

FBQ1: The crystals of alum are removed from the solution by _____ and washed with an alcohol/water mixture

Answer: Vacuum filtration

FBQ2: Caution should be exercised when handling KOH because it is _____ and will dissolve clothing and skin

Answer: Corrosive

FBQ3: Alcohol is added to water during washing of _____ of aluminium because alcohol is more volatile than water

Answer: Crystals

FBQ4: In the preparation of _____ from piece of aluminium beverage can, when hydrogen bubbles are no longer formed the reaction is complete.

Answer: Alum

FBQ5: When 20 ml of 4 M _____ was added to the piece of aluminium the reactant was then heated in order to speed up the reaction.

Answer: KOH

FBQ6: After heating KOH with aluminium mixture, the solution turns _____ colour

Answer: greyish

FBQ7: When sulphuric acid was added to the cooled solution of aluminium and potassium hydroxide white lumps of _____ were formed in the solution

Answer: $\text{Al}(\text{OH})_3$

FBQ8: If no crystal of alum was observed falling to the bottom of the beaker after scratching the bottom of the beaker, add a _____ crystals of alum to facilitate the crystallization.

Answer: seed

FBQ9: Alum is a white crystal that can be used for water purification, _____, as an astringent and in baking powder.

Answer: leather tanning

FBQ10: In the proximate analysis of alum the three parameters that were determined are _____

Answer: melting temperature, water of hydration and % sulphate of alum

FBQ11: When determining the % sulphate of alum _____ was added to completely precipitate ions of sulphate in the beaker of alum solution.

Answer: 0.20 M $\text{Ba}(\text{NO}_3)_2$

FBQ12: A solution of sulphuric acid is used to extract alum from its ore form, _____

Answer: bauxite

FBQ13: Cobalt has the outer electronic configuration _____

Answer: $3d^7 4s^2$

FBQ14: The highest significant oxidation state of cobalt is _____

Answer: +4

FBQ15: In an aqueous solution containing no complexing agents, cobalt (III) is easily reduced to _____

Answer: Cobalt (II)

FBQ16: The oxidation state of cobalt that is more stable in the presence of complexing agents such as ammonia is _____

Answer: Cobalt (III)

FBQ17: _____ forms both octahedral and tetrahedral complexes but they are labile and they have a strong tendency to be oxidised by molecular oxygen.

Answer: Cobalt (II)

FBQ18: _____ Complexes are often highly coloured owing to their lower order of symmetry related to the octahedral complexes.

Answer: Tetrahedral cobalt (II)

FBQ19: In aqueous solution the colour of cobalt (II) ion is _____

Answer: pale pink

FBQ20: The colour of cobalt (II) is as a result of its absorption being weak and occurs in the _____ region of the visible light.

Answer: blue

FBQ21: The spectrum of $[\text{CoCl}]_2^-$ shows a large absorption in the visible part of the spectrum, which accounts for its _____ colour.

Answer: deep-blue

FBQ22: Cobalt (III) salts are difficult to prepare because the ion is a strong _____

Answer: oxidizing agent

FBQ23: Cobalt (III) has high affinity for _____, water molecules and halide ions.

Answer: Nitrogen donors

FBQ24: _____, oxidation with an agent and oxidation in the presence of a catalyst are the three major methods that depend on oxidation of cobalt (II) for preparation of Hexaamminecobalt (III) salts.

Answer: air oxidation

FBQ25: One of the _____ agents for cobalt (II) in preparation of Hexaamminecobalt (III) is hydrogen peroxide.

Answer: oxidizing

FBQ26: When preparing Hexaamminecobalt (III) salt, in the presence of a catalyst, equilibrium between _____ and _____ is established at room temperature and atmospheric pressure.

Answer: pentamine and hexamine

FBQ27: _____ or decolorizing charcoal are the best catalyst for oxidation of cobalt (II) during preparation of Hexaamminecobalt (III) salt.

Answer: Diamminesilver

FBQ28: Air cannot be used as oxidant when the cobalt (II) is slightly soluble in the _____ solution.

Answer: ammoniacal

FBQ29: The use of decolorizing charcoal as a catalyst for oxidation of cobalt (II) in the preparation of Hexaamminecobalt (III) salt was design by _____

Answer: J.B. Jerrum

FBQ30: Aside being simple, and less time consuming the J.B. Jerrum method also gives high yield of _____

Answer: pure compounds

FBQ31: When air is bubbled into the mixture as described by J.B. Jerrum method of preparing Hexaamminecobalt (III) salt, the colour change from red to _____.

Answer: yellowish-brown

FBQ32: The preferred oxidant for preparation of $[\text{Co}(\text{NH}_3)_6]\text{Br}_3$ is _____.

Answer: hydrogen peroxide

FBQ33: The reason why air cannot be used as oxidant in the preparation of $[\text{Co}(\text{NH}_3)_6]\text{Br}_3$ is because the compound is _____ in ammoniacal solution.

