CHEMISTRY

JEE (MAIN AND ADVANCED) CHEMISTRY

PRACTICAL CHEMISTRY

Level I Exercise

1. An azo dye aniline yellow will be formed when benzene diazonium chloride reacts with

A. Phenol

B. Aniline

C. β- Naphthol

D. Nitrobenzene

Answer: B

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2. Azodye test is used for the identification of

A. aliphatic - 1^0 - amine

B. Aromatic - 1^0 -amine

C. Aromatic - 2^0 -amine

D. aliphatic - 2^0 - amine

Answer: B

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3. Red coloured compound formed by ethyl alcohol with cerric ammonium nitrate is

A. $(C_2H_5)_2Ce(NO_3)_6$

B. $(C_2H_5)_2Ce(NO_3)_2$

C. $(C_2H_5OH)_2Ce(NO_3)_4$

D. $(C_2H_5OH)_2Ce(NO_3)_6$

Answer: C

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4. An organic compound taken in a test tube and acetyl chloride is added to it. White fumes appeared when a glass rod dipped NH_3 is placed at the mouth of test tube. This indicates that organic compound may contain.

A. -Cl

B. -COOH

C. -OH

D. double bond

Answer: C

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5. Libermann's test used for identification of which functional group in organic compounds

A. alcohol

B. 1^0 - amine

C. Phenolic

D. aldehyde

Answer: C

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6. Which reagent is used to remove SO_4^{2-} and Cl^-

A. NaOH

B. $Pb(NO_3)_2$

C. $BaSO_4$

D. KOH

Answer: B

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7. $Fe(OH)_3$ can be separated from $Al(OH)_3$ by addition of:

A. Dil. HCI

B. NaCl solution

C. NaOH solution

D. NH_4CI and NH_4OH

Answer: C

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8. On the addition of few drops of a solution containing CrO_4^{2-} ions to the solution of Ba^{2+}, Sr^{2+} and Ca^{2+} ions, the precipitate obtained first will be of:

A. $CaCrO_4$

B. $SrCrO_4$

C. $BaCrO_4$

D. A mixture of all the three

Answer: C

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9. Sometimes yellow turbidity appears while passing H_2S gas even in the absence of second group radicals. This is because:

A. Sulphur is present in the mixture as an impurity

B. The fourth group radicals get precipitated as sulphides

C. Of the oxidation of H_2S to sulphur by some radicals acting as oxidant

D. The third group radicals get precipitated as hydroxides.

Answer: C

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10. Which pair of ions cannot be seperated by H_2S in dil/HCl

A. Bi^{3+}, Sn^{4+}

B. Al^{3+}, Hg^{2+}

C. Zn^{2+}, Cu^{2+}

D. Ni^{2+}, Cu^{2+}

Answer: A

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11. A light green coloured salt soluble in water gives black precipitate on passing H_2S which dissolves readily in HCl. The metal ion present is :

A. Co^{2+}

B. Fe^{2+}

C. Ni^{2+}

D. Mn^{2+}

Answer: B

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12. Two test tubes containing a nitrate and a bromide are treated separately with conc, H_2SO_4 brown fumes evolved are passed in water. The water will be coloured by vapours evolved from the test tube containing

A. Nitrate

B. Bromide

C. Both (1) and (2)

D. None of these

Answer: B

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13. A white salt is insoluble in cold water but soluble in boiling water. Its solution when treated with potassium chromate solution gives yellow precipitate. The salt may be :

A. $BaCl_2$

B. $SrCl_2$

C. $PbCl_2$

D. $Hg(NO_3)_2$

Answer: C

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14. A white powder when strongly heated gives off brown fumes. A solution of this powder gives as yellow precipitate with a solutin of KI. When a solution of barium chloride is added to a solution of powder, a white precipitate results. This white powder may be

A. A soluble sulphate

B. $Ba(NO_3)_2$

C. KBr and NaBr

D. $AgNO_3$

Answer: D

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15. A solution of white crystals gives a precipitate with $AgNO_3$ but no precipitate with a solution of Na_2CO_3. The action of conc. H_2SO_4 on the crystals yields a brown gas. The crystals are of :

A. $NaNO_3$

B. KCl

C. $Ca(NO_3)_2$

D. NaBr

Answer: D

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16. The solution of a chemical compound reacts with $AgNO_3$ solution to from a white precipitate of Y which dissolves in NH_4OH to give a complex Z. When Z is treated with dilute HNO_3, Y reappears. The chemical compound X can be:

A. NaCl

B. CH_3Cl

C. NaBr

D. NaI

Answer: A

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17. Chromyl ion is :

A. CrO_2^+

B. CrO_2^{2+}

C. CrO^{2+}

D. CrO_2^{3+}

Answer: B

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18. An inorganic salt is heated with ethyl alcohol and conc, H_2SO_4, vapours evolved produces greenedged flame on ignition, it indicates the presence of:

A. F^-

B. $C_2O_4^{2-}$

C. BO_3^{3-}

D. CIO_3^-

Answer: C

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19. A solution of the given mixture was prepared in conc. HCI. On diluting this solution with water, a turbidity appears. This indicates the presence of

A. As^{3+}

B. Hg^{2+}

C. Sb^{3+}

D. Cu^{2+}

Answer: C

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20. Which of the follwoing statements is correct with reference to the ferrous and ferric ions:

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

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

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

D. None of these

Answer: B

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21. H_2S gas when passed through a solution of cations containing HCl precipitates the cations of second group of qualitative analysis but not those belonging to the fourth group because :

A. Sulphides of group IV cations are unstable in HCI

B. Presence of HCI decreases sulphide ion concentration

C. Solubility product of group II sulphides is more than that of group IV sulphides.

D. Presence of HCI increases sulphide ion concentration.

Answer: B

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22. Which is soluble in water :

A. AgF

B. CaF_2

C. AgCl

D. AgBr

Answer: A

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23. Nessler's reagent is used to detect the presence of:

A. CrO_4^{2-}

B. PO_4^{3-}

C. MnO_4^-

D. NH_4^+

Answer: D

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24. Which sulphides are soluble in only aquaregia:

A. NiS

B. CoS

C. HgS

D. All of these

Answer: D

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25. Which compound will not give positive chronyl chloride test:

A. Copper chloride $CuCl_2$

B. Mercuric chloride, $HgCl_2$

C. Zinc chloride, $ZnCl_2$

D. Anilinium chloride, $C_6H_5NH_3^+Cl^-$

Answer: B

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26. A metal salt solution forms a yellow/precipitate with K_2CrO_4 in acetic a while precipitate with dil H_2SO_4 but gives no preciptate with NaCI or Nal. The white precipitate obtained when Na_2CO_3

A. Lead carbonate

B. Basic lead carbonate

C. Barium carbonate

D. Strontium carbonate

Answer: C

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27. A pale green crystalline inorganic salt (A) dissolves freely in water. It gives a brown precipitate on addition of aqueous NaOH. The solution of (A) also gives a black precipitate on bubbling H_2S in alkaline medium. An aqueous solution of (A) decolourises the pink colour of the permanganate solution. The metal in the salt solution is :

A. Copper

B. Aluminium

C. Lead

D. Iron

Answer: D

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28. An aqueous solution contains Hg^{2+}, Hg_2^{2+}, Pb^{2+} and Cd^{2+}. The addition of HCI (6N) will precipitate:

A. Hg_2Cl_2 only

B. $PbCl_2$ and Hg_2Cl_2

C. $PbCl_2$ only

D. $PbCl_2$ and $HgCl_2$

Answer: B

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29. A reddish-pink substance on heating gives off a vapour which condences on the sides of the test tube and the substance turns blue. Il on cooling water is added to the residue it turns to its original colour. The substance is :

A. Iodine sulphate crystals

B. Copper sulphate crystals

C. Cobalt chloride crystals

D. Zinc oxide

Answer: C

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30. H_2S gas is passed into aqueous solution of $Zn(CH_3COO)_2$ and $ZnCl_2$ in test tubes I and II separately. Then ZnS is precipitated:

A. In I

B. In II

C. In both

D. In none of these

Answer: A

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31. An aqueous solution containing a mixture of copper (II), iron (II) and lead (III) ions was treated with an excess of aqueous ammonia. What

precipitate was left by this reaction,

A. Copper (II) hydroxide only

B. Iron (II) hydroxide only

C. Lead (II) hydroxide only

D. Lead (II) hydroxide and iron (II) hydroxide

Answer: D

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32. Tests on an aqueous solution of a sodium salt having an anion X^{n-} gave the following results: anion $X^{n-} \xrightarrow{K_2Cr_2O_7 / H^+} \text{green solution} + \text{gas} \xrightarrow{Pb(NO_3)_2} \text{black precipitate.}$

Which one of the following could be X^{n-}:

A. I^-

B. NO_2^-

C. S^{2-}

D. SO_4^{2-}

Answer: C

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33. The reagent NH_4CI and aqueous NH_3 precipitates:

A. Ca^{2+}

B. Al^{3+}

C. Mg^{2+}

D. Zn^{2+}

Answer: B

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34. Which gives blue bead in borax bead test:

A. Cr^{2+}

B. Co^{2+}

C. Ni^{2+}

D. Cd^{2+}

Answer: B

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35. The ion not precipitated by H_2S in presence of HCl is :

A. Cu^{+}

B. Ag^{+}

C. Pb^{2+}

D. Al^{3+}

Answer: D

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36. How do we differentiate between Fe^{3+} and Cr^{3+} in group III ?

A. By taking excess of NH_4OH

B. By increasing NH_4^+ ion concentration

C. By decreasing OH^- ion concentration

D. Both (b) and (C)

Answer: D

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37. Which statement is correct :

A. Fe^{3+} ions give deep green precipitate with $K_4Fe(CN)_6$ solution

B. On heating K^+, Ca^{2+} and HCO_3^- ions we get a precipitate of $K_2Ca(CO_3)_2$

C. Manganese salts give a violet borax bead test in the reducing flame

D. From a mixed precipitate of AgCl and AgI ammonia solution dissolves only AgCI

Answer: D

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38. An aqueous solution of a substance gives a white precipitate on treatment with dilute hydrochloric acid, which dissolves on heating. When hydrogen sulphide is passed through the hot acidic solution, a black precipitate is obtained. The substance is a :

A. Hg_2^{2+} salt

B. Cu^{2+}

C. Ag^+ salt

D. Pb^{2+} salt

Answer: D

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39. Identify the correct order of solubility of Na_2S, CuS and ZnS in aqueous medium :

A. $CuS > ZnS > Na_2S$

B. $ZuS > Na_2S > CuS$

C. $Na_2S > CuS > ZnS$

D. $Na_2S > ZnS > CuS$

Answer: D

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40. A gas 'X' is passed through water to form a saturated solution. The aqueous solution on treatment with silver nitrate gives a white precipitate. The saturated aqueous solution also dissolves magnesium ribbon with evolution of a colourless gas 'Y'. Identify 'X' and 'Y':

A. $X = CO_2, Y = CI_2$

B. $X = Cl,_2 , Y = CO_2$

C. $X = Cl_2, Y = H_2$

D. $X = H_2, Y = CI_2$

Answer: C

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41. $[X] + H_2SO_4 \rightarrow [Y]$ a colourless gas with irritating smell, $[Y] + K_2Cr_2O_7 + H_2SO_4 \rightarrow \text{Green solution}$, [X] and [Y] is :

A. SO_3^{2-}, SO_2

B. Cl^-, HCl

C. S^{2-}, H_2S

D. CO_3^{2-}, CO_2

Answer: A::C

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42. A solution which is 10^{-3} M each in Mn^{2+}, Fe^{2+}, Zn^{2+} and Hg^{2+} is treated with 10^{-16} M sulphide ion. If K_{sp} of MnS, FeS, ZnS and HgS are, 10^{-13}, 10^{-18}, 10^{-24} and 10^{-53} respectively, which one will precipitate first :

A. FeS

B. MgS

C. HgS

D. ZnS

Answer: C

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43. A sodium salt on treatment with $MgCI_2$ gives white precipitate only on heating. The anion of sodium salt is

