

CHM191 List of Questions

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Q1 In redox titration involving potassium permanganate, if the contents of the conical flask turn brown, it means _____ was added

- ☐ Insufficient acid catalyst
- ☐ Insufficient base catalyst
- ☐ Insufficient catalyst
- ☐ all of the above

Q2 Potassium permanganate is a self-indicating reagent because of its different characteristic _____ in either the acidic or basic medium

- ☐ Colour change
- ☐ Colour stability
- ☐ solubility
- ☐ oxidation state

Q3 Potassium permanganate can be used to estimate the _____ of a substance

- ☐ Valency
- ☐ water of hydration
- ☐ reactivity
- ☐ percentage purity

Q4 $\text{IO}_3^- + \text{SO}_3^{2-} \rightarrow \text{I}^- + \text{SO}_4^{2-}$ The oxidation state of oxygen in the product's equation is _____

- ☐ +3
- ☐ +6
- ☐ -3
- ☐ +6

Q5 $\text{IO}_3^- + \text{SO}_3^{2-} \rightarrow$ the oxidation state of oxygen in the equation is _____

- ☐ -2
- ☐ -4
- ☐ +4
- ☐ +2

Q6 A substance which loses water of hydration upon exposure to atmosphere is called?

- ☐ Deliquescent substance
- ☐ Efflorescence substance
- ☐ Anhydrous substance
- ☐ Hygroscopic substance

Q7 Volumetric analysis involving iodine are usually referred to as _____

- ☐ iodotitration
- ☐ iodine acid titration
- ☐ halogenmetry
- ☐ iodometry

Q8 In the _____, standard solutions of iodine are used to estimate directly the concentrations of some oxidizable species.

- ☐ Direct method
- ☐ indirect method
- ☐ standard method
- ☐ calibrated method

Q9 Of all the oxidizable species available for use, iodine titration are usually used with the _____

- ☐ sulphate ions
- ☐ Thiopsulphate
- ☐ hydrogensulphate
- ☐ thioesters

Q10 The colour changes accompanying the varying change in oxidation states of iodine and its ion can be used to indicate the _____

- ☐ Iodine complexity

- ☐ initial point
- ☒ end point
- ☐ all of the above

Q11 The most commonly used external indicator for iodine titration is _____

- ☐ Glucose solution
- ☐ hydrogen chloride
- ☐ Protein solution
- ☒ starch solution

Q12 The starch solution forms a _____ complex with the tri-iodide ion during the titration that is rapidly discharge at the end point

- ☐ Light blue
- ☐ Blue
- ☒ Blue black
- ☐ Brick red

Q13 Thus using starch as indicator, the colour variations of the solution depend on _____ formation of the starch with iodide ion formed in the last stage of the titration.

- ☒ Complex
- ☐ Colloid
- ☐ Hydrolysed
- ☐ non of the above

Q14 For this reason and in order to avoid complications in the end point detection, the starch indicator is added at the _____ colouration of the solution which is near the end point

- ☐ Yellow
- ☒ Light yellow
- ☐ Colourless
- ☐ Dark yellow

Q15 Complete the colour change in iodometry analysis. _____ (initially)??

- ☐ Red-orange
- ☐ Dark-brown
- ☐ Brown
- ☒ Red-brown

Q16 Light yellow colouration is observed at near end point of the iodometry analysis. True or false ____

- ☐ True
- ☐ False
- ☐ Partially true
- ☐ Indifferent

Q17 During iodometry analysis the blue black colouration appear at the end of the titration. True or false ____

- ☐ True
- ☒ False
- ☐ Partially true
- ☐ Indifferent

Q18 The oxidation potentials of Na is _____

- ☐ 11
- ☐ 23
- ☐ 271
- ☒ 2.71

Q19 The study of thermal changes in chemical and physical processes is known as _____

- ☐ thermochemistry
- ☒ Thermodynamics
- ☐ A and B
- ☐ B only

Q20 The _____ is the amount of heat released or observed for a given amount of reactants or products

- ☒ heat of reaction
- ☐ heat of combustion

- ☐ heat of neutralization
- ☐ heat of formation

Q21 Predict the colour of methyl orange when pH is 8?

- ☐ Pink
- ☐ Orange
- ☒ Yellow
- ☐ Blue

Q22 At complete neutralization point, the litmus paper colour turns?

- ☐ Yellow
- ☐ Red
- ☐ Blue
- ☒ Purple

Q23 At neutralization point the pH value is?

- ☒ seven
- ☐ zero
- ☐ fourteen
- ☐ one

Q24 What is a pH of a solution?

- ☐ It is the measure of base concentration in the solution
- ☒ It is the measure of hydrogen ions concentration in the solution
- ☐ It is the measure of acid concentration in the solution
- ☐ It is the measure of hydroxyl ions concentration in the solution

Q25 In an acid base titration conducted by a student the colour of the solution in the beaker changed from colourless to pink when phenolphthalein was used as an indicator, what went wrong?

- ☐ The base was stronger than the acid
- ☐ The acid base ions are at equilibrium
- ☒ The beaker was occupied by acid solution instead of base.
- ☐ The titration time was overdue

Q26 Which of the following options is an indicator use for acid-base titration?

