CHEMISTRY

AAKASH INSTITUTE ENGLISH

PRINCIPLES OF QUALITATIVE ANALYSIS

Example

1. Calculate the oxidation no. of

(i) CO_3^{-2} and SO_3^{-2}

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2. Complete the following reaction.

(i) $CaCO_3 \xrightarrow{\Delta} [A] + \underset{\text{gas}}{[B]}$

(ii) $[A] + H_2O \rightarrow [C]$

(iii) $[C] + [B] \rightarrow CaCO_3 + H_2O$

(iv) $NH_4Cl + [C] \xrightarrow{\Delta} \underset{\text{gas}}{[E]} + CaCl_2 + H_2O$

(v) $E + H_2O + [B] \rightarrow [F]$

(vi) $NaCl + [F] \rightarrow [G] + NH_4Cl$

(vii) $[G] \xrightarrow{\Delta} Na_2CO_3 + H_2O + [B]$

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3. Concentrated HCl cannot be used as group reagent in first group precipitation. Why ?

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4. How does aqua-regia act on dissolving black HgS?

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5. Explain why in the precipitation of group I cations as chlorides, it is preferable to add a slightly more quantity of dil HCl than required.

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6. A colourless water soluble solid (X) on heating gives equimolar quantities of (Y) and (Z). Y gives dense white fumes with HCl and Z does so with NH_3. Y gives brown ppt. with K_2Hgl_4 (Nesslers reagent) and Z gives white precipitate with nitrates of Ag^+, Pb^{2+} and Hg^+. What is X ?

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7. A certain compound (A) is used in the laboratory for analysis, its aqueous solution gives the following reactions:

a. On addition to copper sulphate, a brown precipitate is obtained which turns white on addition of excess of the $Na_2S_2O_3$ solution.

b. On addition to the $Ag^{\oplus}$ ion solution, a yellow curdy precipitate is

obtained which is insoluble in ammonium hydroxide. Identify (A) and give equations for the reactions at steps (a) and (b).

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8. A compound (A) when treated with Kl gives a Scarlet red ppt. (B) which dissolves in excess of Kl. This solution is made alkaline with NaOH and gave brown precipitate (C) when NH_3 gas is passed through it. When (A) is added with small amount of $SnCl_2$ it gives a white ppt (D) but gives grey precipitate with excess amount of $SnCl_2$. When H_2S gas is passed through an acidic solution of (A) a black precipitate (E) is obtained. Identify (A) to (E). Write the reactions involved.

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Try Yourself

1. If in solution containing $Cl^- \& Br^-$ ions, $AgNO_3$ is added then initial precipitate of which colour will be formed ?

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2. Calculate the oxidation no. of Sb in $SbCl_3$ and Bi in $BiCl_3$.

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Assignment Section A

1. Which among the following sulphates is insoluble in water ?

A. $CuSO_4$

B. $CdSO_4$

C. $PbSO_4$

D. $Bi_2(SO_4)_3$

Answer: C

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2. Which of the following will not give positive chromyl chloride test?

A. $CuCl_2$

B. $HgCl_2$

C. $ZnCl_2$

D. $C_6H_5NH_3^+Cl^-$

Answer: B

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3. $PbCl_2 + Kl \rightarrow \underset{\text{Yellow ppt}}{[A]} + KCl$

$\underset{\text{Yellow ppt}}{[A]} + \underset{\text{excess}}{Kl} \rightarrow \underset{\text{Soluble}}{[B]}$

Compound [A] and [B] are

A. Pbl_4 and $K_2[Pbl_4]$ respectively

B. $K_2[Pbl_4]$ and Pbl_4 respectively

C. Pbl_2 and $K_2[Pbl_4]$ respectively

D. Pbl_2 and $K_2[Pbl_2]$ respectively

Answer: C

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4. The reagents, NH_4Cl and aqueous NH_3 will precipitate

A. Ca^{2+}

B. Al^{3+}

C. Mg^{2+}

D. Zn^{2+}

Answer: B

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5. Mark the correct statement out of the following

A. Group I basic radicals precipitate as chlorides

B. Group IV basic radicals precipitate as sulphides

C. Group V basic radicals precipitate as carbonates

D. All of the above statements are correct

Answer: D

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6. Which of the following is not a prelminary test used to detect ions?