A. HCO_3^-

B. CO_3^{2-}

C. NO_3^-

D. SO_4^{2-}

Answer: A

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44. A metal nitrate reacts with KI to give a black precipitate which addition of excess of KI converts into orange colour solution. The cation

of metal nitrate is:

A. Hg^{2+}

B. Bi^{3+}

C. Pb^{2+}

D. Cu^{+}

Answer: B

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45. Which pair of compounds is expected to show similar colour in aqueous medium :

A. $FeCl_2$ and $CuCl_2$

B. $VOCI_2$ and $CuCl_2$

C. $VOCI_2$ and $FeCl_2$

D. $FeCl_2$ and VCI_4

Answer: A

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46. Salt with which one of the following anion produce deep blue colour with starch and Kl is

A. chloride

B. nitrite

C. acetate

D. bromide

Answer: B

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47. $AgNO_3$ gives yellow ppt with

A. KIO_3

B. KI

C. CHI_3

D. CH_2I_2

Answer: B

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48. AgCl with NH_3 forms

A. $\left[Ag(NH_3)_2\right]Cl$

B. $AgNO_3$

C. $AgNH_2CI$

D. Ag mirror

Answer: A

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49. $CuSO_4 + NH_4OH$ gives deep blue complex of

A. $\left[Cu(NH_3)_4\right]SO_4$

B. $\left[Cu(NH_3)_2\right]SO_4$

C. $\left[Cu(NH_3)_6\right]SO_4$

D. $\left[Cu_2(NH_3)_4\right]SO_4$

Answer: A

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50. Al^{+3}. Fe^{+3} & Cr^{+3} are grouped together for qualitative analysis because their

A. carbonates are insoluble in NH_3

B. hydroxides are insoluble in NH_3

C. sulphides are soluble in acid

D. sulphides are insoluble in acid

Answer: B

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51. The brown colour of ring in NO_3^- test is of

A. $FeSO_4$

B. $\left[Fe(H_2O)_5(NO)\right]SO_4$

C. $FeSO_4.NO_2$

D. none

Answer: B

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52. $CoCl_2$ is

A. pink

B. black

C. green

D. colourless

Answer: A

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53. Which can be used in place of NH_4CI in III group precipitation

A. NH_4NO_3

B. $(NH_4)_2VrO_4$

C. $(NH_4)_2SO_4$

D. NaCl

Answer: A

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54. Na_2CO_3 cannot be used in place of $(NH_4)_2CO_3$ for the precipitation of V group, because

A. Na^+ interferes in the detection of V group

B. conc. of CO_3^{2-} is very low

C. Na will react with acid radicals

D. Mg will be precipitated.

Answer: D

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55. A black sulphide is formed by the action of H_2S on

A. $CuCl_2$

B. $CdCl_2$

C. $ZnCl_2$

D. $NaCl_2$

Answer: A

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56. Which combines with Fe^{+2} to form brown complex

A. N_2O

B. NO

C. N_2O_3

D. N_2O_5

Answer: B

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57. Chemical valcano is produced on heating

A. $K_2Cr_2O_7$

B. $(NH_4)_2Cr_2O_7$

C. $ZnCr_2O_7$

D. K_2CrO_4

Answer: B

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58. Acidified $K_2Cr_2O_7$ turns green by

A. CO_2

B. CO

C. SO_2

D. HCl

Answer: C

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59. Which gives blood red colour with ammonium thiocyanate

A. Fe^{+3}

B. Fe^{+2}

C. Cu^{+2}

D. Cd^{+2}

Answer: A

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60. Nitrate of all metals are

A. unstable

B. coloured

C. insoluble in water

D. soluble in water

Answer: D

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61. In III group precipitation NH_4CI is added before adding NH_4OH due to

A. decrease conc. of OH^-

B. prevent interference of PO_4^{-3}

C. increase conc. of CI^-

D. increase conc. of OH^- ions.

Answer: A

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62. The cations present in a slightly acidic solution are Fe^{3+}, Zn^{2+} and Cu^{2+}. The reagent that when added in excess to this solution would be identified and separated Fe^{3+} in one step is

A. 2 M HCl

B. 6 M NH_3

C. 6 M NaOH

D. H_2S gas

Answer: B

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63. Concentrated aqueous sodium hydroxide can separate a mixture of

A. Al^{3+} and Sn^{2+}

B. Al^{3+} and Fe^{3+}

C. Al^{3+} and Zn^{2+}

D. Zn^{2+} and Pb^{2+}

Answer: B

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64. Preparation of Na_2CO_3 extract is made for acid radical analysis because

A. all anion react with Na to give water soluble compounds

B. Na is more reactive

C. Na_2CO_3 is water soluble

D. all sodium compounds are ionic

Answer: A

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65. $Pb(CH_3COO)_2$ gives ..... colour with H_2S

A. Black

B. white

C. red

D. orange

Answer: A

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66. On heating $NaCl + K_2Cr_2O_7 + H_2SO_4$ conc., the gas comes out

A. CrO_2Cl_2

B. $CrOCl_2$

C. Cl_2

D. O_2

Answer: A

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67. On passing CrO_2Cl_2 in water & then adding $(CH_3COO)_2$ Pb, the ppt formed is

A. $PbCrO_4$

B. $PbCl_2$

C. $CrCl_3$

D. Pb_2CrO_4

Answer: A

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68. NaCl, NaBr, Nal mixture on adding conc. H_2SO_4 gives gases respectively

A. HCl, Br_2, I_2

B. HCl, HBr, HI

C. Cl_2, Br_2, I_2

D. HCl, HBr, I_2

Answer: A

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69. Redish brown (choclate) ppt are formed with

A. Cu^{+2} and $\left[Fe(CN)_6\right]^{-2}$

B. Ba^{+2} and SO_4^{-2}

C. Pb^{+2} and I^-

D. Ag^+ and I^-

Answer: A

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70. Which of the following sulphate is inslouble in water

A. $CuSO_4$

B. $CdSO_4$

C. $PbSO_4$

D. $Bi_2(SO_4)_3$

Answer: C

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71. Disodium hydrogen phosphate is used to test

A. Mg^{+2}

B. Na^{+}

C. Ca^{+2}

D. Zn^{2+}

Answer: A

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72. Assertion : A very dilute acidic solution of Cd^{2+} and Ni^{2+} gives yellow ppt. of CdS on passing H_2S.

Statement: Solubility product of CdS is more than that of NiS.

A. Both assertion and statement are true and statement is an explanation of assertion

B. Assertion is correct and statement is wrong, statement is not an explanation of assertion

C. Assertion is wrong and statement is correct, statement is not an explanation of assertion

D. Both assertion and statement are wrong and statement is not an explanation of assertion

Answer: B

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73. In nitroprusside ion, the iron and NO exist as Fe^{II} and NO^{+} rather than Fe^{III} and NO. These forms can be differentiated by

A. estimating the concentration of iron

B. measuring the concentration of CN^{-}

C. measuring the solid state magnetic moment

D. thermally decomposing the compound

Answer: C

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74. (A) : Sulphate is estimated as $BaSO_4$ and not as $MgSO_4$

(R) : Ionic radius of Mg^{2+} is smaller than that of Ba^{2+}.

A. Both A and R are correct, and R is the correct explanation of the A

B. Both A and R are correct, and R is not the correct explanation of the A

C. A is correct but R is incorrect

D. A is incorrect but R is correct

Answer: B

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Level Ii Lecture Sheet Exercise I Single Or More Than One Option Correct

1. In Lassaigne's test, the organic compound is first fused with sodium metal The sodium metal is used because

A. The melting point of sodium metal is low

B. Sodium metal reacts with elements present in organic compounds to form inorganic compounds.

C. All sodium salts are soluble in water

D. All sodium salts are not soluble in water

Answer: A::B::C

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2. In Lassaigne's test the organic compound is fused with Na followed by extraction with distilled water. Which of the following is not possible fusion product?

A. NaNC

B. NaCN

C. Na_2S

D. NaCNS

Answer: B::C::D

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3. Lassaigne's test for the detection of nitrogen fails in

A. NH_4NO_3

B. NH_4Cl

C. NH_2CONH_2

D. NH_2NH_2

Answer: A::B::D

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4. When excess of $FeSO_4$ is added to sodium extract the compound formed is/are

A. $Na_2[Fe(CN)_6]$

B. $Fe(OH)_2$

C. Na_2SO_4

D. $Na_2[Fe(SCN)]$

Answer: A::B::C

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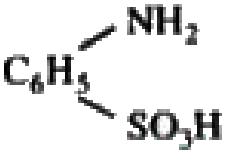
5. Which of the following will give blood red colour with $FeCl_3$ in sodium extract ?

A. 

B. $H_2N - \overset{\overset{S}{||}}{C} - NH_2$

C. $CH_3 - \overset{\overset{O}{||}}{C} - NH_2$

D. $H_2N - \overset{\overset{O}{||}}{C} - NH_2$

Answer: A::B

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6. Which of the following organic compounds will give white precipitate with $AgNO_3$?

A. $C_6H_5NH_3^+Cl^-$

B. NaCl

C. 2,4,6-Trinitrochlorobenzene

D. Benzyl chloride

Answer: A::B::C::D

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7. Which of the following give positive test with bromine water and Baeyer's reagent?

A. Ethane

B. Ethylene

C. Vinylalcohol

D. Acetylene

Answer: B::C::D

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8. Which of the following compound(s) decolourises Bromine water and also gives positive test with neutral $FeCl_3$ solution?

A. $CH_2 = CH - OH$

B. $CH_2 = CH - CH_2OH$

C. $CH_3 - CH = CH - OH$

D. 

Answer: A::C::D

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9. Which of the following respond to litmus test?

A. 1. Resorcinol

B. 2. Benzoic Acid

C. 3. Aniline

D. 4. Benzamide

Answer: A::B

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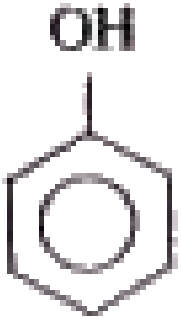
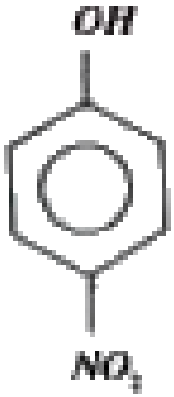
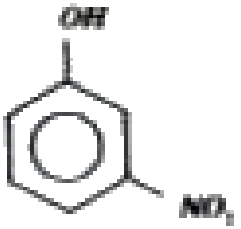
10. Which of the following will not give positive Libermann's test?

A. 

B. 

C. 

D. 

Answer: B::C::D

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11. Which of the following will evolve CO_2 on reaction with $NaHCO_3$?

A. Salicylic acid

B. Picric acid

C. Benzoic acid

D. 4-Nitrobenzoic acid

Answer: A::B::C::D

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12. Aldehydes and ketones canbe distinguished by using.

A. Tollen's reagent

B. Fehling's reagent

C. Benedict's solution

D. Hinsberg reagent

Answer: A::B::C

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13. Which of the following will show positive azodye test ?

A. $C_6H_5NH_2$

B. $C_2H_5NH_2$

C. $C_6H_5CH_2NH_2$

D. $C_6H_4(CH_3)NH_2$

Answer: A::D

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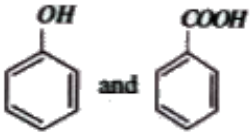
14. Which of these can be distinguished by adding HCl or Na_2CO_3 ?

A. $R-NH_2$ R - Cl

B. 

C. CH_3CH_2OH and $CH_3\underset{\underset{OH}{|}}{C}HCH_3$

D. $CH_3-\underset{\underset{O}{||}}{C}-CH_3$ amd CH_3CH_2CHO

Answer: A::B

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15. Which of the following reagents can be used to separate a mixture of aniline and phenol?

A. H_2O

B. NaOH

C. $NaHCO_3$

D. HCl

Answer: B::D

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16. Ethanol and ethanal are distinguished by

A. Fehling's solution

B. Tollens reagent

C. Iodoform test

D. Cericammonium nitrate

Answer: A::B::D

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17. Formic acid and acetic acid can be distinguished by

A. Tollen's reagent

B. Fehling's solution

C. $KMnO_4$

D. $NaHCO_3$

Answer: A::B::C

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18. Methanoic acid and inethanal can be distinguished by

A. Tollens reagent

B. Sodium bicarbonate

C. 2, 4 D.N.P test

D. Benedicts test

Answer: B::C::D

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19. Which of the following will give brick red ppt. with Fehling's solution?

