

Engineering Chemistry-II

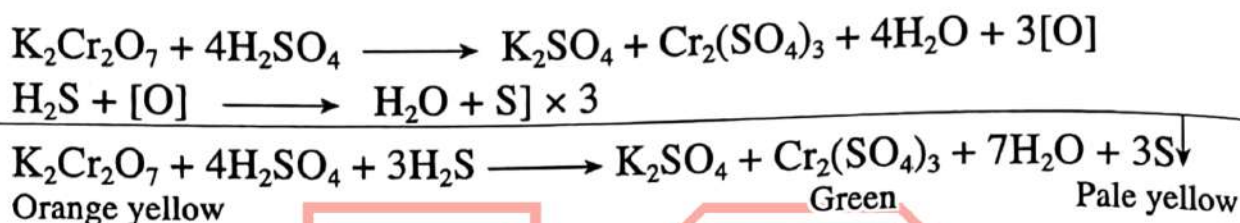
SOME IMPORTANT QUESTIONS WITH SOLUTIONS

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What happens when

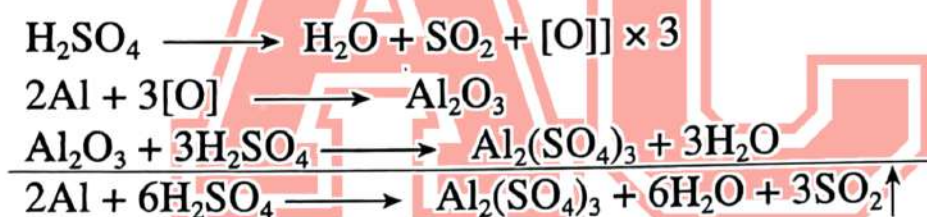
1. Hydrogen sulphide gas is passed into acidified $K_2Cr_2O_7$ solution?

Solution: When hydrogen sulphide gas is passed into acidified $K_2Cr_2O_7$ solution, then a green coloured solution is obtained along with deposition of little amount of pale yellow substance.



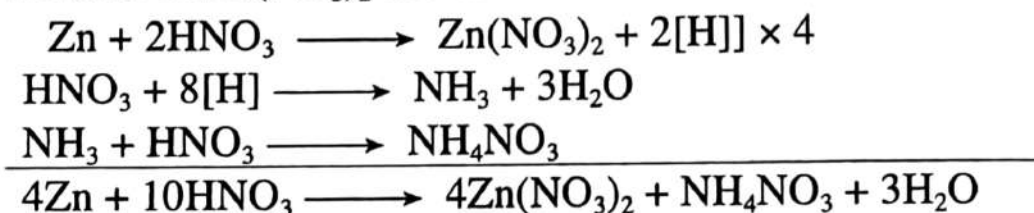
2. Aluminium is reacted with concentrated H_2SO_4 ?

Solution: When aluminium is heated with concentrated H_2SO_4 , SO_2 is produced along with formation of aluminium sulphate.



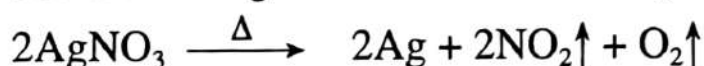
3. Zinc is treated with very dilute HNO_3 ?

Solution: When zinc is treated with very dilute HNO_3 , a mixture of $Zn(NO_3)_2$ and ammonium nitrate is obtained.



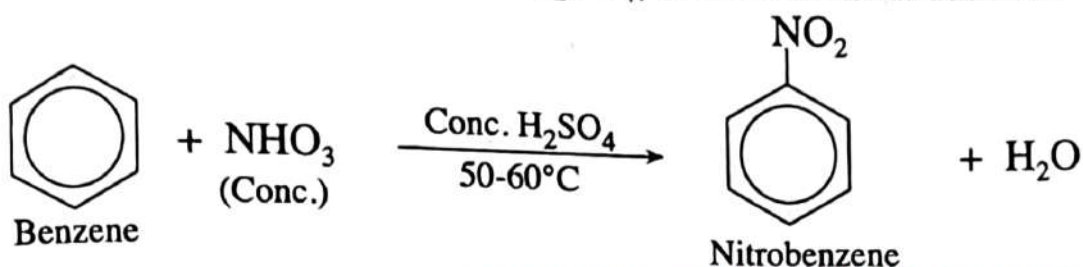
4. Silver nitrate is strongly heated?

Solution: When silver nitrate is heated strongly, metallic silver is obtained along with evolution of NO_2 and O_2 .