A. Borax bead test

B. Flame test

C. Brown ring test

D. Microcosmic salt bead test

Answer: C

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7. Which compound does not dissolve in hot dilute HNO_3 ?

A. HgS

B. CuS

C. PbS

D. CdS

Answer: A

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8. When $K_2Cr_2O_7$ crystals are heated with conc. HCl, the gas evolved is

A. O_2

B. Cl_2

C. CrO_2Cl_2

D. HCl

Answer: B

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9. The only cations present in a slightly acidic solution are Fe^{3+}, Zn^{2+} and Cu^{2+}. The regent that when added in excess to this solution would identify and separate 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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10. The brown ring test for NO_3^- is due to the formation of the complex ion with formula

A. $\left[Fe(H_2O)_6\right]^{2+}$

B. $\left[Fe\left(NO(CN)_5\right]^{2-}\right.$

C. $\left[Fe(H_2O)_5NO\right]^{2+}$

D. $\left[Fe(H_2O)(NO)_5\right]^{2+}$

Answer: C

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11. A salt which gives CO_2 with hot H_2SO_4 and also decolourizes acidified $KMnO_4$ on warming is

A. HCO_3^-

B. CO_3^{2-}

C. Oxalate ion

D. Acetate ion

Answer: C

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12. An aqueous solution $FeSO_4$. $Al_2(SO_4)_3$ and chrome alum is heated with excess of Na_2O_2 and filtered. The materials obtained are

A. A colourless filtrate and a green residue

B. A yellow filtrate and a green residue

C. A yellow filtrate and a brown residue

D. A green filtrate and a brown residue

Answer: C

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13. When conc. H_2SO_4 is added to dry KNO_3 brown fumes evolve. These fumes are of

A. SO_2

B. SO_3

C. NO

D. NO_2

Answer: D

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14. In the fifth group, $(NH_4)_2CO_3$ is added to precipitate out the carbonates, we do not add Na_2CO_3 because

A. $MgCO_3$ is soluble in Na_2CO_3

B. Na_2CO_3 increases the solubility of fifth group carbonates

C. $MgCO_3$ will also be precipitated out in fifth group

D. Na_2CO_3 will decrease the solubility product of $MgCO_3$

Answer: C

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15. White substance dissolves in hot water. A black precipitate appears on passing H_2S gas in its aqueous solution. The black precipitate dissolves in hot HNO_3. A white precipitate is obtained on adding concentrated H_2SO_4 in its solution. This white precipitate is of

A. $BaSO_4$

B. $SrSO_4$

C. $PbSO_4$

D. $CdSO_4$

Answer: C

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16. A salt on treatment with dil. HCl gives a pungent smelling gas and a yellow precipitate. The salt gives green flame when tested. The solution gives a yellow ppt. with potassium chromate. The salt is

A. $NiSO_4$

B. BaS_2O_3

C. PbS_2O_3

D. $CuSO_4$

Answer: B

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17. A violet colour is obtained on adding Cl_2 water in solution of potassium halide in presence of chloroform and on adding excess of Cl_2 water, violet colour disappears and colourless solution appears. The test shows the presence of

A. Iodide ion

B. Bromide ion

C. Chloride ion

D. Iodide and bromide ion

Answer: A

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18. A substance on treatment with dilute H_2SO_4 liberates a colourless gas which produces (I) turbidity with baryta water and (ii) turns acidified dichromate solution green. The reaction indicates the presence of :

A. $C_2O_3^{2-}$

B. S^{2-}

C. SO_3^{2-}

D. NO_2^-

Answer: C

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19. Which of the following statement is correct?