A. HCHO

B. HCOOH

C. glucose

D. fructose

Answer: A::B::C::D

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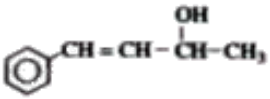
20. Compound 'A' $(C_{10}H_{12}O)$ evolves H_2 gas with Na metal. It reacts with Br_2/CCI_4 to give $B(C_{10}H_{12}Br_2O)$ with $I_2/NaOH$ it forms iodoform and acid $C[C_9H_8O_2]$. A has geometrical and optical isomers. The structure of A and C should be.

A. 

B. Ph. CH=CHCOOH

C. 

D. 

Answer: B::C::D

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21. The gas(es) which turn lime water milky is (are)

A. CO_2

B. SO_2

C. NO_2

D. NO

Answer: A::B

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22. Which of the following sulphide(s) is (are) not decomposed with dil. H_2SO_4?

A. 1. PbS

B. 2. CaS

C. 3. NiS

D. 4. CoS

Answer: A::B::C

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23. Which of the following do not give chromyl chloride test?

A. $PbCl_2$

B. NaCl

C. NaBr

D. KI

Answer: A::C::D

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24. Which of the following radicals will be precipitated by passing H_2S through a conc. HCI solution?

A. Cu

B. Sb

C. Cd

D. As

Answer: A::B::D

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25. KCN is used for separating

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

B. Mn^{+2} and Zn^{+2}

C. Ba^{+2} and Ca^{+2}

D. Cu^{+2} and Cd^{+2}

Answer: A::D

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26. Which of the following cations do (does) not give borax bead test?

A. Mg^{+2}

B. Mn^{+2}

C. Cu^{+2}

D. Pb^{2+}

Answer: A::D

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27. The substance(s) which undergo sublimation is/are

A. $AICI_3$

B. $HgCl_2$

C. NaCl

D. $CaCl_2$

Answer: A::B

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28. The evolution of red-brown gas on heating a salt with $K_2Cr_2O_7$ and conc. H_2SO_4 can arise from

A. chloride

B. bromide

C. nitrate

D. nitrite

Answer: A::B

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29. On reaction with dil. H_2SO_4 which of the following salts will give out a gas that turns an acidified dichromate paper green?

A. Na_2CO_3

B. Na_2S

C. $ZnSO_3$

D. FeS

Answer: B::C::D

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30. A white precipitate is obtained when

A. a solution of $BaCl_2$ in treated with Na_2SO_3

B. a solution of $NaAlO_2$ is heated with NH_4CI

C. H_2S is passed through a solution of $ZnSO_4$

D. a solution of $ZnSO_4$ is treated with Na_2CO_3

Answer: A::B::C::D

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31. Which of the following mixtures, of ions in solution can be separated by using NaOH solution?

A. Fe^{+3} and Pb^{+2}

B. Pb^{+2} and Sn^{+2}

C. Zn^{+2} and Sn^{+2}

D. Al^{+3} and Cu^{+2}

Answer: A::D

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32. Which of the following ions can be separated by using dil. HCI?

A. Ag^{+} and Cu^{+2}

B. Ag^{+} and Hg^{+2}

C. Hg^{+2} and Cd^{+2}

D. Ag^{+} and Al^{+3}

Answer: A::C::D

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33. Which of the following ions can be separated by using NH_4CI and NH_4OH?

A. Fe^{+3} and Cr^{+3}

B. Cr^{+3} and Co^{+2}

C. Cr^{+3} and Al^{+3}

D. Al^{+3} and Ba^{+2}

Answer: B::D

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34. The cation which gives a yellow precipitate with potassium chromate is

A. Ba^{+2}

B. Pb^{+2}

C. Ca^{+2}

D. K^{+}

Answer: A::B

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35. In which of the following cases will a violet colouration be observed?

A. An alkaline solution of sodiumnitroprusside is treated with a solution of Na_2S

B. a solution of sodiumnitroprusside in aq.NaOH is treated with Na_2SO_3

C. a solution of cobalt nitrite treated with KCI.

D. a solution of $Mn(NO_3)_2$ is treated with sodium bismuthate (or) red lead in presence of conc. HNO_3

Answer: A::D

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36. A white sublimable solid, when boiled with a NaOH solution, give a colour less gas thal turns Nessler's Teagent brown. The solid on being

heated with solid $K_2Cr_2O_7$ and conc. H_2SO_4, gives red brown vapours.

The white solid can be

A. NH_4Cl

B. NH_4Br

C. NH_4I

D. $(NH_4)_2SO_4$

Answer: A::B

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37. Which of the following salts are black in colour?

A. PbS

B. HgS

C. Bi_2S_3

D. CuS

Answer: A::B::D

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38. Which of the following cations precipitates as their chlorides?

A. Pb^{2}

B. Ag^{+}

C. Hg_{2}^{+2}

D. Cd^{+2}

Answer: A::B::C

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Level Ii Lecture Sheet Exercise Ii Linked Comprehension Type Questions

1. A compound (A) is greenish crystalline salt, which gave the following results.

i) Addition of $BaCl_2$ solution to the solution of (A) results in the formation of white ppt. (B). which is insoluble in dil HCL

ii) On heating (A), water vapours and two oxides of sulphur, (C) and (D) are liberated leaving a red brown residue (E)

iii) (E) dissolves in warm conc. HCI to give a yellow solution (F).

iv) With H2S the solution (F) yields a pale yellow ppt. (G) which when filtered, leaves a greenish filtrate (H).

v) Solution (F) on treatment with thiocynaate ions gives blood red coloured compound (I).

Compound (A) is

A. $CuSO_4$

B. $MnSO_4$

C. $FeSO_4$

D. Na_2SO_4

Answer: C

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2. A compound (A) is greenish crystalline salt, which gave the following results.

i) Addition of $BaCl_2$ solution to the solution of (A) results in the formation of white ppt. (B). which is insoluble in dil HCL

ii) On heating (A), water vapours and two oxides of sulphur, (C) and (D) are liberated leaving a red brown residue (E)

iii) (E) dissolves in warm conc. HCI to give a yellow solution (F).

iv) With HS the solution (F) yields a pale yellow ppt. (G) which when filtered, leaves a greenish filtrate (H).

v) Solution (F) on treatment with thiocynaate ions gives blood red coloured compound (I).

White ppt (B) is of

A. K_2SO_4

B. $BaSO_4$

C. $FeSO_4$

D. $CuSO_4$

Answer: B

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3. A compound (A) is greenish crystalline salt, which gave the following results.

i) Addition of $BaCl_2$ solution to the solution of (A) results in the formation of white ppt. (B). which is insoluble in dil HCL

ii) On heating (A), water vapours and two oxides of sulphur, (C) and (D) are liberated leaving a red brown residue (E)

iii) (E) dissolves in warm conc. HCI to give a yellow solution (F).

iv) With HS the solution (F) yields a pale yellow ppt. (G) which when filtered, leaves a greenish filtrate (H).

v) Solution (F) on treatment with thiocynaate ions gives blood red coloured compound (I).

The yellow solution is of

A. $FeCl_3$

B. $CuCl_2$

C. $PbCl_2$

D. $MnCl_2$

Answer: A

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4. A hydrocarbon (X) with vapour density = 27 containing C = 88.88% decolourizes $KMnO_4$ and Br_2 water without evolving HBr. It gave no ppt. with ethereal ammonical $AgNO_3$ or Cu_2CI_2 When reacted with dil. H_2SO_4 in the presence of mercuric sulphate, methyl ethyl ketone (Y) is formed.

The compound is

A. C_8H_{12}

B. C_4H_6

C. C_2H_3

D. C_5H_{10}

Answer: B

Watch Video Solution

5. A hydrocarbon (X) with vapour density = 27 containing C = 88.88% decolourizes $KMnO_4$ and Br_2 water without evolving HBr. It gave no ppt. with ethereal ammonical $AgNO_3$ or Cu_2CI_2 When reacted with dil. H_2SO_4 in the presence of mercuric sulphate, methyl ethyl ketone (Y) is formed.

The compound is

A. But-1-yne

B. But-2-yne

C. Cyclobutene

D. Methylcyclopropane

Answer: B

Watch Video Solution

6. A hydrocarbon (X) with vapour density = 27 containing C = 88.88% decolourizes $KMnO_4$ and Br_2 water without evolving HBr. It gave no ppt. with ethereal ammonical $AgNO_3$ or Cu_2CI_2 When reacted with dil. H_2SO_4 in the presence of mercuric sulphate, methyl ethyl ketone (Y) is formed.

The compound is

A. $CH_3 - \underset{\underset{C_2H_5}{|}}{C}\ H - CH_2 - \underset{\underset{O}{||}}{C} - C_2H_5$

B. $CH_3 - \underset{\underset{C_2H_5}{|}}{C}\ H = CH - \underset{\underset{O}{||}}{C} - C_2H_5$

C. $CH_3 - \underset{\underset{C_2H_5}{|}}{C} = \overset{\overset{CH_3}{|}}{C} - \underset{\underset{O}{||}}{C} - CH_2 - CH_3$

D. $CH_3 - \underset{\underset{C_2H_5}{|}}{C} = CH - \underset{\underset{O}{||}}{C} - CH_3$

Answer: B

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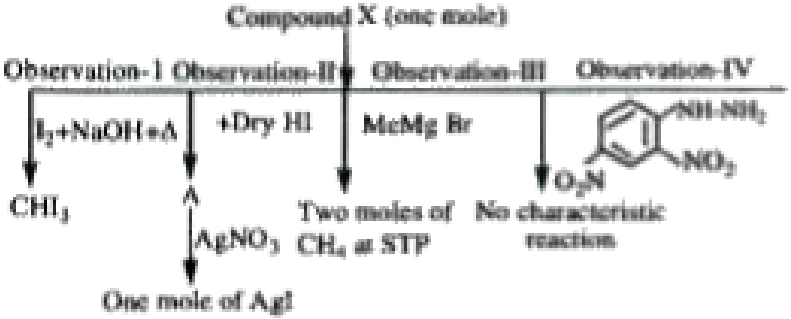
7. A compound (X) gives

Observation - I: +ve Todoform test

Observation - II : One mole of organic compound gives one mole of AgI by Zeisel's method

Observation - III : One mole gives 2 moles of CH_4 with excess of methyl magnesium bromide.

Observation - IV: Gives no test for 2,4- DNP and no ppt. with $AgNO_3$



From observations - I and II it can be predicted that the compound (X) contains

A. $-\underset{\underset{O}{||}}{C}-CH_3$ group

B. $-\underset{\underset{OH}{|}}{C}H-CH_3$ group

C. $-\underset{\underset{NH_2}{|}}{C}H-CH_3$ group

D. $-\underset{\underset{O}{||}}{C}-Cl_3$ group

Answer: B

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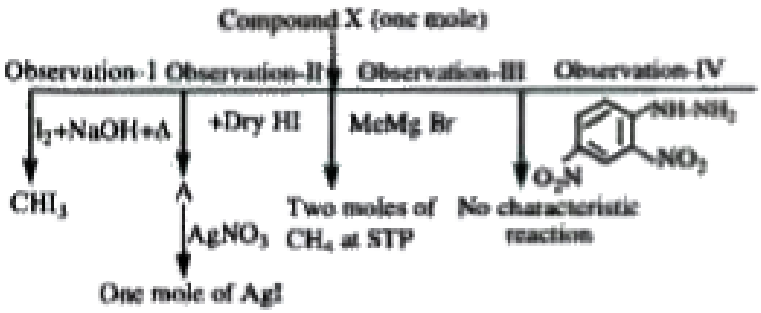
8. A compound (X) gives

Observation - I: +ve Todoform test

Observation - II : One mole of organic compound gives one mole of AgI by Zeisel's method

Observation - III : One mole gives 2 moles of CH_4 with excess of methyl magnesium bromide.