5. Benzene is heated with concentrated HNO_3 in the presence of concentrated H_2SO_4 ?

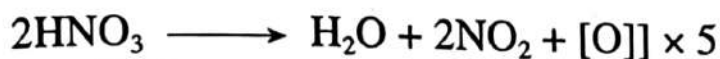
Solution: When benzene is heated with concentrated HNO_3 in the presence of concentrated H_2SO_4 , nitrobenzene is formed.



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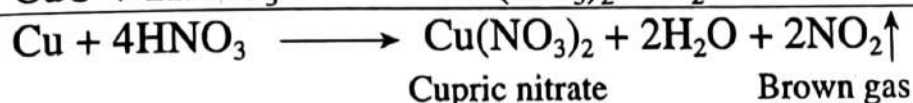
6. Concentrated HNO_3 reacts with iodine?

Solution: When iodine reacts with hot and concentrated HNO_3 , iodic acid is formed.



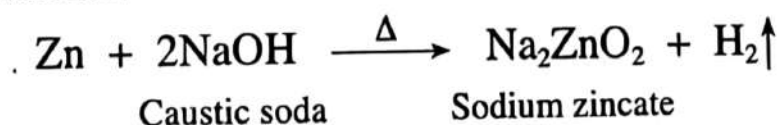
7. Copper is heated with concentrated HNO_3 ?

Solution: When copper is heated with concentrated HNO_3 , cupric nitrate is formed along with evolution of NO_2 gas.



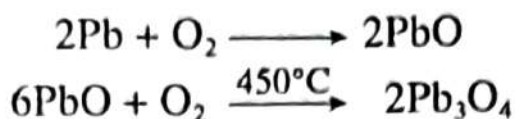
8. Zinc is boiled with caustic soda solution?

Solution: When zinc is boiled with caustic soda solution, hydrogen gas is evolved along with formation of sodium zincate.



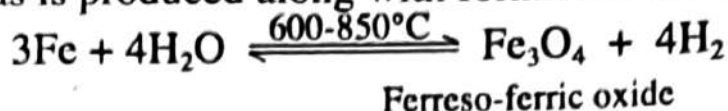
9. Lead is heated in air?

Solution: When lead is heated in air or with oxygen forms PbO (litharge) which on further heating to about 450°C forms red lead (Pb_3O_4).



10. Steam is passed over red hot iron?

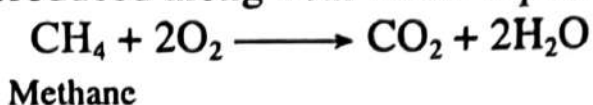
Solution: When steam is passed over red hot iron, hydrogen gas is produced along with formation of Fe_3O_4 .



11. Methane burns in air?

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Solution: When methane burns in air carbon dioxide is produced along with water vapours.



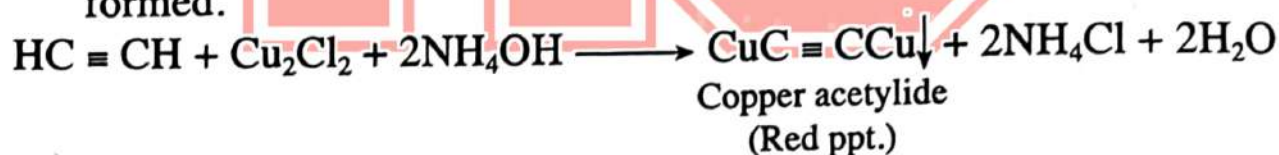
12. Copper coin is dropped into silver nitrate solution?

Solution: When copper coin is dropped into silver nitrate solution, cupric nitrate is formed along with formation of metallic silver.



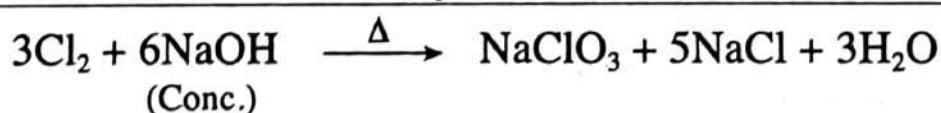
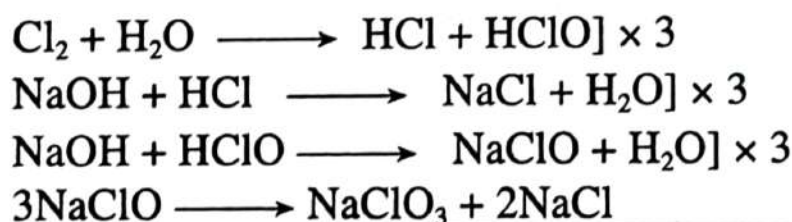
13. Acetylene gas is passed into ammoniacal cuprous chloride solution?

Solution: When acetylene is passed into ammoniacal solution of cuprous chloride, a red precipitate of cuprous acetylide is formed.