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

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

C. Fe^{3+} gives brwon colour with potassium ferrocyanide

D. Fe^{3+} gives red colour with potassium ferrocyanide

Answer: B

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20. When H_2S gas a passed through an ammonical salt solution X, a slightly white precipitate is formed. The X can be:

A. Cobalt salt

B. Nickel salt

C. Manganese salt

D. Zinc salt

Answer: D

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21. A mixture is known to contain NO_3^- and NO_2^- before performing ring test for NO_3^-. The aq. Solution should be made free of NO_2^-. This is done by heating with

A. $CO(NH_2)_2$

B. Zn dust

C. Conc. HNO_3

D. dil. HNO_3

Answer: A

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22. The ion most difficult to removes as precipitate is

A. Ag^+

B. NH_4^+

C. Fe^{+2}

D. Co^{+2}

Answer: B

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23. Which of the following white ppts are insoluble in NH_3?

A. $AgCl$

B. Hg_2Cl_2

C. $PbCl_2$

D. All of these

Answer: C

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24. The brown ring complex compound is formulated as $\left[Fe(H_2O)_5NO\right]SO_4$. The oxidation state of Fe is

A. $+1$

B. $+2$

C. $+3$

D. $+4$

Answer: A

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25. Choose the correct pair regarding solubility

A. $CuS < MnS$

B. $CoS > ZnS$

C. $CdS > NiS$

D. $CuS > ZnS$

Answer: A

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Assignment Section B

1. Which of the following salts will not give borax bead test ?

A. $Al(NO_3)_3$

B. $CoCl_2$

C. CoC_2O_4

D. $K_2C_2O_4$

Answer: A::D

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2. Which of the following sulphates are soluble in water?

A. $CuSO_4$

B. $PbSO_4$

C. Ag_2SO_4

D. $BaSO_4$

Answer: A::C

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3. An aqueous solution containing S^{-2} ions will not give

A. A yellow precipitate with the suspension of $CdCO_3$ in water

B. Black precipitate with lead acetate solution

C. White precipitate with $CaCO_3$ suspension

D. Purple colour with sodium thiosulphate solution

Answer: C::D

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4. Hydrogen sulphide is not a group reagent for (basic radical)

A. 2^{nd} group radicals

B. 3^{rd} group radicals

C. 4^{th} group radicals

D. 5^{th} group radicals

Answer: B::D

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5. Which of the following radicals evolve gas or vapour when treated with dil HCl?

A. (a) SO_3^{2-}

B. (b) $C_2O_4^{2-}$

C. (c) CH_3COO^-

D. (d) HCO_3^-

Answer: A::C::D

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6. To the aqueous solution of the salt acidified potassium permanganate is added and its colour is discharged. It indicates the absence of

A. Fe^{+2}

B. NO_3^-

C. Be^{+2}

D. Sn^{+2}

Answer: B::C

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7. Which among the following will be soluble in excess of $NaOH$?

A. $FeCl_3$

B. $CrCl_3$

C. $AlCl_3$

D. $ZnCl_2$

Answer: C::D

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8. Which of the following compound will not turn black on adding NH_4OH to it ?

A. $ZnSO_4$

B. Hg_2Cl_2

C. $AgCl$

D. $CuSO_4$

Answer: A::C::D

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9. Which pair of compounds is expected to show similar colour in aqueous medium?

A. $FeCl_2$ and $CuCl_2$

B. $VOCl_2$ and $CuCl_2$

C. $VOCl_2$ and $FeCl_2$

D. $FeCl_2$ and $MnCl_2$

Answer: A

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10. Brown vapours can be of

A. Cl_2

B. l_2

C. Br_2

D. NO_2

Answer: C::D

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11. If silver nitrate solution is added to a salt solution and a yellow precipitate is obtained the salt may contain

A. Br^-

B. l^-

C. Cl^-

D. F^-

Answer: A::B

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12. Which of the following sulphides are yellow ?

A. CdS

B. As_2S_3

C. SnS_2

D. ZnS

Answer: A::B::C

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13. To an acidic solution of an anion, a few drops of $Kmno_4$ solution are added. Which of the following, if present, will not decolourise the $KMnO_4$ solution?