Observation - IV: Gives no test for 2,4- DNP and no ppt. with $AgNO_3$



The observation-II predicts the presence of

A. $2-OCH_3$ group

B. $3-OCH_3$ group

C. $I-OCH_3$ group

D. $I-NH_2$ group

Answer: C

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9. A compound (X) gives

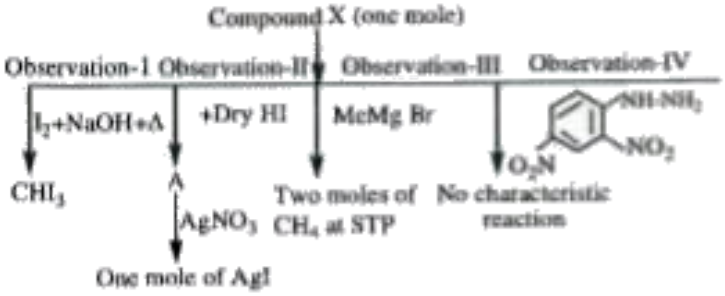
Observation - I: +ve Todoform test

Observation - II : One mole of organic compound gives one mole of AgI by

Zeisel's method

Observation - III : One mole gives 2 moles of CH_4 with excess of methyl magnesium bromide.

Observation - IV: Gives no test for 2,4- DNP and no ppt. with $AgNO_3$



The observation-Ill predicts the presence of

A. $1-OCH_3$ group

B. $2-OCH_3$ group

C. 2 -OH group

D. 1 -OH group

Answer: C

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Level Ii Lecture Sheet Exercise Iii Match The Following Questions

1. Match the following

List - I (Mixture)	List - II (Method of separation)
A) Aniline and Naphthalene	p) Chromatography
B) Glycerol and spentlye	q) Steam distillation
C) Benzoic acid	r) Distillation under reduced pressure
D) Amino acids from mixture	s) Sublimation

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2. Match the following

List - II (Reaction)	List - II (Product/colour)
A) $Na_2[Fe(CN)_5NO] + Na_2S \rightarrow$	p) Yellow ppt. of $(NH_4)_3PO_4.12\ MoO_3$
B) $NaSCN + FeCl_3 \rightarrow$	q) Blue colouration due to $Fe_4[Fe(CN)_6]_3$
C) $Na_4[Fe(CN)_6] + Fe^{3+} \rightarrow$	r) Blood red colour due to $Fe(SCN)_3$
D) $Na_3PO_4 + (NH_4)_2MoO_4 \xrightarrow{HNO_3}$	s) Violet colour due to $Na_4[Fe(CN)_5NOS]$

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3. Match the following

List - I	List - II
A) Presence of halogen	p) $HNO_3/AgNO_3$
B) Presence of sulphur	q) Na_2 [Fe $(CN)_5$ NO]
C) Presence of nitrogen	r) H^+ / $FeSO_4$
D) Presence of nitrogen and sulphur	s) $FeCl_3$

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4. Match the following

List - I	List - II
A) Cerric ammonium nitrate	p) – COOH
B) $FeCl_3$	q) 1^0 , 2^0 , 3^0 - OH groups in compound
C) $NaHCO_3$	r) PhOH
D) Victor Meyer's test	s) R–OH

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5. Match the following

List - I	List - II
A) Ammonical $AgNO_3$	p) Detect or confirm the position of double bonds
B) I_2 / NaOH	q) Presence of strongly acidic groups
C) $NaHCO_3$	r) Presence of acetylinic group or - CHO group
D) Ozonolysis	s) Presence of $-\underset{\text{OH}}{\underset{\vert}{CH}}-CH_3$

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6. Match the following

List - I	List - II
A) Edman reagent	p) Phenyl isothiocyanate
B) Hofmann mustard	q) diethyl oxalate oil reagent
C) Lucas reagent	r) Sodium nitrite in conc. H_2SO_4
D) Liebermann reagent	s) Anhydrous zinc chloride and conc. HCl

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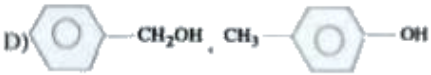
7. Match the following

List - I	List - II
A) 	p) I_2/OH^-
B) $CH_3\overset{O}{\overset{\|}{C}}CH_2\overset{O}{\overset{\|}{C}}H, CH_3-\overset{O}{\overset{\|}{C}}CH_2\overset{O}{\overset{\|}{C}}-OH$	q) anhydrous $ZnCl_2/HCl$
C) HCOOH, HCHO	r) $C_6H_5SO_2Cl$
D) 	s) $NaHCO_3$

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8. Match the following

List - I	List - II
A) Baeyer's reagent	p) C_6H_5-SO_2Cl
B) Ceric ammoniumnitrate	q) ammonical $AgNO_3$
C) Hinsberg reagent	r) Alkine $KMnO_4$
D) Tollen's reagent	s) $(NH_4)_2[Ce(NO_3)_6]$

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9. Match the following

List - I	List - II
A) Sodium nitroprusside	p) $[Fe(H_2O)_5NO]SO_4$
B) Chromyl chloride	q) $Fe_4(Fe(CN)_6)_3$
C) Brown ring	r) $Na_2[Fe(CN)_5NO]$
D) Prussianblue	s) CrO_2Cl_2

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Level Ii Lecture Sheet Exercise Iv Integer Answer Type Questions

1. A sample of gascous hydrocarbon occupying 11.2 lit at NTP. When completely burnt in air produced 22 g CO_2 and 18 g H_2O. Calculate the weight of hydrocarbon taken (in grams)?

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2. A sample of gaseous hydro carbon occupying 1 lit at NTP. When completely burnt in air produced 1.964g CO_2 and 1.607 g H_2O. Calculate the volume of O_2 (lit) at NTP required for its combustion.

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3. In a gravimetric determination of P, an aqueous solution of dihydrogen phosphate ion $H_2PO_4^-$ is treated with a mixture of Ammonium and magnesium ions to precipitate magnesium ammonium phosphate $[Mg(NH_4)PO_4.6H_2O]$.This is heated and decomposed to magnesium pyrophosphate $(Mg_2P_2O_7)$. Which is weighed. A solution of $H_2PO_4^-$ yielded 1.85 g of $Mg_2P_2O_7$. What weight (grams) of NaH_2PO_4 was present originally.

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4. A 62 g quantity of white phosphorous was burned in an excess of Oxygen and the product was dissolved in water to form of an acid.

Calculate the number of moles of acid obtained.

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Practice Sheet 1 Single Answer Questions

1. Brown ring test is for

A. NO_3^-

B. Cl^-

C. I

D. Br^-

Answer: A

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2. Sulphide ions react with $Na_2\left[Fe(NO)(CN)_5\right]$ from a purple coloured compound $Na_4\left[Fe(CN)_5(NOS)\right]$. In the reaction, the oxidation state of iron

A. changes from +2 to +3

B. changes from +3 to +2

C. changes from +2 to +4

D. does not change

Answer: D

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3. A solution on treatment with NH_3 turns blue, contains

A. Cu^{+2}

B. Ni^{+2}

C. Co^{+2}

D. Mn^{+2}

Answer: A

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4. Few drops of HNO_3 are added to II group before proceeding to III group in order to

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

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

C. ppt III group

D. convert Fe^{2+} to Fe

Answer: A

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5. The aqueous solution of salt gives white ppt with lead acetate solution which is insoluble in hot water and nitric acid. The salt contains

A. Cl^-

B. Ba^{++}

C. CO_3^{2-}

D. SO_4^{2-}

Answer: D

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6. A salt when heated with H_2SO_4 librates violet gas which turns starch paper blue, salt may be

A. $NaNO_3$

B. NaBr

C. NaI

D. NaCl

Answer: C

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7. Nitric acid is generally not used for preparation of original solution in analysis of basic radicals, because it

A. is oxidising agent

B. is reducing agent

C. forms insoluble nitrates

D. forms soluble nitrates

Answer: A

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8. When dimethyl glyoxime solution is added to an aqueous solution of nickel chloride in presence of ammonium hydroxide

A. a black ppt is formed

B. a blue ppt is formed

C. a rose red ppt is formed

D. violet ppt is formed

Answer: C

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9. Sulphuric acid is not used for preparation of original solution in analysis of basic radicals because

A. it is a reducing agent

B. it forms insoluble sulphate with certain basic radicals

C. it forms a soluble complex

D. it is viscous in nature

Answer: B

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10. Fe, Al and Cr are grouped together in qualitative analysis, because

A. these have three electrons in valency shell.

B. their hydroxides are insoluble

C. their valency is three

D. their sulphides are soluble in water

Answer: B

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Practice Sheet 1 More Than One Correct Answer Questions

1. Which of the following cations precipitates as their hydroxides?

A. Fe^{+3}

B. Al^{+3}

C. Cr^{2+}

D. Zn^{+2}

Answer: A::B::C

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2. Which of the following cations precipitates as their sulphides?

A. Cu^{+2}

B. Pb^{+2}

C. Zn^{+2}

D. Ni^{+2}

Answer: A::B::C::D

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3. Which of the following cations precipitates as their carbonates?

A. Ca^{+2}

B. Sr^{+2}

C. Ba^{+2}

D. Zn^{+2}

Answer: A::B::C

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4. Which of the following ions form a white ppt. with ammonium oxalate?

A. Ca^{+2}

B. Sr^{+2}

C. Ba^{+2}

D. Fe^{+2}

Answer: A::B::C

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5. Which of the following sulphides are soluble in yellow ammonium sulphide?

A. As_2S_3

B. Bi_2S_3

C. Sb_2S_3

D. SnS

Answer: A::C::D

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6. Which of the following change the colour of aqueous solution of $FeCl_3$?

A. $K_4[Fe(CN)_6]$

B. H_2S

C. NH_4CNS

D. KCNS

Answer: A::B::C::D

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Practice Sheet 1 Comprehension Type Questions

1. A bluish green coloured compound 'A' on heating gives two products 'B' and 'C'. A metal 'D' is deposited on passing H_2 through heated 'B'. The compound 'A' and 'B' are insoluble in water. 'B' is black in colour, dissolves

in HCI and on treatment with $K_4[Fe(CN)_6]$ gives a chocolate brown ppm of compound 'E'. 'C' is colourless, odourless gas and turns lime water milkly.

Compound 'A' is

A. $CuSO_4$

B. $CuCO_3$

C. $FeSO_4$

D. $CrCl_3$

Answer: B

Watch Video Solution

2. A bluish green coloured compound 'A' on heating gives two products 'B' and 'C'. A metal 'D' is deposited on passing H_2 through heated 'B'. The compound 'A' and 'B' are insoluble in water. 'B' is black in colour, dissolves in HCI and on treatment with $K_4[Fe(CN)_6]$ gives a chocolate brown ppm of compound 'E'. 'C' is colourless, odourless gas and turns lime water

milkly.

The compounds 'B' and 'C' are respectively

A. CuS, SO_2

B. CuO, CO_2

C. FeO, H_2S

D. Cr_2O_3, CO

Answer: B

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3. A bluish green coloured compound 'A' on heating gives two products 'B' and 'C'. A metal 'D' is deposited on passing H_2 through heated 'B'. The compound 'A' and 'B' are insoluble in water. 'B' is black in colour, dissolves in HCI and on treatment with $K_4\left[Fe(CN)_6\right]$ gives a chocolate brown ppm of compound 'E'. 'C' is colourless, odourless gas and turns lime water milkly.

The compounds 'D' and 'E' are respectively

A. $Cu, Cu_2[Fe(CN)_6]$

B. $Fe, Cu_2[Fe(CN)_6]$

C. $Cr, CuCO_3$

D. Zn, CuO

Answer: A

Watch Video Solution

4. $Al(OH)_3 \downarrow (\text{white}) + OH^- \rightarrow [Al(OH)_4]^-$ soluble complex

White precipitate of $Al(OH)_3$ reappears when

A. a solution of ammonium chloride is added

B. a solution of ammonia is added

C. concentrated HNO_3 is added in excess

D. all of these

Answer: A

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5. $Al(OH)_3 \downarrow (\text{white}) + OH^- \rightarrow [Al(OH)_4]^-$ soluble complex

Identify the correct statement with respect to the gelatinous white precipitate of aluminum hydroxide.