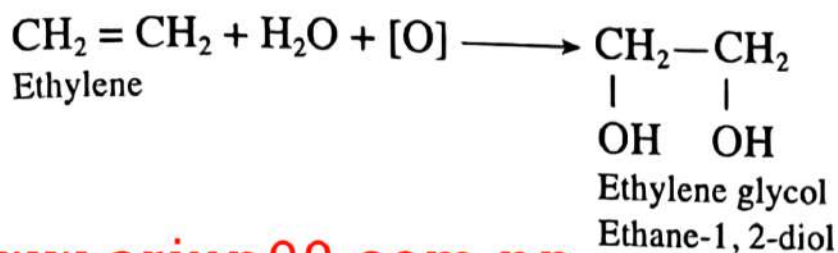
14. Chlorine is passed into hot and concentrated caustic soda solution?

Solution: When chlorine gas is passed through hot and concentrated caustic soda solution, a mixture sodium chloride and sodium chlorate is formed:



15. Ethylene gas is passed into alkaline KMnO_4 solution?

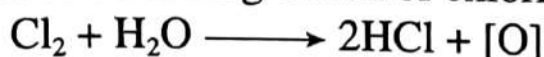
Solution: When ethylene gas is passed into alkaline KMnO_4 solution (Baeyer's reagent), ethylene glycol is formed and the pink colour of Baeyer's reagent is discharged.



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16. Moist red coloured flower is introduced into gas jar containing chlorine gas?

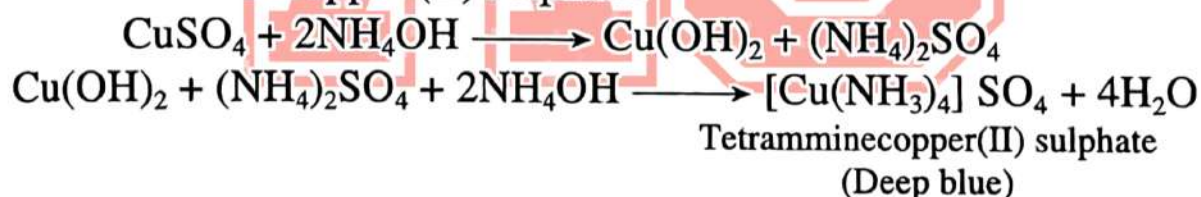
Solution: When moist red coloured flower is introduced into gas jar containing chlorine gas, then the flower is discoloured due to bleaching action of chlorine.



Vegetable colouring matter + $[\text{O}] \xrightarrow{\text{oxidation}}$ Oxidized colourless matter

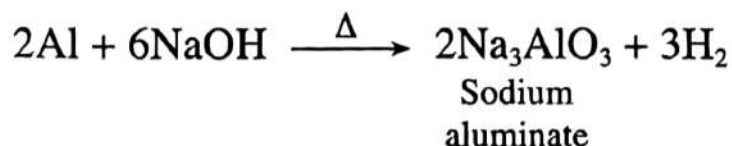
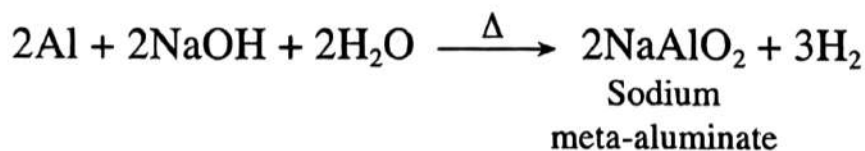
17. Ammonia is passed into copper sulphate solution for long time?

Solution: When ammonia gas is passed into copper sulphate solution, at first a bluish white precipitate is formed which dissolves in excess of ammonia forming a deep blue coloured solution due to formation of a soluble complex compound tetramminecopper (II) sulphate.



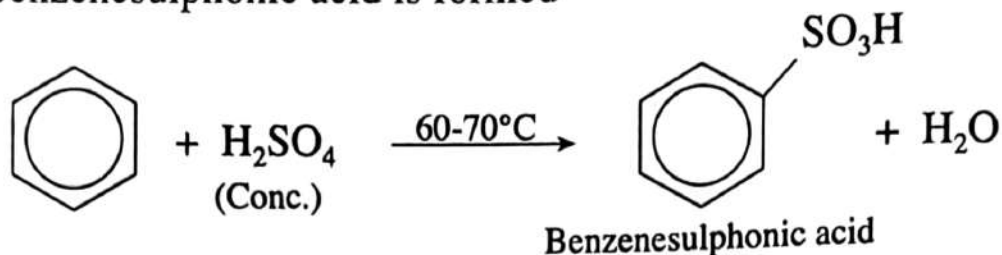
18. Aluminium is heated with sodium hydroxide solution?