A. NO_2^-

B. S^{2-}

C. CO_3^-

D. Cl^-

Answer: A::B::D

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14. If $Pb[CH_3COO]_2$ and Na_2S are mixed and dissolved in water and the solution is filtered then the filterate will give test of

A. Pb^{+2}

B. CH_3COO^-

C. S^{-2}

D. Na^+

Answer: B::D

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15. A solution of salt in HCl when diluted with excess of water turns milky. It indicates the presence of

A. Al

B. Bi

C. Sb

D. Zn

Answer: B::C

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Assignment Section C

1. $FeCl_3$ is acidic towards litmus. On treatment with excess of NH_4SCN it gives red coloured compound (A) and on treatment with excess of $K_2Cr_2O_7$ in the presence of conc. H_2SO_4, it evolves deep red vapours of (B) on passing the vapours of (B) into $NaOH$, then adding a solution of acetic acid and lead acetate it gives yellow ppt. of compound of chromium (C)

What is the hybridisation of chromium in compound (C) ?

A. sp^3d

B. sp^3

C. dsp^2

D. sp^2

Answer: B

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2. $FeCl_3$ is acidic towards litmus. On treatment with excess of NH_4SCN it gives red coloured compound (A) and on treatment with excess of $K_2Cr_2O_7$ in the presence of conc. H_2SO_4, it evolves deep red vapours of (B) on passing the vapours of (B) into $NaOH$, then adding a solution of acetic acid and lead acetate it gives yellow ppt. of compound of chromium (C)

The compound B is

A. NO_2

B. Br_2

C. CrO_2Cl_2

D. $CrOCl_4$

Answer: C

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3. $FeCl_3$ is acidic towards litmus. On treatment with excess of NH_4SCN it gives red coloured compound (A) and on treatment with excess of $K_2Cr_2O_7$ in the presence of conc. H_2SO_4, it evolves deep red vapours of (B) on passing the vapours of (B) into $NaOH$, then adding a solution of acetic acid and lead acetate it gives yellow ppt. of compound of chromium (C)

The compound A is

A. $Fe(SCN)_2$

B. $Fe(SCN)_3$

C. $FeCl_3$

D. $NH_4[Fe(CN)_4]$

Answer: B

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4. Borax $[Na_2B_4O_7.10H_2O]$ when heated on platinum loop it gives a dark transparent glass like bead. The hot bead is dipped in the salt till it reacts with transition metal oxide. It produces characteristic bead of meta borate.

Colour of the bead	Ion
(a) Blue green or light blue	Cu^{+2}
(b) Yellow	Fe^{+2} or Fe^{+3}
(c) Green	Cr^{+3}
(d) Violet	Mn^{+2}
(e) Dark blue	Co^{+2}
(f) Brown	Ni^{+2}

The hybridisation of B in Borax is

A. sp^2

B. sp^3

C. Both (1) & (2)

D. sp

Answer: C

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5. Borax $[Na_2B_4O_7.10H_2O]$ when heated on platinum loop it gives a dark transparent glass like bead. The hot bead is dipped in the salt till it reacts with transition metal oxide. It produces characteristic bead of meta borate.

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(c) Green	Cr^{+3}
(d) Violet	Mn^{+2}
(e) Dark blue	Co^{+2}
(f) Brown	Ni^{+2}

Glassy bead is of

A. $B_2O_3 + NaBO_2$

B. Na_3BO_3

C. $Na_2B_4O_7$

D. SiO_2

Answer: A

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6. Borax $[Na_2B_4O_7.10H_2O]$ when heated on platinum loop it gives a dark transparent glass like bead. The hot bead is dipped in the salt till it reacts with transition metal oxide. It produces characteristic bead of meta borate.

Colour of the bead	Ion
(a) Blue green or light blue	Cu^{+2}
(b) Yellow	Fe^{+2} or Fe^{+3}
(c) Green	Cr^{+3}
(d) Violet	Mn^{+2}
(e) Dark blue	Co^{+2}
(f) Brown	Ni^{+2}

The colour of bead $Ni(BO_2)_2$ is

A. Green

B. Brown

C. Violet

D. Blue

Answer: B

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7. Borax $[Na_2B_4O_7.10H_2O]$ when heated on platinum loop it gives a dark transparent glass like bead. The hot bead is dipped in the salt till it reacts with transition metal oxide. It produces characteristic bead of meta borate.