A. Fresh precipitate dissolves by the addition of strong acid and base

B. Precipitate develops red lake with alizarin reagent.

C. White precipitate is slightly soluble in excess of ammonia solution.

D. all of these

Answer: D

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6. $Al(OH)_3 \downarrow (\text{white}) + OH^- \rightarrow [Al(OH)_4]^-$ soluble complex

$Fe(OH)_3$ precipitate and $Al(OH)_3$ precipitate can be separated by

A. increasing the OH^- concentration by sodium hydroxide.

B. increasing the H^+ concentration by hydrochloric acid,

C. (a) and (b) both

D. none

Answer: A

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7. Match the following

List - I	List - II
A) Lithium	p) Brick red
B) Barium	q) Apple green
C) Calcium	r) Crimson red
D) Magnesium	s) No flame colour

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Practice Sheet 1 Integer Answer Type Questions

1. Match the following

List - I (functional group)	List - II (reagent)
A) – OH	p) ceric ammonium nitrate
B) – COOH	q) $NaHCO_3$
C) >C = O	r) 2,4 – DNP
D) – NH_2	s) $C_6H_5SO_2Cl$

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2. 1 g of an organic compoud on treatment with fuming nitric acid and $BaCl_2$ solution gave 0.29125 g of $BaSO_4$ calculate the percentage of sulphur in the compound.

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3. In Kjeldahl's method 0.12 g of organic substance liberated ammonia. It is absorbed in 40ml of 0.05N acid. Which is neutralised by 27.5 ml of 0.05 N base. Calculate the percentage of nitrogen in the given compound.

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4. 1 g of an organic compound containing oxygen is heated with graphite and carbon monoxide formed is quantitatively converted to 0.1375 g CO_2 on reaction with I_2O_5 calculate the percentage of oxygen in the compound.

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5. In the following the number metal sulphides are not dissolve in yellow ammonium polysulphide. Hg^{+2}, Pb^{+2}, Bi^{+3}, Cu^{+2}, As^{+3}, $Sn^{+2}Sb^{+5}$

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6. In Chromyl ion oxidation state of chromium is _____

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7. The number of Chiral carbons in α-D-Glucose are _____

Watch Video Solution

Practice Sheet 2 Single Answer Questions

1. Which of the following ion is not precipitated either by HCl or H_2S

A. Ag^{+}

B. Cu^{+2}

C. Pb^{+2}

D. Mg^{+2}

Answer: D

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2. A colourless salt gives violet colour in bunsen flame, it may be

A. Na_2CO_3

B. $NaCrO_4$

C. K_2CO_3

D. $BaCO_3$

Answer: C

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3. Borax when heated on platinum wire forms a glass like bead which is made up of

A. sodium tetraborate

B. sodium metaborate

C. sodium metaborate and boric anhydride

D. boric anhydride and sodium tetraborate

Answer: C

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4. A minute quantity of cupric salt when heated on borax bead in reducing flame on bunsen burner, the colour of bead after cooling will be

A. blue

B. brown red

C. colourless

D. green

Answer: B

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5. A white salt is insoluble in cold water but soluble in boiling water. Its solution when treated with potassium chromate solution gives yellow precipitate. The salt may be :

A. $BaCl_2$

B. $SrCl_2$

C. $PbCl_2$

D. $Hg(NO_3)_2$

Answer: C

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6. Two test tubes containing a nitrate and a bromide are treated separately with conc, H_2SO_4 brown fumes evolved are passed in water. The water will be coloured by vapours evolved from the test tube containing

A. nitrate

B. bromide

C. both

D. none

Answer: B

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7. Ferric ion forms a prussian blue coloured precipitate with $K_4\left[Fe(CN)_6\right]$ a due to the formation of

A. $K_3Fe(CN)_6$

B. $Fe_4\left[Fe(CN)_6\right]_3$

C. $Fe(OH)_3$

D. $KFe\left[Fe(CN)_6\right]$

Answer: B

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8. When H_2S is passed through Hg_2^{2+}, we get

A. HgS

B. $HgS + Hg_2S$

C. HgS+Hg

D. Hg_2S

Answer: D

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9. The compound soluble in acetic acid is

A. calcium oxide

B. calcium carbonate

C. calcium oxalate

D. calcium hydroxide

Answer: A::B::D

View Text Solution

10. Each of these solution is added to a mixture of aqueous solutions of Iodide and chloroform separately. Which will give positive test for Iodine when the solutions are vigorously mixed?

A. NaCl solution

B. NaBr solution

C. Chlorine water

D. Bromine water

Answer: C::D

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11. Which of the following compound on treatment with a solution of $HgCl_2$ first gives a white ppt. and then grey ppt.?

A. H_3PO_2

B. $SnCL_2$

C. KI

D. NH_3

Answer: A::B::C::D

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12. The reagents ammonium chloride and aqueous ammonia will precipitate

A. Bi^{+3}

B. Pb^{+2}

C. Mg^{2+}

D. Fe^{+3}

Answer: A::B::D

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13. Which of the following statement(s) is (are) correct?

A. Cu^{+2} salts form soluble complex with excess KCN

B. Cu^{+2} salts form soluble complex with aqueous ammonia

C. Cu^{+2} salts form soluble complex with KI

D. A Piece iron or Zn when place in Cu^{+2} salt solution precipitates copper.

Answer: A::B::D

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14. The ions that can be precipitated by both HCl and H_2S are

A. Pb^{+2}

B. Cu^{+2}

C. Ag^{+}

D. Sn^{+2}

Answer: A::B::C

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15. $K_4\left[Fe(CN)_6\right]$ can be used to detect

A. Fe^{+2}

B. Fe^{+3}

C. Zn^{+2}

D. Cu^{+2}

Answer: A::B::C::D

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Practice Sheet 2 Linked Comprehension Type Questions

1. A basic volatile compound gave a foul smelling gas when treated with $CHCl_3$ and alc. KOH. A 0.295 g sample of the substance dissolved in aqueous HCl and treated with $NaNO_3$ solution at $0^\circ C$ liberated a colourless, odourless gas whose volume corresponds to 112 ml at STP. After the evolution of gas was complete, the aqueous solution gave an organic liquid which did not contain nitrogen and on boiling with I_2 in the presence of alkali gave a yellow precipitate.

The compound must contain

A. $CH_3 - NH_2$

B. $-\underset{\underset{NH_2}{|}}{C}H - CH_3$

C. $-\underset{\underset{OH}{|}}{C}H - CH_3$

D. $-\underset{\underset{CH_3}{|}}{N}-CH_3$

Answer: B

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2. A basic volatile compound gave a foul smelling gas when treated with $CHCl_3$ and alc. KOH. A 0.295 g sample of the substance dissolved in aqueous HCl and treated with $NaNO_3$ solution at $0^\circ C$ liberated a colourless, odourless gas whose volume corresponds to 112 ml at STP. After the evolution of gas was complete, the aqueous solution gave an organic liquid which did not contain nitrogen and on boiling with I_2 in the presence of alkali gave a yellow precipitate.

The molecular weight of the basic volatile compound is

A. 59

B. 43

C. 69

D. 73

Answer: A

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3. A basic volatile compound gave a foul smelling gas when treated with $CHCl_3$ and alc. KOH. A 0.295 g sample of the substance dissolved in aqueous HCl and treated with $NaNO_3$ solution at $0^\circ C$ liberated a colourless, odourless gas whose volume corresponds to 112 ml at STP. After the evolution of gas was complete, the aqueous solution gave an organic liquid which did not contain nitrogen and on boiling with I_2 in the presence of alkali gave a yellow precipitate.

When the basic volatile compound is reacted with $CHCI_3$ and KOH a new compound is formed. This new compound on reduction gives

A. $CH_3 - \underset{\underset{NH_2}{|}}{C}\ H - CH_3$

B. $CH_3 - \underset{\underset{NC}{|}}{C}\ H - CH_3$

C. $CH_3 - \underset{\underset{NH-CH_3}{|}}{C} H - CH_3$

D. $CH_3 - \underset{\underset{OCH_3}{|}}{C} H - CH_3$

Answer: C

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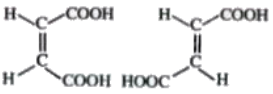
4. A mixture of carboxylic acids (X) and (Y) cannot be separated by normal methods however when this mixture is treated with optically active quinine give optically active salts (P) and (Q). These two salis can be separated by fractional crystallization, separated and acidified with HCl to form amines and carboxylic acids.

The compound (X) and (Y) may be

A. CH_3COOH, CH_3CH_2COOH

B. 

C. (+) and (-) - Tartaric acid

D. $CH_3CH_2CH_2COOH, CH_3CH_2CH_2CH_2COOH$

Answer: C

Watch Video Solution

5. A mixture of carboxylic acids (X) and (Y) cannot be separated by normal methods however when this mixture is treated with optically active quinine give optically active salts (P) and (Q). These two salis can be separated by fractional crystallization, separated and acidified with HCl to form amines and carboxylic acids.

(P) and (Q) are separated by fractional crystallization due to

A. Difference in boiling point

B. Difference in solubility

C. Difference in melting point

D. Difference in thermal stability

Answer: B

Watch Video Solution

6. A mixture of carboxylic acids (X) and (Y) cannot be separated by normal methods however when this mixture is treated with optically active quinine give optically active salts (P) and (Q). These two salis can be separated by fractional crystallization, separated and acidified with HCl to form amines and carboxylic acids.

What is the diastereoisorner of (+) -tartaric acid ?

A. (-) - Tartarie acid

B. Maleic acid

C. Meso-Tartaric acid

D. All of these

Answer: C

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Practice Sheet 2 Match The Following Questions

1. Match the following

List - I	List - II
A) Pb^{2+}	p) Ist group
B) Cu^{2+}	q) zero group
C) NH_4^+	r) III group
D) Al^{3+}	s) II group

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2. Match the following

List - I	List - II
A) dil $HCl+H_2S$	p) Detection of NH_4^+ ion
B) NH_4OH+H_2S	q) Detection of Mg^{+2} ion
C) Nessler's reagent	r) Detection of IInd group cations
D) $NH_4OH+Na_2HPO_4$	s) Detection of IVth group cations

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Practice Sheet 2 Integer Answer Type Questions

1. 0.188 g of silver bromide is obtained from 4 g of an organic compound. Calculate the percentate of bromine in the compound

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2. On combustion of 0.2475 g of an organic compound 0.4950 g of CO_2 and 0.2025 g of H_2O were obtained. Find out the percentage of hydrogen.

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3. 0.245 g of nitrogenous organic compound was Kjeldahlised and ammonia was absorbed in 10 ml of 0.1 N H_2SO_4. The unreacted acid requires 3ml of 0.1N NaOH for complete neutralization. Calculate the percentage of nitrogen in the organic compound.

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4. The brown ring complex compound is formulated as $\left[Fe(H_2O)_5NO\right]SO-4$ The oxidation states of iron is

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5. In the following cations number of ions are given by the Borax Bead Test

$Na^+, Ca^{+2}, Al^{+3}, Cr^{+3}, Zn^{+2}, Fe^{+2}, Mg^{+2}, Ba^{+2}, K^+, Li^+$

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6. In the given statements the number of statements are incorrect

Statement-1 : Hydrated Cu(II) salts are blue and anhydrated salts Cu(II) salts are colourless.

Statement-2 : $HgCl_2$ A white sublimable substance that in solution forms a white precipitate with NH_3

Statement-3: Separation of Cu^{+2} and Zn^{+2} ions is not possible by using NaOH.

Statement-4 : Pb^{+2}, Ag^{+} cations can be separated by using an NH_3 solution.