Solution: When aluminium is heated with sodium hydroxide, hydrogen gas is evolved along with formation of soluble aluminates



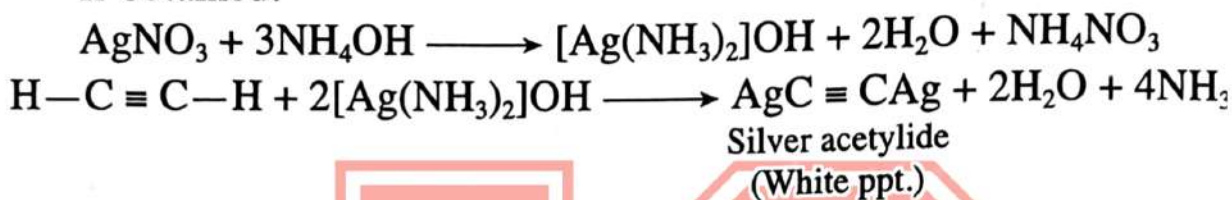
19. Benzene is treated with concentrated H_2SO_4 ?

Solution: When benzene is heated with concentrated H_2SO_4 , benzenesulphonic acid is formed



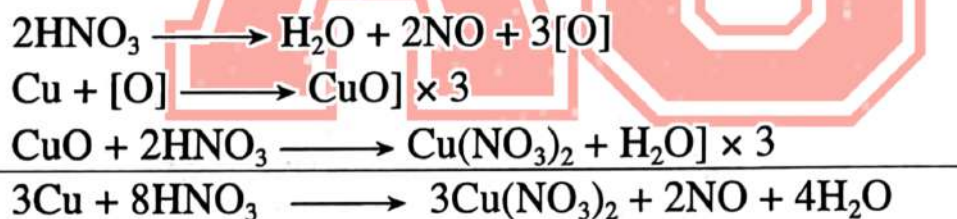
20. Acetylene gas is passed into silver nitrate solution?

Solution: When acetylene gas is passed into ammoniacal solution of silver nitrate, a white precipitate of silver acetylide is obtained.



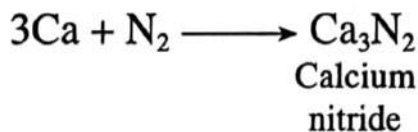
21. Copper is treated with dilute HNO_3 ?

Solution: When copper is treated with dilute HNO_3 , cupric nitrate is formed along with evolution of nitric oxide gas.



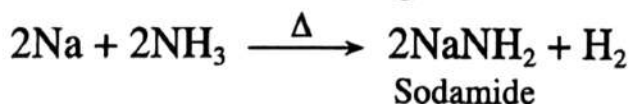
22. Calcium is burnt in atmosphere of nitrogen?

Solution: When calcium is burnt in atmosphere of nitrogen, calcium nitride is formed.



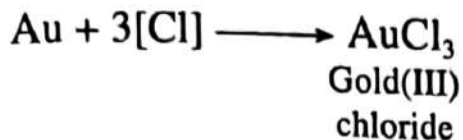
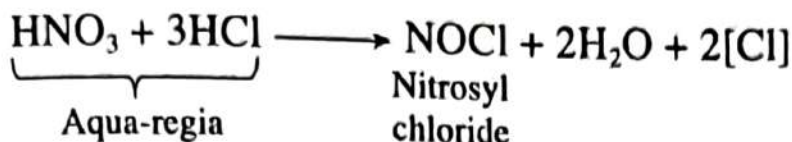
23. Ammonia is passed over heated sodium?

Solution: When ammonia is passed over heated sodium metal, sodamide is formed along with liberation of hydrogen gas.



24. Gold is treated with aqua-regia?

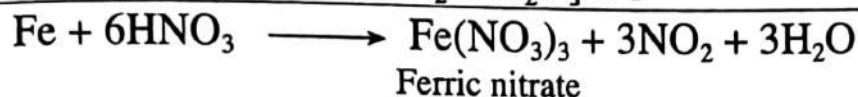
Solution: When gold is treated with aqua-regia, gold(III) chloride is formed.



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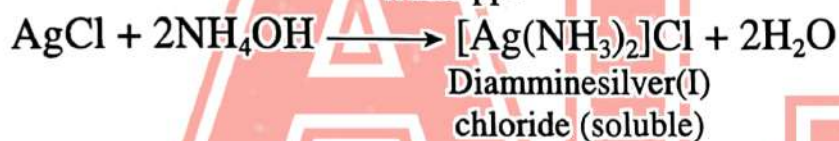
25. Iron is treated with moderately concentrated HNO_3 ?