Colour of the bead	Ion
(a) Blue green or light blue	Cu^{+2}
(b) Yellow	Fe^{+2} or Fe^{+3}
(c) Green	Cr^{+3}
(d) Violet	Mn^{+2}
(e) Dark blue	Co^{+2}
(f) Brown	Ni^{+2}

The flame used in Borax Bead test is

A. Reducing

B. Oxidising

C. Both (1) & (2)

D. Neither (1) nor (2)

Answer: C

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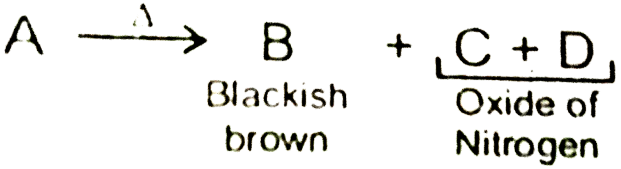

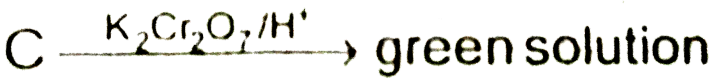

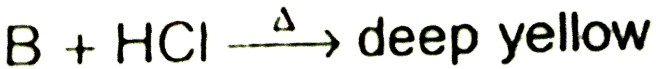

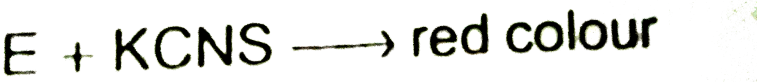

8.

The compound A may be

A. $FeSO_4$

B. $CoSO_4$

C. $MnSO_4$

D. $Na_2S_2O_7$

Answer: A

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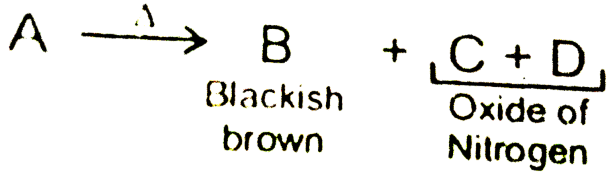

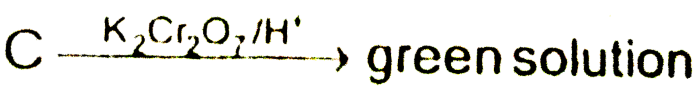

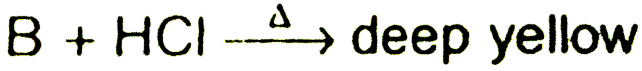

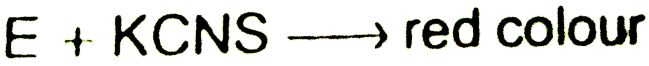

9.

The compound responsible for red colour is

A. $Fe(SCN)_3$

B. $Co(CNS)_6^{-4}$

C. $Mn(CNS)_6^{-4}$

D. $NaSCN$

Answer: A

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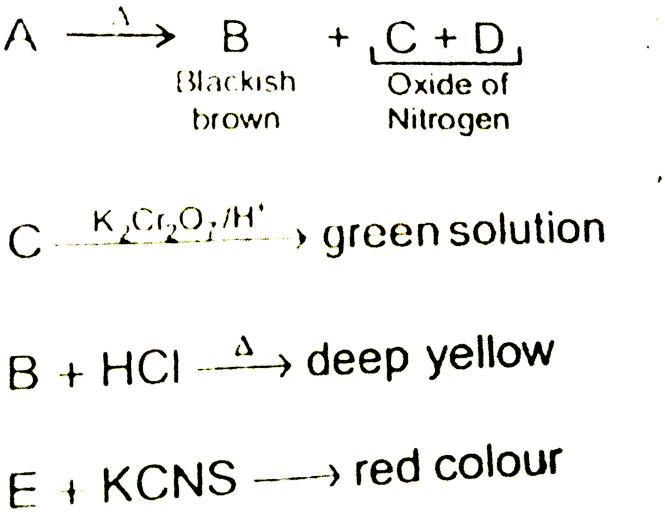
10.



