed in it. Compound B dissolves in hot water and the solution gives a yellow precipitate D on treatment with Nal and cooling. The compound A does not give

any gas with dilute HCI but liberates a reddish brown gas on heating. Identify the compounds A.

A. Pb S

B. $Pb(NO_3)_2$

C. $AgNO_3$

D. AgS

Answer: B

View Text Solution

4. A compound A on heating with caustic soda solution liberates a gas B which gives white fumes on

exposure to HCl gas. Heating is continued to expel the gas completely. The resultant alkaline solution again liberates the same gas B when heated with Zn powder. However, the compound A when heated alone does not evolve any gas. Identify A and B.

A. $\begin{matrix} A & B \\ AgNO_3 & NO_2 \end{matrix}$

B. $\begin{matrix} A & B \\ NH_4OH & NH_3 \end{matrix}$

C. $\begin{matrix} A & B \\ NH_4OH_3 & NH_3 \end{matrix}$

D. $\begin{matrix} A & B \\ BaSO_4 & H_2S \end{matrix}$

Answer: C

View Text Solution

5. A white, water insoluble solid A turns yellow on heating and becomes white on cooling. Solid A gives a clear solution B when treated with HCl solution and C when treated with NaOH solution. When H_2S is passed through B nothing is obtained. However if B is made neutral, H_2S caused the precipitation of white compound D. Identify C.

A. $NaAlO_2$

B. $NaBO_3$

C. ZnO

D. Na_2ZnO_2

Answer: D

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6. A hydrated metallic salt A, light green in colour, on careful heating gives a white anhydrous residue B. Aqueous solution of B reacts with NO to give a dark brown compound C. On strong heating, B decomposes to give a brown residue D and a mixture of two gases E and F. Identify E and F.

A. SO_2 and SO_3

B. NO_2 and NO

C. NH_3 and NO_2

D. None of these

Answer: A

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7. Sodium nitroprusside test is used to distinguish between

A. alcohols and phenols

B. aldehydes and ketones

C. formic acid and other carboxylic acids

D. 1°, 2° and 3° amines.

Answer: B

View Text Solution

8. A well known orange crystalline compound A when burnt imparts violet colour to flame. When heated with compound B in presence of concentrated sulphuric acid then it evolves a red coloured gas C which when passed through alkaline solution of lead acetate gives yellow precipitate of compound D. Identify D.

A. CrO_2Cl_2

B. $K_2Cr_2O_7$

C. As_2S_3

D. $PbCrO_4$

Answer: D

View Text Solution

9. In the brown ring complex $[Fe(H_2O)(NO)]SO_4$, nitric oxide behaves as

A. NO^+

B. neutral NO molecule

C. NO^-

D. none of these

Answer: A

View Text Solution

10. Which of the following reagents is used to distinguish between benzoic acid from phenol ?

A. Molish reagent

B. Tollen's reagent

C. 5% NaOH

D. Neutral $FeCl_3$

Answer: D

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11. For which of the following compounds Lassaigne's test of nitrogen will fail ?

A. $H_2NCONHNH_2 \cdot HCl$

B. $H_2NNH_2 \cdot 2HCl$

C. H_2NCONH_2

D. $C_6H_5 - N = N - C_6H_5$

Answer: B

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12. Match the column I with column II and mark , the appropriate choice .

Column I		Column II	
(A)	Beilstein test	(i)	Sulphur
(B)	Sodium nitroprusside	(ii)	Carbon
(C)	Liebig's method	(iii)	Nitrogen
(D)	Kjeldahl's method	(iv)	Chlorine

A.

$(A) \rightarrow (i), (B) \rightarrow (ii), (C) \rightarrow (iii), (D) \rightarrow (iv)$

B.

$(A) \rightarrow (iii), (B) \rightarrow (ii), (C) \rightarrow (i), (D) \rightarrow (iv)$

C.

$(A) \rightarrow (iv), (B) \rightarrow (i), (C) \rightarrow (ii), (D) \rightarrow (iii)$

D.