Solution: When iron is treated with moderately concentrated HNO_3 , ferric nitrate is formed along with evolution of NO_2 gas.



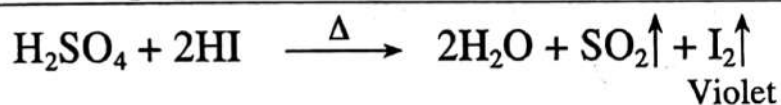
26. Hydrochloric acid is treated with silver nitrate solution followed by the addition of ammonia solution?

Solution: When hydrochloric acid is treated with silver nitrate solution, a white precipitate of silver chloride is formed which on adding ammonia solution gets dissolved due to formation of water soluble complex compound.



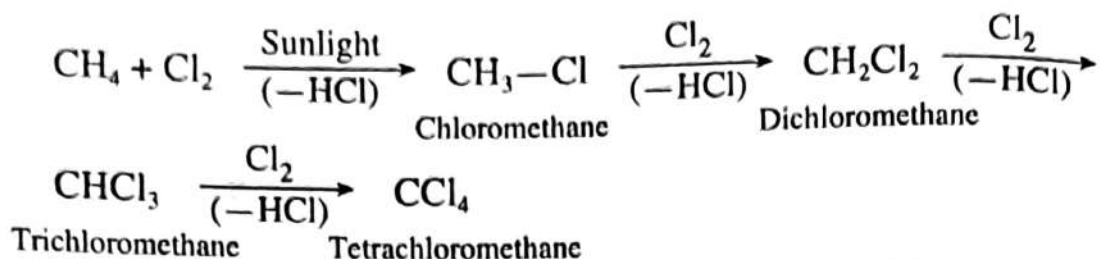
27. Concentrated H_2SO_4 is treated with HI ?

Solution: When concentrated H_2SO_4 is treated with HI , violet vapours of iodine are produced.



28. Methane reacts with chlorine in presence of diffused sunlight?

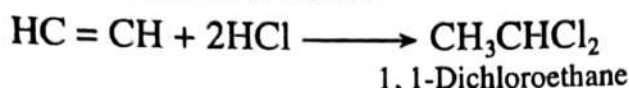
Solution: When methane reacts with chlorine in the presence of diffused sunlight, a mixture of CH_3Cl , CH_2Cl_2 , CHCl_3 and CCl_4 is obtained.



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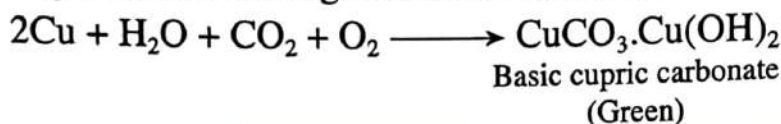
29. *Acetylene reacts with hydrochloric acid?*

Solution: When acetylene reacts with hydrochloric acid, 1, 1-dichloroethane is formed.



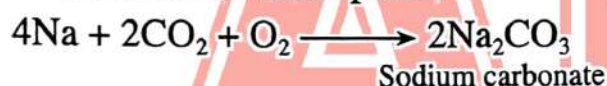
30. *A piece of copper metal is exposed in moist atmosphere?*

Solution: When a piece of copper metal is exposed to moist air, it is slowly converted into green basic carbonate.



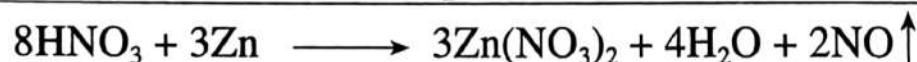
31. *Sodium is burnt in the atmosphere of CO₂?*

Solution: When sodium is burnt in atmosphere of CO₂, formation of sodium carbonate takes place.



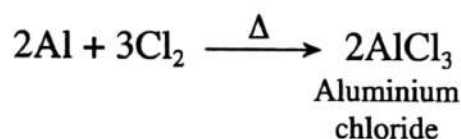
32. *Zinc is dissolved in moderately concentrated HNO₃?*

Solution: When zinc is dissolved in moderately concentrated HNO₃, zinc nitrate is formed along with evolution of NO gas



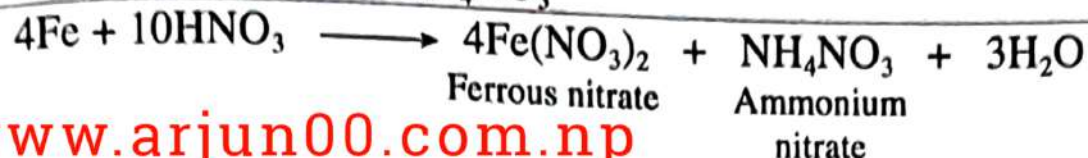
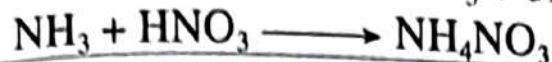
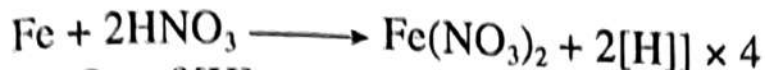
33. *Chlorine is passed over finely powdered aluminium?*