The compound responsible for deep yellow colour is

A. $FeCl_3$

B. $CoCl_3$

C. $MnCl_2$

D. $NaCl$

Answer: A

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11. boiling points of noble gases increase from helium to Neon (T/F)

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12. Draw the Structure of BromoBenzene

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Assignment Section D

1. STATEMENT - 1 : SO_2 turns acidified $K_2Cr_2O_7$ green. And

STATEMENT - 2 : SO_2 converts $Cr_2O_7^{2-}$ ion to Cr^{+3} which gives green colour.

A. Statement-1 is True, Statement-2, is True, Statement-2 is a correct explanation for Statement-1

B. Statement-1 is True, Statement-2, is True, Statement-2 is NOT a correct explanation for Statement-1

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: A

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2. STATEMENT - 1 : A dark blue colour is obtained on adding excess of dilute NH_4OH solution in aqueous soluiton of copper sulphate.

and

STATEMENT - 2 : Dark blue colour is due to the formation of $\left[Cu(NH_3)_4\right]^{2+}$ complex ion.

A. Statement-1 is True, Statement-2, is True, Statement-2 is a correct explanation for Statement-2

B. Statement-1 is True, Statement-2, is True, Statement-2 is NOT a correct explanation for Statement-2

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: A

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3. STATEMENT - 1 : CdS and As_2S_3 are coloured compounds.

and

STATEMENT - 2 - : CdS and As_2S_3 can be separated by ammonium sulphide.

A. Statement-1 is True, Statement-2, is True, Statement-2 is a correct explanation for Statement-3

B. Statement-1 is True, Statement-2, is True, Statement-2 is NOT a correct explanation for Statement-3

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: B

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4. STATEMENT - 1 : A mixture of ZnO and CuO can be separated by boiling the mixture with $NaOH$ solution.

and

STATEMENT - 2 : ZnO dissolves in $NaOH$ solution while CuO remains undissolved.

A. Statement-1 is True, Statement-2, is True, Statement-2 is a correct explanation for Statement-1

B. Statement-1 is True, Statement-2, is True, Statement-2 is NOT a correct explanation for Statement-1

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: A

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5. STATEMENT - 1 : Co^{2+} gives green colour with Br_2 water in presence of $KHCO_3$

and

STATEMENT - 2 : Green colour is due to formation of $CoCO_3$.

A. Statement-1 is True, Statement-2, is True, Statement-2 is a correct explanation for Statement-5

B. Statement-1 is True, Statement-2, is True, Statement-2 is NOT a correct explanation for Statement-5

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: C

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6. STATEMENT - 1 : Moistened ammonium slats give the smell of NH_3.

and

STATEMENT - 2 : Ammonium salts give NH_3 on heating with conc. $NaOH$

A. Statement-1 is True, Statement-2, is True, Statement-2 is a correct explanation for Statement-6

B. Statement-1 is True, Statement-2, is True, Statement-2 is NOT a correct explanation for Statement-6

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: B

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7. STATEMENT - 1 : HCO_3^- and CO_3^{-2} both gives colourless gas on addition of dil. HCl.

STATEMENT - 2 : Both HCO_3^- and CO_3^{-2} gives with ppt with Mg^{+2}

A. Statement-1 is True, Statement-2, is True, Statement-2 is a correct explanation for Statement-7

B. Statement-1 is True, Statement-2, is True, Statement-2 is NOT a correct explanation for Statement-7

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: C

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8. STATEMENT - 1 : Fe^{+3} gives brown coloured ppt with $K_3[FeCN)_6]$.

and

STATEMENT - 2 : Formation of undissociated complex $Fe[Fe(CN)_6]$ take place.

A. Statement-1 is True, Statement-2, is True, Statement-2 is a correct explanation for Statement-1

B. Statement-1 is True, Statement-2, is True, Statement-2 is NOT a correct explanation for Statement-1

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: B

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9. STATEMENT - 1 : Cu^{+2} is unstable in presence of Cl^{-} ion.

and

STATEMENT - 2 : Formation of $CuCl$ is more favourable.