Answer: Slightly soluble

FBQ34: Hexaamminecobalt(III) chloride is precipitated by adding 400ml of conc. _____ and slowly cooling to 0°C .

Answer: hydrochloric acid

FBQ35: The Hexaamminecobalt(III) chloride precipitate is filtered and wash first with 60 % alcohol then with _____

Answer: 95 % alcohol

MCQ1: Apart from their representation of large proportion world energy, fossil fuels are also used for manufacturing _____?

Answer: Plastics, synthetic fabrics and medicines

MCQ2: The weight loss of charcoal upon heating is its _____?

Answer: Moisture content

MCQ3: The volatile combustible matter (VCM) of a charcoal indicates _____?

Answer: All of the option above

MCQ4: What are hydrates?

Answer: Crystalline salt that are bonded to water molecule in definite proportion

MCQ5: The weakly bonded water molecules are known as ?

Answer: Water of hydration and crystallization

MCQ6: On heating a copper sulphate crystal, a colour change from blue to white was observed and the blue colour reappears again upon cooling the crystals in an open container. Which of these best describes what happens to the crystals?

Answer: The water of hydration of the crystal was lost during heating and gained on cooling

MCQ7: Indicate which one of these substances acts similar to hydrates?

Answer: Deliquescent substance

MCQ8: The percentage of hydrated water can be calculated as, $\%H_2O = \frac{\text{num. } H_2O \text{ molecules}}{\text{molecular mass of hydrate}} \times 100$. True or false?

Answer: False

MCQ9: Which one of these substances is used as a drying agent?

Answer: Hygroscopic substances

MCQ10: Gravimetric analysis can be generalized into ?

Answer: Precipitation and volatilization

MCQ11: Give two common examples of inorganic precipitating agents

Answer: Silver nitrate and barium chloride

MCQ12: Sodium tetraphenylborate can be used to precipitate the following except ?

Answer: Chloride ions

MCQ13: The products of precipitation are ?

Answer: salts

MCQ14: The possible bond holding precipitation together when inorganic precipitating reagents are added include ?

Answer: Ionic bond

MCQ15: The bond formed between organic precipitating agents that contain a carboxylic group and metallic ions in solution is ?

Answer: Covalent bond

MCQ16: What is the name of a ring-like product formed between a multi-dentate ligand and a cation?

Answer: Chelate

MCQ17: A bi-dentate ligand is an organic reagent containing how many functional groups and can combine with metallic ions

Answer: Two functional groups

MCQ18: Below are the three major requirements for a good gravimetric analysis except?

Answer: The reagent will react only with the analytes of interest to form ionic solution

MCQ19: In the precipitation process of chloride ions when insufficient amount of silver nitrate is used predict what will happen to this procedure?

Answer: All of the above

MCQ20: What is the simple procedure for checking complete precipitation occurrence of chloride ions using silver nitrate reagent?

Answer: Without stirring further, add silver nitrate until the solution remains clear

MCQ21: Why must we cover the product of precipitation reaction between chloride ion and silver nitrate reagent?

Answer: To avoid decomposition of the silver chloride in the presence of light

MCQ22: What is the name of the indicator used in complexometric titration between silver nitrate and sodium chloride?

Answer: Eriochrome black T indicator

MCQ23: The end point colour change during complexometric titration is?

Answer: Pale-blue

MCQ24: One of the common differences between acid-base and complexometric titration is?

Answer: Complexometric analysis are useful for determination of mixture of different ions in solution

MCQ24: Hard water is due to the presence of the following except

Answer: Na^+

MCQ26: Scaly residue upon evaporation is a characteristic of?

Answer: Hard water

MCQ27: The indicator used in determining the end point of complexometric titration in hard water analysis is called?

Answer: Mordant Black II

MCQ28: What is the role of EDTA in complexometric titration?

Answer: It is a chelating agent

MCQ29: The end point colour change of complexometric titration for calcium and magnesium in the presence of suitable indicator is?

Answer: Blue colour

MCQ30: The chemical formula of Alum is?

Answer: $\text{KAl}(\text{SO}_4) \cdot 12\text{H}_2\text{O}$

MCQ31: Why are aluminium beverage cans not reactive with the beverage contents

Answer: Because the cans have thin plastic coating on the inside

MCQ32: To remove the thin plastic coating on the walls of the aluminium, the metal is dissolved in which solution?

Answer: Potassium hydroxide solution

MCQ33: What are major residual impurities that are removed from the aluminium beverage can?

Answer: Plastics and aluminium ions

MCQ34: The clear colourless solution observed when impurities are removed from aluminium beverage can include?

Answer: Potassium hydroxide and aluminium hydroxide

MCQ35: The reagent used to precipitate aluminium from aluminate is ?

Answer: Sulphuric acid

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