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7. In the following colourless/white sulphides is/are

CdS, PbS, HgS, CuS, FeS, ZnS, NiS, Bi_2S_3

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Practice Sheet 3 Single Answer Questions

1. Compound (X) of molecular formula C_4H_8 takes up one equivalent of hydorgen in presence of Pt to form another compound (Y). [Y] on ozonolysis gives acetaldehyde as the only product. Compound [X] is :

A. $a.\ CH_3 - CH_2 - CH = CH_2$

B. $b.\ CH_3 - CH = CH - CH_3$

C. c. Cyclobutane

D. d. Cyclobutene

Answer: B

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2. An unknown organic compound is soluble in water. It gives negative test with 2. 4-DNP but positive test with Lucas reagent. Compound should have :

A. - COOH group

B. $-OH$ group

C. Keto group

D. Amide group

Answer: B

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3. Compound [X] gives positive test with 2, 4-DNP and with $I_2/NaOH$ compound [X] may be

A. $C_6H_5COCH_3$

B. CH_3COCH_3

C. $CH_3 - CHO$

D. all of these

Answer: D

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4. Lassaigne's extract of m-nitrochlorobenzene is acidified with dil. HNO_3 and then treated with $AgNO_3$ solution, the white precipitate formed is due to :

A. AgCl

B. AgCN

C. both (a) and (b)

D. Ag_2O

Answer: C

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5. Which of the following is true ?

A. Alcohol gives red colour solution with cerric ammonium nitrate

B. Aldehydes and ketones give red coloured precipitate with 2, 4-DNP

C. Aliphatic as well as aromatic carboxylic acids give CO_2 with $NaHCO_3$

D. all are true

Answer: D

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6. Which of the following is true ?

A. Tollens reagent gives a positive test with all aldehydes

B. Fehling solution gives a positive test with all aldehydes

C. Tollens reagent gives a positive test with α-methyl ketones

D. Tollens reagent gives a positive test with all carboxylic acids

Answer: A

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7. An organic compound [X] of the formula C_7H_8O is soluble in NaOH but not in $NaHCO_3$. It gives colour with alcoholic $FeCl_3$. On treatment with bromine water it gives a tribromo product. The compound (A) is :

A. o-cresol

B. m-cresol

C. p-cresol

D. None of the three

Answer: B

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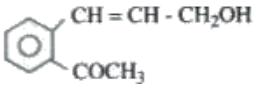
Practice Sheet 3 More Than One Correct Answer Questions

1. An organic compound containing one oxygen gives red colour with cerric ammonium nitrate solution, decolorises alkaline $KMnO_4$ solution, responds iodoform test and shows geometrical isomerism. It should be:

A. $C_6H_5 - CH = CH - CH_2OH$

B. $C_6H_5 - CH = CH - CHOHCH_3$

C. $C_6H_5 - CH = CHCOCH_3$

D. 

Answer: B

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2. Which of the following radicals will be precipitated by passing H_2S through a conc. HCI solution?

A. Cu

B. Sb

C. Cd

D. As

Answer: A::B::D

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3. On being heated with conc. HNO_3 and ammonium molybdate solution, the salt solutions gives a yellow precipitate. The salt(s) may be

A. Na_2HPO_4

B. As_2O_3

C. $FeSO_4$

D. $BaCl_2$

Answer: A::B

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4. The reagent NH_4CI and aqueous NH_3 precipitates:

A. Ca^{2+}

B. Al^{3+}

C. Bi^{3+}

D. Mg^{2+}

Answer: B::C::D

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5. Some salts which give brown vapours with conc, H_2SO_4 may be :

A. Nitrate

B. Chloride

C. Bromide

D. Iodide

Answer: A::C::D

Watch Video Solution

6. Which of the following will respond to positive chromyl chloride test?

A. $CuCl_2$

B. $ZnCl_2$

C. $HgCl_2$

D. None of these

Answer: A::B

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7. Which is (are) insoluble in water ?

A. $PbSO_4$

B. $PbCrO_4$

C. CaF_2

D. Ag_2S

Answer: A::B::C::D

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8. KCN is used for separting

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

B. Mn^{2+} and Zn^{2+}

C. Ba^{2+} and Ca^{2+}

D. Cu^{2+} and Cd^{2+}

Answer: A::D

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9. Which will not give test of Fe^{3+} ions ?

A. $FeCl_3$

B. $K_3\left[Fe(CN)_6\right]$

C. $Fe_4\left[Fe(CN)_6\right]_3$

D. $K_4\left[Fe(CN)_5\right]$

Answer: B

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Practice Sheet 3 Linked Comprehension Type Questions

1. A metal sulphide (A) gives (B) gas with rotten egg and (C) a colourless sulphates, when treated with dil. H_2SO_4 (B) reacts with $K_2Cr_2O_7 / H^+$ to form (D) a white grey element. (D) burns in oxygen to yield (E) a colourless gas. If (B) is added in (E), it gives (D) and colourless liquid, which turns anhydrous $CuSO_4$ blue. (C) gives a precipitate with $NH_{3(aq)}$ or NaOH which dissolves in excess of NaOH.

B is

A. SO_2

B. SO_3

C. H_2S

D. CS_2

Answer: C

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2. A metal sulphide (A) gives (B) gas with rotten egg and (C) a colourless sulphates, when treated with dil. H_2SO_4 (B) reacts with $K_2Cr_2O_7/H^+$ to form (D) a white grey element. (D) burns in oxygen to yield (E) a colourless gas. If (B) is added in (E), it gives (D) and colourless liquid, which turns anhydrous $CuSO_4$ blue. (C) gives a precipitate with $NH_{3(aq)}$ or NaOH which dissolves in excess of NaOH.

C is

A. $CuSO_4$

B. $BaSO_4$

C. $ZnSO_4$

D. Na_2ZnO_2

Answer: C

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3. A metal sulphide (A) gives (B) gas with rotten egg and (C) a colourless sulphates, when treated with dil. H_2SO_4 (B) reacts with $K_2Cr_2O_7/H^+$ to form (D) a white grey element. (D) burns in oxygen to yield (E) a colourless gas. If (B) is added in (E), it gives (D) and colourless liquid, which turns anhydrous $CuSO_4$ blue. (C) gives a precipitate with $NH_{3(aq)}$ or NaOH which dissolves in excess of NaOH.

E is

A. H_2S

B. SO_3

C. SO_2

D. None of these

Answer: C

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4. From analysis and molecular weight determination the molecular formula of a compound (A) is C_3H_7NO. The compound gives the following information.

i) On hydrolysis it gives an amine (B) and Carboxylic acid (C)

ii) Amine (B) reacts with benzne sulphonyl chloride and gives a product which is insoluble in aqouesous sodium hydroxide solution

iii) Acid (C) on reaction with Tollens reagent gives a silver mirror.

What is compound (B) ?

A. CH_3NH_2

B. NH_3

C. $NH(CH_3)_2$

D. $CH_3CH_2 - NH_2$

Answer: C

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5. From analysis and molecular weight determination the molecular formula of a compound (A) is C_3H_7NO. The compound gives the following information.

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ii) Amine (B) reacts with benzne sulphonyl chloride and gives a product which is insoluble in aqouesous sodium hydroxide solution

iii) Acid (C) on reaction with Tollens reagent gives a silver mirror.

Compound 'A' is

A. $CH_3 - \overset{O}{\overset{||}{C}} - NH - CH_3$

B. $H - \overset{O}{\overset{||}{C}} - N(CH_3)_2$

C. $CH_3CH_2 - \overset{O}{\overset{||}{C}} - NH_2$

D. $H_2N - CH_2CH_2 - CHO$

Answer: B

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6. From analysis and molecular weight determination the molecular formula of a compound (A) is C_3H_7NO. The compound gives the following information.

i) On hydrolysis it gives an amine (B) and Carboxylic acid (C)

ii) Amine (B) reacts with benzne sulphonyl chloride and gives a product which is insoluble in aqouesous sodium hydroxide solution

iii) Acid (C) on reaction with Tollens reagent gives a silver mirror.

Compound 'C' is

A. $CH_3 - \overset{O}{\overset{||}{C}} - OH$

B. $CH_3CH_2 - \overset{O}{\overset{||}{C}} - OH$

C. $H - \overset{O}{\overset{||}{C}} - OH$

D. None

Answer: C

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Practice Sheet 3 Match The Following Questions

1. Match the following

23. COLUMN - I	COLUMN - II(Precipitating reagent)
A) Hg^{2+}	p) Dil. HCl
B) Pb^{2+}	q) H_2S in presence of HCl
C) Hg^{+}	r) Soluble in yellow ammonium sulphide
D) As^{3+}	s) insoluble in yellow ammonium sulphide

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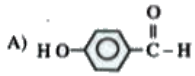
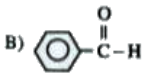
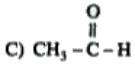
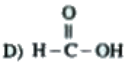
2. Match the following

24. COLUMN - I	COLUMN - II (Precipitating reagent)
A) 	p) Brady's reagent
B) 	q) Tollen's reagent
C) 	r) Neutral $FeCl_3$
D) 	s) Fehling's Solution

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Practice Sheet 3 Integer Answer Type Questions

1. 0.12g of organic compound containing sulphur on treatment with Conc. HNO_3 in a carius tube and then with excess of $BaCl_2$ produced 0.233g of $BaSO_4$. % of 'S' in compound .....

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2. Silver salt of a diabsic acid contains 71.05 % of Ag. M.Wt of acid is ..... x 10

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3. In a gravimetric determination of phosphorus 0.24 gr of an organic compound was strongly heated in carius tube with conc nitric acid. Phosphoric acid so produced was precipitated as $MgNH_4PO_4$ which on ignition yielded 0.444 gr of $Mg_2P_2O_7$ the percentage of phosphorus in the compound is ..... x 10 [Mg = 24, P = 31, O = 16]

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4. In the given statements the number of statements are correct

Statement-1 : Ammonia solution can be separate a mixture of AgCl and AgI.

Statement-2 : ZnS, NiS, MnS sulphides are insoluble in dil.HCI

Statement-3 : Hg_2Cl_2 leaves black residue on addition of NH_3

Statement-4 : AI^{3+}, Mg^{+2} cations can be separated by adding NH_4Cl and NH_4OH to the mixture.

Statement-5 : A white precipitate is obtained when H_2S is passed through a solution of $ZnSO_4$

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5. In the following the cations does not give flame test

$Ba^{+2}, Li^{+}, Ca^{+2}, K^{+}, Na^{+}, Mg^{+2}, Be^{+2}$

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6. The cation gives +ve microcosmic salt (or) phsophate bead test

$Cu^{+2}, Mg^{+2}, Fe^{+2}, Cr^{+3}, Co^{+2}, Zn^{+2}, Al^{+3}, Mg^{+2}, K^{+}, Ca^{+2}, Ba^{+2}$

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Practice Sheet 4 Single Answer Questions

1. Which of the following mixtures can be separated by using an NH_3 solution?

A. Fe^{3+} and Al^{3+}

B. Al^{3+} and Zn^{2+}

C. Sn^{2+} and Pb^{2+}

D. Cu^{2+} and Cd^{2+}

Answer: B

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2. Which of the following reagents will not be useful in separating a mixture of Zn^{2+} and Cu^{2+}

A. H_2S

B. H_2S in an alkaline medium

C. NaOH solution

D. all of the above

Answer: B

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3. A salt imparts a yellow colour to a borax bead in an oxidising flame. What would be the colour of the bead in a reducing flame

A. Green

B. Blue

C. Red

D. Violet

Answer: A

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4. Which of the following pairs of cations will turn borax beads blue in an oxidising flame?

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

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

C. Cu^{2+} and Mn^{2+}

D. Cu^{2+} and Cr^{3+}

Answer: A

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5. A white solid forms Rinmann's green in the charcoal cavity test in an oxidising flame. On treatment with dilute H_2SO_4 this solid produces a gas that turns an acidified dichromate paper green and lead acetate paper black. The white solid is

A. PbS

B. $ZnSO_3$

C. ZnS

D. Na_2S

Answer: C

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6. A mixture of ferrie alum, chrome alum and potash alum is dissolved in water and treated with an excess of an NH_3 solution. The precipitate is filtered and the residue is warmed with a mixture of NaOH and H202 and filtered. We will get

A. a green residue and a yellow filtrate

B. a brown residue and a yellow filtrate

C. a brown residue and a green filtrate

D. a blue residue and a green filtrate

Answer: B

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7. Which of the following sulphides is white?

A. CdS

B. PBS

C. ZnS

D. SnS

Answer: C

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Practice Sheet 4 One Or More Than One Correct Questions

1. Which of the following substances are blue

A. $Fe(BO_2)_2$

B. $CoAl_2O_4$

C. $Co(BO_2)_2$

D. $NaCoPO_4$

Answer: B::C::D

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2. Which of the following cations will turn a borax bead green in an oxidising flame?