$(A) \rightarrow (ii), (B) \rightarrow (iii), (C) \rightarrow (iv), (D) \rightarrow (i)$

Answer: C

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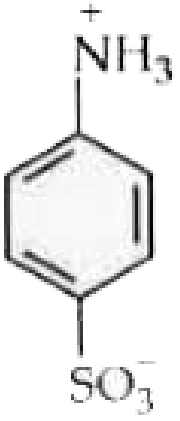
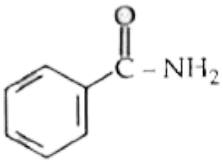
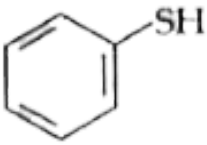
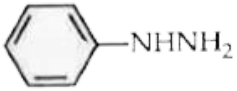
13. Sodium extract of Lassaigne's solution is treated with $FeSO_4$, $FeCl_3$ and dil. H_2SO_4 to get a blood red colour . Which of the following is probable organic compound ?

A.



B. 

C. 

D. 

Answer: A

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14. The function of boiling the sodium extract with conc. HNO_3 before testing for halogens is

A. to make solution clear

B. to destroy CN^- and S^{2-} ions which will otherwise give precipitate

C. to make the solution acidic

D. to convert Fe^{2+} to Fe^{3+}

Answer: B

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15. An inorganic compound A when heated decomposes completely to give only two gases B and C . B is neutral gas , fairly soluble in water and itself decomposes on heating to two different gases D and

E .

A when warmed with NaOH gives another gas F which when passed through $CuSO_4$ solution gives a deep blue colour. Identify A .

A. NH_4NO_3

B. $AgNO_3$

C. $Cu(NO_3)_2$

D. $Pb(NO_3)_2$

Answer:

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Wb Jee Workout Category 3 One Or More Than One Option Correct Type

1. The reagents, NH_4Cl and aqueous NH_3 will precipitate

A. Ca^{2+}

B. Al^{3+}

C. Bi^{3+}

D. Mg^{2+}

Answer: B::C

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2. In organic compounds , halogens are estimated by

A. Liebig method

B. Duma's method

C. Carius method

D. Schiff's and Pina method

Answer: C::D

View Text Solution

3. For which of the following compounds, Lassaigne's test of nitrogen fails?

A. Nitrobenzene

B. Hydroxylamine

C. Dimethylamine

D. Hydrazine

Answer: B::D

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4. A clear solution is heated in a china dish where upon a solid separates from the hot solution. It is due to the fact that

A. the solid has a positive enthalpy of solution

B. the solid has a negative enthalpy of solution

C. solvent has evaporated

D. the solute is volatile.

Answer: A::C

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5. A solution of colourless salt H on boiling with excess NaOH produces a non-flammable gas. The gas evolution ceases after sometime. Upon addition of Zn dust to the same solution, the gas evolution restarts. The colourless salt(s) H is (are)

A. NH_4NO_3

B. NH_4NO_2

C. NH_4Cl

D. $(NH_4)_2SO_4$

Answer: A::B

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6. Which of the following statements(s) is (are) correct with reference to the ferrous and ferric ions?

A. Fe^{3+} gives brown colour with potassium ferricyanide.

B. Fe^{2+} gives blue precipitate with potassium ferricyanide.

C. Fe^{3+} gives red colour with potassium thiocyanate.

D. Fe^{2+} gives brown colour with ammonium thiocyanate.

Answer: B::C

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7. Which of the following statements(s) is (are) correct when a mixture of NaCl and $K_2Cr_2O_7$, is gently warmed with concentrated H_2SO_4?