Solution: When chlorine is passed over heated finely powdered aluminium, aluminium chloride is formed



34. *Iron is allowed to react with very dilute HNO₃?*

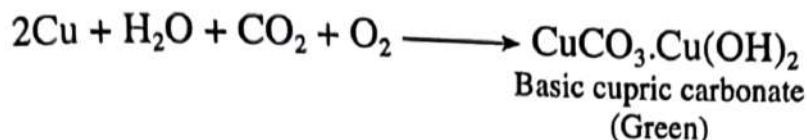
Solution: When iron is allowed to react with very dilute HNO₃, a mixture of ferrous nitrate and ammonium nitrate is obtained.



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35. Copper is treated with moist air containing CO_2 ?

Solution: When copper is treated with moist air containing CO_2 , it turns green due to formation of basic cupric carbonate.



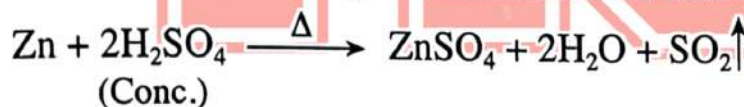
36. Ammonia gas is treated with excess of chlorine?

Solution: When ammonia is treated with excess of chlorine, an explosive substance, nitrogen trichloride is formed.



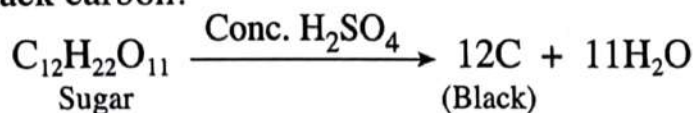
37. Zinc is heated with concentrated H_2SO_4 ?

Solution: When zinc is heated with concentrated H_2SO_4 , sulphur dioxide is evolved along with formation of zinc sulphate.



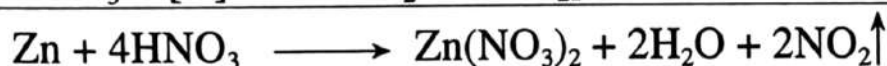
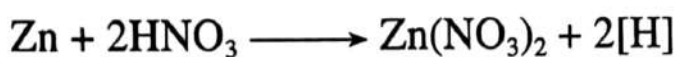
38. Concentrated H_2SO_4 is dropped on sugar?

Solution: When concentrated H_2SO_4 is dropped on sugar, it extracts water and brings about charring. Sugar chars due to the formation of black carbon.



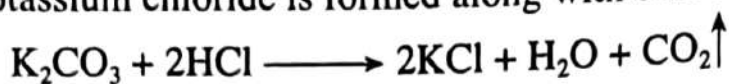
39. Zinc is treated with concentrated HNO_3 ?

Solution: When zinc is treated with hot and concentrated HNO_3 , zinc nitrate is formed along with evolution of NO_2 gas.



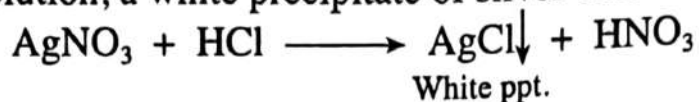
40. Potassium carbonate is treated with dilute HCl?

Solution: When potassium carbonate is treated with dilute HCl, potassium chloride is formed along with carbon dioxide gas.



41. Hydrogen chloride is passed into silver nitrate solution?

Solution: When hydrogen chloride is passed into silver nitrate solution, a white precipitate of silver chloride is formed.



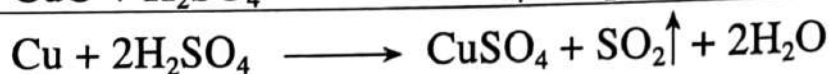
42. Zinc strip is immersed into ferrous sulphate solution?

Solution: When zinc strip is immersed into ferrous sulphate solution, it gets dissolved forming zinc sulphate along with precipitation of metallic iron.



43. Copper is heated with conc. H_2SO_4 ?

Solution: When copper is heated with concentrated H_2SO_4 , sulphur dioxide gas is produced along with formation of copper sulphate.



44. sodium nitrate is strongly heated?