A. Fe^{2+}

B. Mn^{2+}

C. Cr^{3+}

D. Cu^{2+}

Answer: A::C

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3. On being strongly heated, which of the following substances will leave a black residue

A. $CuSO_4, 5H_2O$

B. $ZnCO_3$

C. $PbCO_3$

D. $MnSO_4$

Answer: B

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4. Which of the following mixtures of ions in solution can be separated by using an NH_3 solution

A. Hg_2^{2+} and Ag^+

B. Bi^{3+} and Cu^{2+}

C. Ag^+ and Pb^{2+}

D. Cu^{2+} and Cd^{2+}

Answer: A::B::C

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5. Which of the following species will be decomposed on acidification

A. $\left[Ag(NH_3)_2\right]^+$

B. $\left[Cu(NH_3)_4\right]^{2+}$

C. $\left[Zn(OH)_4\right]^{2-}$

D. $\left[Pb(OH)_4\right]^{2-}$

Answer: A::B::C::D

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6. Which of the following combinations in an aqueous medium will give a blue colour or precipitate

A. $Fe^{2+} + \left[Fe(CN)_6\right]^{3-}$

B. $Fe^{3+} + \left[Fe(CN)_6\right]^{4-}$

C. $Co^{2+} + SCN^-$

D. $Fe^{3+} + SCN^-$

Answer: A::B::C

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7. A white precipitate is obtained when

A. a solution of $BaCl_2$ is treated with one of Na_2SO_3

B. a solution of $NaAlO_2$ is heated with NH_4CI

C. H_2S is passed through a solution of $ZnSO_4$

D. a solution of $ZnSO_4$ is treated with one of Na_2CO_3

Answer: A::B::C::D

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8. Which of the following combinations in an aqueous medium will give a red colour or precipitate

A. $Fe^{3+} + SCN^-$

B. $Fe^{3+} + \left[Fe(CN)_5\right]^{3-}$

C. Ni^{2+} dimethylglyoxime + NH_3

D. $Co^{2+} + SCN^-$

Answer: A::B::C

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Practice Sheet 4 Linked Comprehension Type Answer

1. An aqueous solution of a white salt A gives a white precipitate B on treatment with dilute HCI in cold conditions. B is soluble in boiling water. An aqueous solution of A gives a yellow precipitate on treatment with a solution of K_2CrO_4. The soda extract of A is acidified with dilute H_2SO_4 boiled to remove CO_2 and treated with a freshly prepared solution of $FeSO_4$ Concentrated H_2SO_4 is added to the resulting solution (along the walls of the test tube so that the H_2SO_4 forms a separate layer). A brown ring is formed at the junction of the two layers.

On treatment with a Kl solution, an aqueous solution of A will give

A. a yellow precipitate soluble in boiling water

B. a yellow precipitate insoluble in boiling water

C. a white precipitate soluble in boiling water

D. a white precipitate insoluble in boiling water

Answer: A

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2. An aqueous solution of a white salt A gives a white precipitate B on treatment with dilute HCI in cold conditions. B is soluble in boiling water. An aqueous solution of A gives a yellow precipitate on treatment with a solution of K_2CrO_4. The soda extract of A is acidified with dilute H_2SO_4 boiled to remove CO_2 and treated with a freshly prepared solution of $FeSO_4$ Concentrated H_2SO_4 is added to the resulting solution (along the walls of the test tube so that the H_2SO_4 forms a separate layer). A brown ring is formed at the junction of the two layers.

On treatment with a Kl solution, an aqueous solution of A will give

A. a white precipitate soluble in an excess of NH_3

B. a white precipitate soluble in an excess of NH_3

C. a grey precipitate soluble in an excess of NH_3

D. a grey precipitate insoluble in an excess of NH_3

Answer: B

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3. The salt A is

A. $PbBr_2$

B. $Pb(NO_3)_2$

C. $AgNO_3$

D. $Hg_2(NO_3)_2$

Answer: B

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4. (i) A white solid A, on being strongly heated, leaves a residue which is yellow while hot and white when cold

ii) The solid A, insoluble in water, dissolves in dilute HCI to give a solution B and a gas which does not affect acidified dichromate paper but turns baryta water milky.

iii) When H_2S is passed through the solution B, a white precipitate C is obtained

iv) The precipitate C dissolves in dilute HCI to give a solution which, when treated with an NaOH solution, gives a white precipitate. The final precipitate dissolves in an excess of NaoH form a solution D. This alkaline solution, on acidification with acetic acid followed by treatment with H_2S , gives the precipitate C.

The salt A is a

A. sulphite

B. carbonate

C. sulphide

D. chloride

Answer: B

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5. (i) A white solid A, on being strongly heated, leaves a residue which is yellow while hot and white when cold

ii) The solid A, insoluble in water, dissolves in dilute HCI to give a solution B and a gas which does not affect acidified dichromate paper but turns baryta water milky.

iii) When H_2S is passed through the solution B, a white precipitate C is obtained

iv) The precipitate C dissolves in dilute HCI to give a solution which, when treated with an NaOH solution, gives a white precipitate. The final precipitate dissolves in an excess of NaoH form a solution D. This alkaline solution, on acidification with acetic acid followed by treatment with H_2S , gives the precipitate C.

Given that the formation of the precipitate C from the solution D involves the reaction

$$\left[M(OH)_4\right]^{2-} + 4H^+ \rightarrow \underset{\underset{MS\downarrow}{\downarrow H_2S}}{M^{2+}} + 4H_2O$$

M is

A. Zn

B. Al

C. Pb

D. Sn

Answer: A

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6. In para (iv), if NaOH is replaced by an NH_3 solution, what will the solution D contain?

A. $\left[Zn(NH_3)_4\right]^{2+}$

B. $\left[AI(OH)_4\right]^-$

C. $\left[Pb(NH_3)_4\right]^{2+}$

D. SnO_2^{2-}

Answer: A

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Practice Sheet 4 Match The Following Questions

1. Match the following

List - A	List - B
A) Colour acidified $KMnO_4$ is discharged	p) Gas evolved by the action of dilute H_2SO_4 on a sulphite
B) Acidified dichromate solution is turned	q) Gas evolved by the action of dilute H_2SO_4 on a carbonate
C) Nessler's reagent gives a brown precipitate	r) Gas evolved by heating an ammonium salt with NaOH
D) Baryta water turns milky	s) Gas evolved by the action of dilute H_2SO_4 on a sulphide

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2. Match the following

List - A	List - B
A) CO_2	p) gives a black precipitate with a lead acetate solution
B) SO_2	q) turns lime water milky
C) H_2S	r) turns alkaline nitroprusside violet
D) SO_4^{2-}	s) gives a white precipitate with a $BaCl_2$ solution

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3. Match the following

List - A	List - B
A) Red vapours	p) $MnSO_4 + NaBiO_3 + \text{conc. } HNO_3$
B) NaOH solution is turned yellow by the vapours	q) CrO_2Cl_2
C) Purple solution	r) KBr heated with MnO_2 and conc. H_2SO_4
D) A colourless solution results when the evolved gas is absorbed in an NaOH solution	s) $\{Fe(CN)_5\ NOS\}^{4-}$

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Practice Sheet 4 Integer Answer Type Questions

1. How many of the following cations belongs to group IIA in qualitative salt analysis

$Sn^{2+}, Hg_2^{+2}, Pb^{+2}, Zn^{2+}, Cu^{+2}, Cr^{+3}, As^{+3}, Mg^{+2}, Sb^{+3}$

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2. In the following how many cations are belongs to V group in qualitative salt analysis $Ba^{+2}, Mg^{+2}, Pb^{+2}, Cu^{+2}, Sr^{+2}, Sn^{+2}Ca^{+2}$

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3. In the following how many cations are forms hydroxide as precipitates in qualitative analysis $Cr^{+3}, Ni^{+2}, Ba^{+2}, Pb^{+2}, Ag^{+}, Hg_2^{+2}$

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4. In the following how many cations are forms carbonate as precipitates in qualitative analysis $Sr^{+2}, Ni^{+2}, Cr^{+3}, Zn^{+2}, Mn^{+2}. Co^{+2}, Al^{+3}$

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5. The qualitative analysis to the salt solution addition of reagents $NH_4CI + NH_4OH$ and ammonium carbonate give precipitate in precipitate the oxidation state of anion (only magnitude)

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6. 0.38 gm of a silver salt of a dibasic acid on ignition gave 0.27 gm of silver. Molecular mass of acid is $x \times 10$ gm then x value is

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Practice Sheet 5 Single Answer Questions

1. The catalyst used in Kjeldahl's method for the estimation of nitrogen is:

A. Copper

B. Magnesium

C. Mercury

D. Sodium

Answer: C

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2. In organic layer test, CS_2 or CCI_4 is added to Lassaigne's extract and then Cl_2 water or $KMnO_4$ is added. This test is used to distinguish between

A. Br^- and I^-

B. Cl^- and Br^-

C. Cl^- and I^-

D. Cl^-, Br^- and I^-

Answer: A

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3. n-Butane (C_4H_{10}) is produced by monobromination of C_2H_5 followed by Wurtz reaction. Calculate the volume of ethane al S.T.P. required to produce 55gin of n-butane. The bromination takes place with 90% yield and the Wurtz reaction with 85% yield

A. 27.75 litres

B. 55.5 litres

C. 111 litres

D. 5.55 litres

Answer: B

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4. A certain compound has the molecular formula X_4O_6 If 10 gm of X_4O_6 has 5.72 gm X, the atomic mass of X is:

A. 32 amu

B. 37 amu

C. 42 amu

D. 98 amu

Answer: A

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5. 0.5 gm of an organic substance containing phosphorous was heated with conc. HNO_3 in the Carius tube. The phosphoric acid thus formed was precipitated with magnesia mixture ($MgNH_4PO_4$) which on ignition gave a residue of 1.0 gm of magnesium pyrophosphate ($Mg_2P_2O_7$). The percentage of phosphorous in the organic compound is :

A. 0.5585

B. 0.2972

C. 0.1918

D. 0.205

Answer: A

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6. In the estimation of nitrogen by Kjeldahl's method, 2.8 gm of an organic compound required 20 millimole of H_2SO_4 for the complete neutralization of NH_3 gas evolved. The percentage of nitrogen in the sample is:

A. 0.2

B. 0.1

C. 0.4

D. 0.3

Answer: A

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7. The weight of 1 litre of ozonised oxygen at STP was found to be 1.5gm. When 100 ml of this mixture at STP was treated with turpentine oil, the volume was reduced to 90 ml. The molecular weight of ozone is

A. 49

B. 47

C. 46

D. 47.9

Answer: C

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Practice Sheet 5 One Or More Than One Answer Questions

1. Which of the following statements is/are correct?

A. In Lassaigne's test for halogens, conc. HNO_3 is used to remove HCN and H_2S

B. When an organic compound is heated with dry CuO and the gases evolved are passed through lime water which turns milky, the gas may be CO_2 or SO_2

C. In Carius method, sulphur is oxidised to SO_4^{2-} ion with fuming HNO_3

D. In Lassaigne's test, N present in the organic compound is converted into CN-'' ions

Answer: A::B::C::D

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2. Which of the following statements is/are correct?

A. The gas displaced in Victor Meyer's method in air

B. The simplest formula that shows the ratio of the atoms of various clements present in the molecule is called the molecular formula

C. Estimation of oxygen in an organic compound is also made by Aluise's method

D. An organic monoacidic base B on reaction with H_2PtCI_6 forms an insoluble compound $B_2H_2PtCI_6$

Answer: A::C::D

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3. Which of the following statements is/are correct?

A. Liebig's method is used for the quantitative estimation of both C and H

B. Dumas method is used for the quantitative estimation of N in all nitrogen-containing organic compounds

C. In Liebig's combustion method, ordinary CuO is used

D. Silver salt method is a chemical method for the determination of equivalent mass of organic acids

Answer: A::B::D

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4. Which of the following statements is/are wrong?