A. A deep red vapour is evolved.

B. The vapours when passed into NaOH solution gives a yellow solution of Na_2CrO_4

C. Chlorine gas is evolved.

D. Chromyl chloride is formed.

Answer: A::B::D

View Text Solution

8. During the test of halogens by silver nitrate test, the sodium extract is first boiled with a few drops of conc. HNO_3 to

A. decompose sodium halides present

B. decompose sodium cyanide if present

C. decompose sodium sulphide if present

D. acidify the sodium extract.

Answer: B::C::D

View Text Solution

9. Propan-1-ol and propan-2-ol can be best distinguished by

A. oxidation with alkaline $KMnO_4$ followed by reaction with Fehling's solution

B. oxidation with acidic dichromate followed by reaction with Fehling's solution

C. oxidation by heating copper with acidic dichromate solution followed by reaction with Fehling's solution

D. oxidation with concentrated H_2SO_4 followed by reaction with Fehling's solution.

Answer: C

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10. When a pinch of sodium bicarbonate is added to carboxylic acid brisk effervescence is produced . This effervescence is produced due to evolution of

A. H_2 gas

B. H_2O vapours

C. CO_2 gas

D. large amount of heat.

Answer: C

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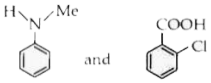
Wb Jee Previous Years Questions Category 1 Single Option Correct Type

1. Correct pair of compounds which gives blue colouration/precipitate and white precipitate , respectively , when their Lassaigne's test is separately done is

A. $NH_2NH_2.HCl$ and $ClCH_2COOH$

B. NH_2CSNH_2 and $PhCH_2Cl$

C. NH_2CH_2COOH and NH_2CONH_2

D. 

Answer: D

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2. The reaction of nitroprusside anion with sulphide ion gives purple colouration due to the formation of

A. the tetranionic complex of iron (II) coordinating to one NOS^- ion

B. the dianionic complex of iron (II) coordinating to one NCS^- ion

C. the trianionic complex of iron (III) coordinating to one NOS^- ion

D. the tetranionic complex of iron (III) coordinating to one NCS^- ion

Answer: A

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3. Among the following observations, the correct one that differentiates between SO_3^{2-} and SO_4^{2-} is

A. both form precipitate with $BaCl_2$, SO_3^{2-} dissolves in HCl but SO_4^{2-} does not

B. SO_3^{2-} forms precipitate with $BaCl_2$, SO_4^{2-} does not

C. SO_4^{2-} forms precipitate with $BaCl_2$, SO_3^{2-} does not

D. both form precipitate with $BaCl_2$, SO_4^{2-} dissolves in HCl but SO_3^{2-} does not

Answer: A

View Text Solution

4. In the Lassaigne's test for the detection of nitrogen in an organic compound, the appearance of blue coloured compound is due to

A. ferric ferricyanide

B. ferrous ferricyanide

C. ferric ferrocyanide

D. ferrous ferrocyanide.

Answer: C

View Text Solution

5. Match the flame colours of the alkaline earth metal salts in the Bunsen burner.

(p)	Calcium	1. Brick red
(q)	Strontium	2. Apple green
(r)	Barium	3. Crimson

A. p-1 , q - 3 , r- 2

B. p - 3 , q - 1 , r - 2

C. p - 2 , q - 3 , r - 1

D. p-1 , q - 2 , r - 3

Answer: A

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6. When $BaCl_2$ is added to an aqueous salt solution, a white precipitate is obtained. The anion among CO_3^{2-}, SO_3^{2-} and SO_4^{2-} that was present in the solution can be

A. CO_3^{2-} but not any of the other two

B. SO_3^{2-} but not any of the other two

C. SO_4^{2-} but not any of the other two

D. any of them.

Answer: D

View Text Solution

Wb Jee Previous Years Questions Category 2 Single Option Correct Type

1. Compound X is tested and the results are shown in the table :

	Test	Result
1.	Aqueous sodium hydroxide is added, then heated gently.	Gas given off which turns damp red litmus paper blue.
2.	Dilute hydrochloric acid is added.	Effervescence, gas given off which turns lime water milky and acidified $K_2Cr_2O_7$ paper green.

Which ions are present in compound X?

A. Ammonium ions and sulphite ions

B. Ammonium ions and carbonate ions

C. Sodium ions and carbonate ions

D. Ammonium ions and sulphate ions.

Answer: A

View Text Solution

2. Which of the following solutions will turn violet when a drop of lime juice is added to it?

A. A solution of Nal

B. A solution mixture of KI and $NaIO_3$

C. A solution mixture of Nal and KI

D. A solution mixture of KIO_3 and $NalO_3$.

Answer: B

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