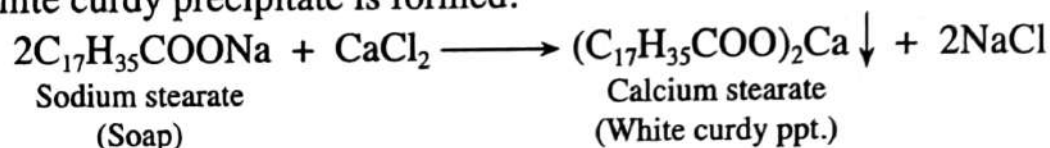
Solution: When sodium nitrate is strongly heated, sodium nitrite is formed along with evolution of oxygen gas.



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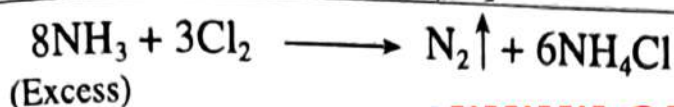
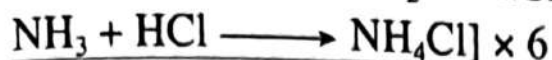
45. Soap is treated with hard water containing CaCl_2 ?

Solution: When soap is treated with hard water containing CaCl_2 , a white curdy precipitate is formed.



46. Chlorine reacts with excess of ammonia?

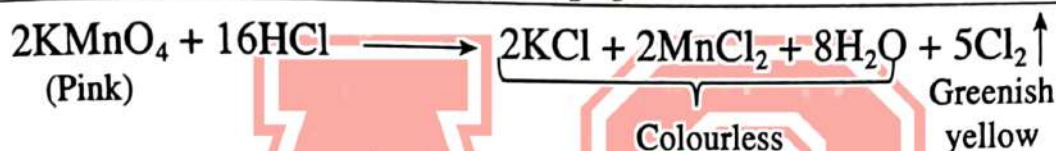
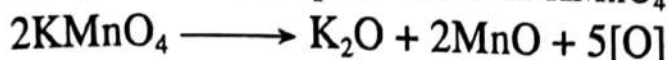
Solution: When chlorine reacts with excess of ammonia, ammonium chloride is formed along with evolution of N_2 gas.



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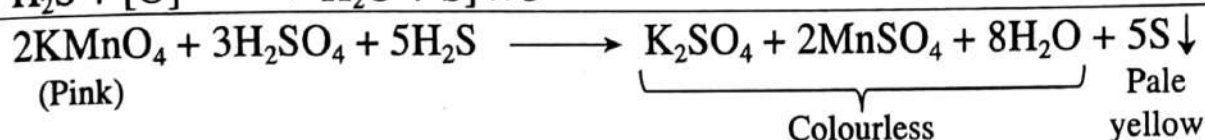
47. Hydrogen chloride gas is passed into $KMnO_4$ solution?

Solution: When hydrogen chloride gas is passed into acidified $KMnO_4$ solution, the pink colour of $KMnO_4$ is discharged.



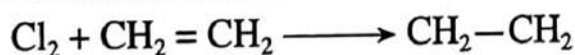
48. Hydrogen sulphide gas is passed into acidified $KMnO_4$ solution?

Solution: When hydrogen sulphide gas is passed into acidified $KMnO_4$ solution, the pink colour of $KMnO_4$ is discharged.



49. Chlorine is treated with ethylene?

Solution: When chlorine is treated with ethylene, 1,2-dichloroethane is formed.



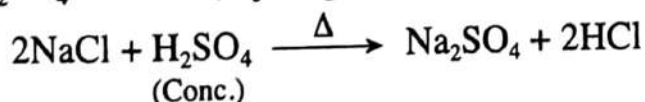
Ethylene

Cl Cl

1,2-Dichloroethane

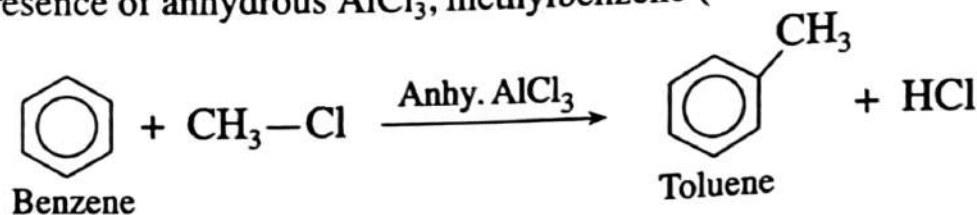
50. The mixture of sodium chloride and concentrated H_2SO_4 is heated?

Solution: When a mixture of sodium chloride and concentrated H_2SO_4 is heated, hydrogen chloride gas is produced.