A. Statement-1 is True, Statement-2, is True, Statement-2 is a correct explanation for Statement-1

B. Statement-1 is True, Statement-2, is True, Statement-2 is NOT a correct explanation for Statement-1

C. Statement-1 is True, Statement-2 is False

D. Statement-1 is False, Statement-2 is True

Answer: B

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Assignment Section E

1. Match the Following :

	Column I (Addition of dil. HCl/dil H_2SO_4)		Column II (Observation)
(A)	$S_2O_3^{2-}$	(p)	Gas evolved turns lime wat
(B)	SO_3^{2-}	(q)	Gas turns lead acetate pape
(C)	CO_3^{2-}	(r)	Gas turns acidified K_2Cr_2
(D)	S^{2-}	(s)	Gives white turbidity

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2. Match the Following :

	Column I		Column II
(A)	Borax $\xrightarrow{\Delta}$.	(p)	Inorganic benzene
(B)	Borax $+NH_4Cl \xrightarrow{\Delta}$	(q)	$NaBO_2 + B_2O_3$
(C)	Borax $+NH_3 \xrightarrow{\Delta}$	(r)	$(BN)_x$
(D)	Borax $+H_2O \rightarrow$	(s)	H_3BO_3

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3. Match the following :

Column I		Column II
(A) Chromyl chloride test	(p)	S^{2-}
(B) Ring test	(q)	NO_3^-
(C) Smell of vinegar	(r)	CH_3COO^-
(D) Smell of rotten eggs	(s)	Cl^-

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4. Na_2CrO_4 on treatment with lead acetate gives a precipitate. This dried precipitate is used as a pigment for road signs and markings . The solid is known as:

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5. Match the following

Column I	Column II
(A) $FeSO_4 \xrightarrow{\Delta}$	(p) A gas which gives green colour
(B) $NaNO_2 \xrightarrow{dil\,HCl} A \xrightarrow{air} B$ (gas)	(q) A gas which form oleum with
(C) $Na_2SO_3 \xrightarrow{dil\,(HCl)} P$ (gas)	(r) A gas which is mixed anhydride
(D) $NaCl \xrightarrow{conc.\,H_2SO_4} P$ (gas)	(s) A gas which is also given by
	(t) Green colour

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Assignment Section F

1. How many moles of KCN are required to convert 1 mole of $CuSO_4$ to $\left[Cu(CN)_4\right]^{-3}$?

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2. The oxidation state of Fe in brown complex $\left[Fe(H_2O)_5NO\right]SO_4$ is

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3. A metal ion give chocolate coloured ppt with $K_4\left[Fe(CN)_6\right]$

What is the oxidation state of that metal in its ion ?

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4. Oxidation number of Fe in violet coloured complex $Na_4\left[Fe(CN)_5(NOS)\right]$ is :

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5. How many cations are placed in 6^{th} group?

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6. The pH of a 10^{-10} molar HCl solution is approximately

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Assignment Section G

1. STATEMENT - 1 : $NaNO_2$ on treatment with dil. HCl gives brown coloured gas directly.

STATEMENT -- 2 : $\left[Fe(CN)_5NO\right]^{-2}$ is used for the detection of of S^{-2}.

STATEMENT - 3 : Precipitate of AgI are of yellow colour

A. FTF

B. FTT

C. TTF

D. TTT

Answer: B

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2. STATEMENT - 1 : H_2S in acidic medium is the group reagent for II^{nd} group in basic radical.

STATEMENT - 2 : K_{sp} of suphides of II^{nd} group ions is less.

STATEMENT - 3 : All sulphides of II^{nd} group element are coloured.

A. FTF

B. TTT

C. FFF

D. TTF

Answer: B

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3. STATEMENT - 1 : solubility of sulphide is higher in acidic medium than pure water.

STATEMENT - 2 : Aq. Solution of metal sulphides is neutral.

STATEMENT - 3 : Metal sulphides are salt of strong base and weak acid.

A. TFF

B. FTT

C. TFT

D. TTF

Answer: A

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4. STATEMENT - 1 : All Pb^{+2} form white ppt with dil. HCl in estimation.