A. Aluminium wire is used in Beilstein test

B. Nitrogen gas is quantitatively estimated in Dumas method

C. In Kjeldahl's method, organic compound is reacted with conc. H_2SO_4, K_2SO_4 and Na_2SO_4 are also added

D. All organic compounds contain both C and H

Answer: A::C::D

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5. Which of the following statements is/are correct?

A. Molecular formula or molecular mass of a gaseous hydrocarbon can be determined even without knowing their percentage composition by eudiometry

B. In Lassaigne's test, N and S both present in the organic compound are converted into CNS ion

C. K_2SO_4 and $CuSO_4$ are added in Kjeldahl's method. K_2SO_4 acts as a catalyst while $CuSO_4$ raises the boiling point of H_2SO_4

D. Layer test is used to distinguish $Cl\cdot$ " and" Br^- ions

Answer: A::B

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6. Which of the following statements is/are correct?

A. Nitroprusside ion is $\left[Fe(CN)_5\right]^{2+}$

B. Nitroprusside ion is $\left[Fe(CN)_5NOS\right]^{2+}$

C. Prussian blue and Turnbull's blue, respectively, are $Fe_4\left[Fe(CN)_6\right]_3$ and $Fe_3\left[Fe(CN)_6\right]_2$

D. Prussian blue and Turnbull's blue, respectively, are $Fe_3\left[Fe(CN)_6\right]_2$ and $Fe_4\left[Fe(CN)_6\right]_3$

Answer: A::C

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7. Which of the following statements is/are wrong?

A. Beilstein test is reliable test for halogens in organic compounds

B. In Lassaigne's test for N, Prussian blue colour is due to the formation of ferro-ferri cyanide

C. When FeCl3 solution is added to the Lassaigne's extract, ablue solution is obtained, which indicates the presence of both N and S

D. Molecular mass of an acid = $\text{Equivalent mass} \times \text{acidity}$

Answer: A::B::C

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8. Which of the following statements is/are wrong?

A. Sulphur is estimated by Carius method as $BaSO_4$

B. Victor Meyer's method is used for the determination of molecular mass of a non-volatile compound

C. Kjeldahl's method is used for all nitrogen-containing organic compounds

D. Phosphorous is estimated by Carius method as $Mg(NH_4).PO_4$

Answer: C::D

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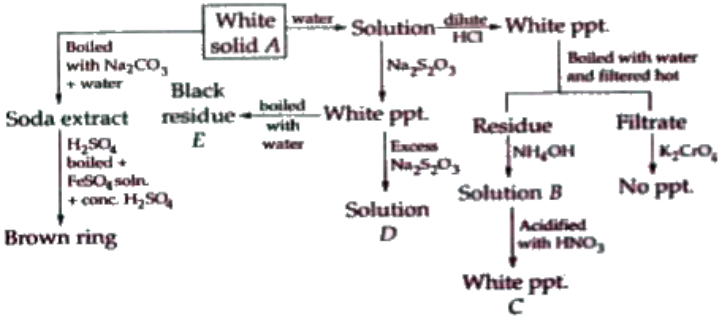
Practice Sheet 5 Linked Comprehension Type Questions

1. Consider the following sequence of reactions.



The white solid A is a

A. 1. chloride

B. 2. nitrate

C. 3. nitrite

D. d. bromide

Answer: B

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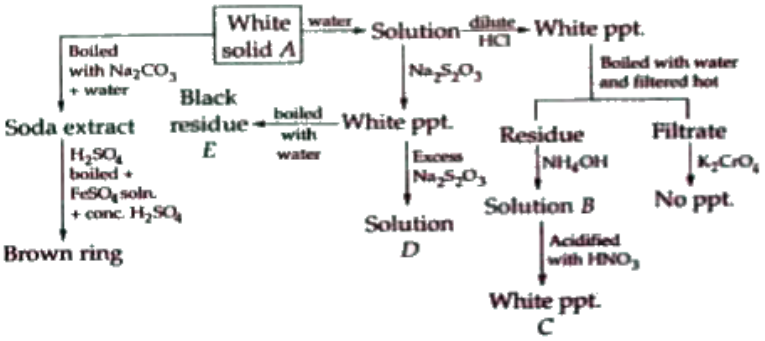
2. Consider the following sequence of reactions.



The change from B to C involves the reaction

A. $\left[Hg(NH_3)_4\right]^2 + 2H^+ + Cr^- \rightarrow Hg(NH_2)CI \downarrow + 3NH_4^+$

B. $\left[Pb(NH_3)_4\right]^{2+} + 4H^+ + 2C^- \rightarrow PbCl_2 \downarrow + 4NH_4^+$

C. $\left[Pb(OH)_4\right]^{2-} + 4H^+ + 2C^- \rightarrow PbCl_2 + 4H_2O$

D. $\left[Ag(NH_3)_2\right]^{2+} + 2H^+ + Cl^- \rightarrow AgCl \downarrow + 2NH_4^+$

Answer: D

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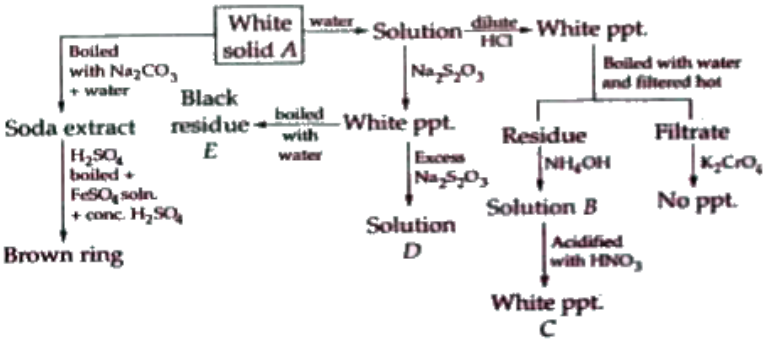
3. Consider the following sequence of reactions.



The solution D and the residue E respectively contain

A. Hg_2, S_2O_3 and Hg_2S

B. PbS_2O_3 and PbS

C. $\left[Ag(SO_2O_3)_2\right]^{3-}$ and Ag_2S

D. none of these

Answer: C

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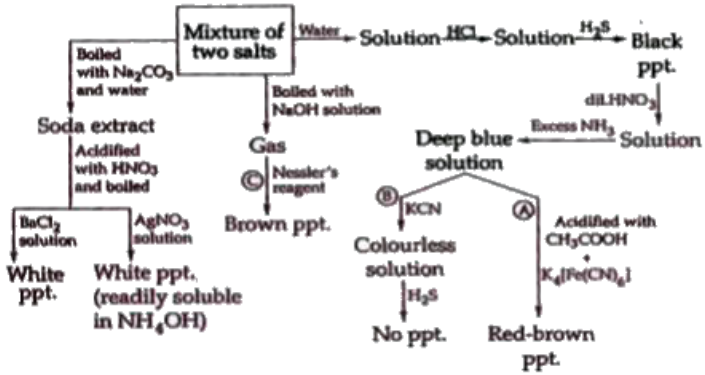

4.

The red-brown precipitate formed in step A contains

A. $Hg_2\left[Fe(CN)_6\right.$

B. $Cd_2\left[Fe(CN)_6\right]$

C. $Cu_2\left[Fe(CN)_6\right]$

D. $Pb_2\left[Fe(CN)_6\right]$

Answer: C

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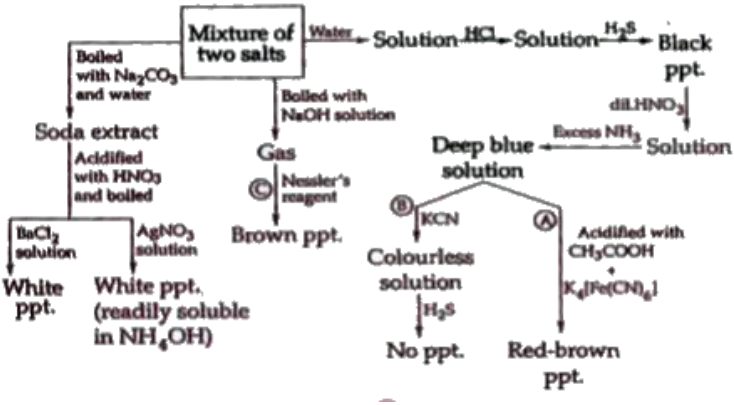

5.

The colourless solution formed in step B contains

A. $\left[Hg(CN)_4\right]^{2-}$

B. $\left[Cd(CN)_4\right]^{2-}$

C. $\left[Cu(CN)_4\right]^{2-}$

D. $\left[Cu(CN)_4\right]^{3-}$

Answer: D

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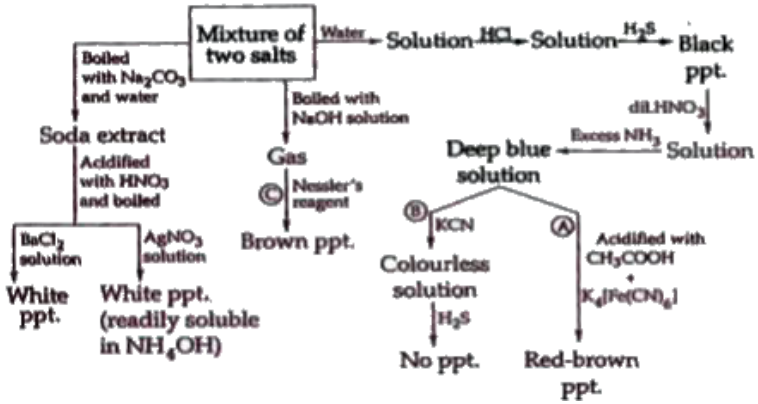

6.

The brown precipitate formed in step C consists of

A. $Hg(NH_2I$

B. $Hg(NH_2)NO_3$

C. $HgO, Hg(NH_{2II})I$

D. Ag_2O

Answer: C

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Practice Sheet 5 Match The Following Questions

1. Match the following

List – A	List – B
A) Soluble in a concentrated NH_3 solution	p) $Fe_4[Fe(CN)_6]_3$
B) Prussian blue	q) $Cu(OH)_2$
C) Dissolves in a concentrated NH_3 solution and gets reprecipitated when the ammoniacal solution is acidified with HNO_3	r) AgBr
D) Dissolves in NH_3 and the ammoniacal solution on acidification with acetic acid and treatment with $K_4[Fe(CN)_6]$ gives a chocolate coloured precipitate	s) AgCl

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2. Match the following

List – A	List – B
A) Colourless solution	p) $Ni(dmg)_2$
B) Bead test	q) $Fe(SCN)_3$
C) Blue	r) $Co(BO_2)_2$
D) Red	s) $[Cu(CN)_4]^{3-}$

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3. Match the following

List – A	List – B
A) Blue, soluble in amyl alcohol	p) $(NH_4)_2$ [Co(SCN)$_4$]
B) White	q) ZnS
C) Obtained in the analysis of group IIIB cations	r) $PbSO_4$
D) Soluble in an ammonium acetate solution	s) CrO_5

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Practice Sheet 5 Integer Answer Type Questions

1. 1.575 gm of organic acid was dissolved in 250ml of water 20ml of this solution required 16 ml of $N/8$ alkali solution for completely neutralization. (M. wt of acid is 126) the basicity of acid is

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2. 0.188gm of silver bromide is obtained from x gm of an organic compound and percentage of bromine in the compound is 4. Then the x

value is

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3. 0.76gm of the silver salt of a diabasic acid was ignited. It gave 0.54gm of pure silver. The molecular mass of acid is ..... x10.

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4. A sample of 0.50 g of an organic compound was treated according to Kjeldahl's method. The ammonia evolved was absorbed in 50 ml of $0.5MH_2SO_4$. The residual acid required 60 mL of 0.5 M solution of NaOH for neutralisation. Find the percentage composition of nitrogen in the compound.

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5. 0.16 gm of organic acid required 25 ml of $\frac{N}{10}$ NaOH for complete neutralization. (M. wt of acids is 128). Then the basicity of acid is

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6. How many of the following carbons belongs to IIA, III, IV and V only in qualitative salt analysis

$Hg_2^{2+}, As^{+3}, Zn^{+2}, Mg^{+2}, NH_4^+, Sr^{+2}, Pb^{+2}, Ni^{+2}$

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