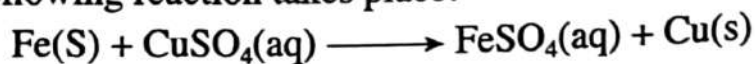
51. Benzene is treated with methyl chloride in the presence of anhydrous AlCl_3 ?

Solution: When benzene is treated with methyl chloride in the presence of anhydrous AlCl_3 , methylbenzene (toluene) is formed.



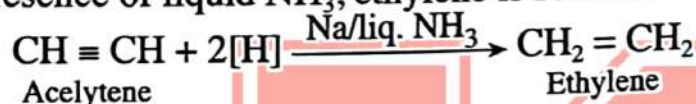
52. Iron rod is immersed into copper sulphate solution?

Solution: When iron rod is immersed into copper sulphate solution following reaction takes place.



53. Acetylene gas is reacted with metallic sodium in the presence of liquid NH_3 ?

Solution: When acetylene gas is reacted with metallic sodium in the presence of liquid NH_3 , ethylene is formed.



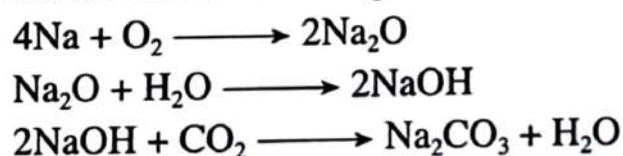
54. Lead is heated with oxygen below 300°C ?

Solution: When lead is heated with oxygen below 300°C , litharge (PbO) is formed.



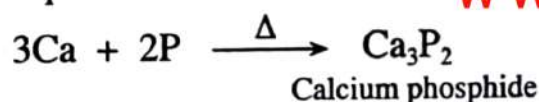
55. Sodium metal is exposed to moist air?

Solution: When sodium metal is exposed to moist air, it gets tarnished due to following reactions.



56. Calcium metal is heated with phosphorus?

Solution: When calcium metal is heated with phosphorus, calcium phosphide is formed.



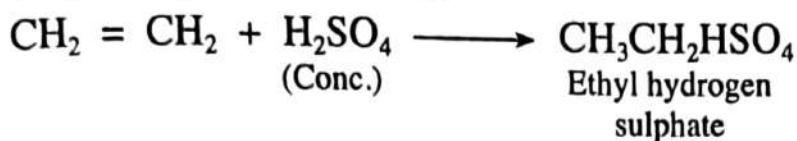
57. Lead is boiled with concentrated hydrochloric acid?

Solution: When lead is boiled with concentrated hydrochloride acid, a water soluble lead complex is formed.



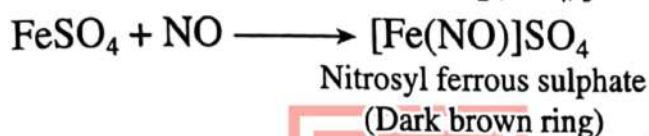
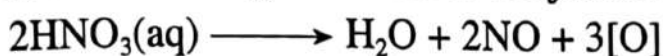
58. Ethylene reacts with concentrated H_2SO_4 ?

Solution: When ethylene reacts with concentrated H_2SO_4 , ethyl hydrogen sulphate is formed.



59. Freshly prepared $FeSO_4$ solution is added to the mixture of concentrated HNO_3 and concentrated H_2SO_4 ?

Solution: When freshly prepared $FeSO_4$ solution is added to a well cooled mixture of concentrated HNO_3 and concentrated H_2SO_4 , a dark coloured ring is formed at the junction of two liquids.



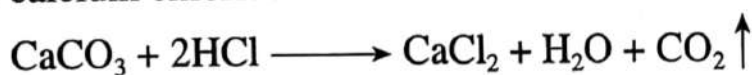
60. Silver is exposed to air containing H_2S gas?

Solution: When silver is exposed to air containing H_2S gas, it blackens due to formation of silver sulphide



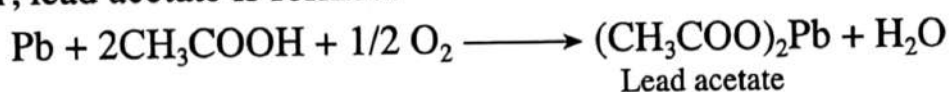
61. Calcium carbonate comes in contact with hydrochloric acid?

Solution: When calcium carbonate comes in contact with hydrochloric acid, carbon dioxide gas evolved along with formation of calcium chloride.



62. Lead is treated with acetic acid in presence of air?

Solution: When lead is treated with acetic acid in the presence of air, lead acetate is formed.



63. Carbon monoxide reacts with iron at $120^\circ C$?

Solution: When carbon monoxide reacts with iron at $120^\circ C$, iron penta carbonyl is formed.