STATEMENT - 2 : Al^{+3} form white ppt with $NH_4OH\,/\,NH_4Cl$.

STATEMENT - 3 : $Fe(OH)_3$ is soluble in excess $NaOH$.

A. TTF

B. TTT

C. FTT

D. FTF

Answer: C

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5. STATEMENT - 1 : $NaNO_2$ and $NaNO_3$ gives brown ring test.

STATEMENT - 2 : Both gives blue coloured gas with conc. H_2SO_4.

STATEMENT - 3 : NO_3^- gives ammonia with $NaOH$ in presence of Cu.

A. TFT

B. TTT

C. FTF

D. TTF

Answer: B

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Assignment Section H

1. When a white powder (A) is strongly heated, it gives of a colourless, odourless gas (B) which turns lime water milky (C) and if the passage of this gas is continued the milkiness disappears and gives a solution (D). The solid residue (E) is yellow when hot, but turns white on cooling. Idnetify (A) to (E) with help of the equations.

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2. A solid laboratory reagent (A) give following reactions.

(i) It impart green colour of flame :

(ii) Its solution does not give ppt. on passong H_2S.

(iii) When it is heated with $K_2Cr_2O_7$ and conc. H_2SO_4, a red gas (B) is evolved. The gas when passed in aq. NaOH solution turns it yellow (C). Identify (A), (B), (C) giving chemical reactions.

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3. An aqueous of a gas (X) shows the following reactions :

(a) It turns red litmus blue.

(b) When added in excess to a copper sulphate solution, a deep blue coloured solution is obtained.

(c) On addition to $FeCl_3$ solution, a brownish precipitate is formed, which is solution in HNO_3.

Identify (X) and give an explanation for step (a), (b) and (c).

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4. A black mineral (A) on heating in presence of air gives a gas (B). The mineral (A) on reaction with dilute H_2SO_4 gives a gas (C) and a solution of a compound (D) on passing the gas (C) into an aqueous solution of (B), a white turbidity is obtained. The aqueous solution of (D) on reaction with potassium ferricyanide gives a blue compound (E). Identify (A) to (E) and give chemical equations for the reaction involved.

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5. When gas A is passed through dry KOH at low temperature, a deep red coloured compound, B and a gas care obtained. The gas A, on reaction with but-2-ene, followed by treatment with Zn/H_2O yields acetaldehyde. Identify A, B and C.

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6. The gas liberated on heating a mixture of two salts with $NaOH$, gives a reddish brown precipitate with an alkaline solution of K_2Hgl_4. The aqueous solution of the mixture on treatment with $BaCl_2$ gives a white precipitate which is sparingly soluble in conc. HCl. On heating the mixture of $K_2Cr_2O_7$ and conc H_2SO_4 red vapours (A) are produced. The aqueous solution of the mixture gives a deep blue colouration (B) with potassium ferricyanide solution. Idnetify the radicals in the given mixture and write the balanced equations for the formation of (A) and (B).

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7. A certain salt (X) gives the following tests :

(a) Its aqueous solution is alkaline to litmus.

(b) On strong heating, it swells up to give a glassy material (Y).

(c) When conc. H_2SO_4 is added to a hot concentrated solution of (X), white crystal of a weak acid (Z) separates out.

Identify $(X), (Y)$ and (Z) and write down the chemical equations for reaction at steps a, b and c.

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8. An unknown inorganic compound (X) loses it water of crystallisation on heating and its aqueous solution gives the following reaction.

(i) It gives a white turbidity with dilute hydrochloric acid solution.

(ii) It decolourises a solution of iodine in potassium iodide.

(iii) It gives a white precipitate with silver nitrate solution which turns black on standing. Identify the compound (X) and give chemical equations for the reaction at step (i) to (iii).

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9. A compound (X) on heating with an excess of NaOH solution gives a gas (Y) which gives white fumes on exposure to HCl. Heating is continued to expel the gas completely. The resultant alkaline solution again liberates the same gas (Y) when heated with Zn powder. However, when the compound (X) is heated alone does not give nitrogen. Identify (X) and (Y).

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