- ☐ Methylbenzene
- ☐ Bromohexane
- ☐ phenol
- ☒ Methyl orange

Q27 The point at which stoichiometrically equivalent quantities of substance have been brought together is known as?

- ☒ Equivalence point of titration
- ☐ Saturated point of titration
- ☐ End point of titration
- ☐ Neutralization point of titration

Q28 The concentration of pure HCl 11.7 Molar if 20 cm^3 of the acid is diluted to 250 cm^3 to give concentration of 0.936 mol.dm^3 substitute this values on this equation; $C_1V_1 = C_2V_2$?

- ☐ $12.636 \times 270 = C_1 \times 20$
- ☒ $11.7 \times 20 = 0.936 \times 250$
- ☐ $0.936 \times 250 = 11.7 \times 20$
- ☐ $11.7 \times 250 = 0.936 \times 20$

Q29 Give reason why water should not be added to acid during carrying out acid-base titration?

- ☐ The procedure can cause explosion
- ☐ The acid is hygroscopic and will cause explosion when added to water
- ☒ The dissolution of acid in water is exothermic which may cause explosion
- ☐ The acid is corrosive and can destroy the glass ware

Q30 A table of requirement for laboratory experiment contains the following except?

- ☐ Quantity of apparatus
- ☐ List of apparatus
- ☐ List of chemicals

- ☐ List of weight of each reagents

Q31 A substance which takes in only moisture upon exposure to atmosphere is refer to as?

- ☐ Deliquescence substance
- ☐ Anhydrous substance
- ☐ Efflorescence substance
- ☐ Hygroscopic substance

Q32 A substance which loses water of hydration upon exposure to atmosphere is called?

- ☐ Deliquescent substance
- ☐ Efflorescence substance
- ☐ Anhydrous substance
- ☐ Hygroscopic substance

Q33 If 2 cm³ of a stoke solution contains 1 mole of an acid how would you prepare 1 molar concentration of that acid in 250 cm³ of water?

- ☐ Dissolve 2 cm³ of the stoke solution in 250 cm³ of water
- ☐ Dissolve 1 cm³ of the stoke solution in 250 cm³ of water
- ☐ Dissolve 2 cm³ of the stoke solution in 248 cm³ of water
- ☐ Dissolve 1 cm³ of the stoke solution in 249 cm³ of water

Q34 In a chemistry laboratory a stoke bottle of acid solution reads, 1.25 specific gravity; what does that mean?

- ☐ It means 100 cm³ of that solution weight 12500 g
- ☐ It means 1 cm³ of that solution weight 1250 g
- ☐ It means 1 cm³ of the weight 125 g
- ☐ 1 cm³ of that solution weight 1.25 g

Q35 A solution contains 1.2 Molar concentration, what volume of it must be diluted with water to give 600 mls of 0.5 Molar solution?

- ☐ 25 mls
- ☐ 300 mls
- ☐ 600 mls
- ☐ 575 mls

Q36 In preparing a standard solution, two factors must be considered?

- ☐ 1. The solute must be solid and 2. the solvent must be liquid
- ☐ 1. The solute must be pure and 2. a suitable solvent be measured to definite volume
- ☐ 1. The solvent must be water and 2. the solute must be crystal form
- ☐ 1. The solute's nature must be known and 2. the solvent can be unknown

Q37 Define standard solution?

- ☐ A solution of which the concentration is partially known
- ☐ Concentration which has 1 mol dissolved in 1 dm³ of solvent
- ☐ A solution of which the concentration is accurately known
- ☐ A solution containing a pure substance dissolve in a known volume of solvent

Q38 What is the w/v percentage concentration of 300ml of NaCl(aq) containing 5 g NaCl?

- ☐ 1.66 % w/v
- ☐ 305 % w/v
- ☐ 150 % w/v
- ☐ 60 % w/v

Q39 Calculate the mass of NaCl in 450 g of NaCl solution containing NaCl w/w %?

- ☐ 485 g
- ☐ 450 g
- ☐ 35 g
- ☐ 157.5 g

Q40 What is the percentage w/w % ethanol if 5 g of ethanol is dissolved in 20 g of water?

- ☐ 72 % w/w
- ☐ 20 % w/w
- ☐ 5 % w/w
- ☐ 25 % w/w

Q41 One of the disadvantages of acid-base titration is?

- ☐ Large quantity of the sample(s) is required
- ☐ Takes longer time for reaction to start
- ☐ The acid need to be handled with care
- ☒ Requires careful attention to reach end point accurately

Q42 All are advantages of acid base titration except?

- ☐ Simple to do
- ☒ Less accuracy and precision
- ☐ Cost effective
- ☐ Do not need high expertise

Q43 The equation $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$ is a ____?

- ☐ Acid base reaction
- ☐ Oxidation reaction
- ☒ Neutralization reaction
- ☐ Reduction reaction

Q44 When performing acid-base titration, one should first?

- ☒ Rinse the burette twice with acid solution
- ☐ Fill the burette twice with acid solution
- ☐ Fill the burette twice with base solution
- ☐ Rinse the burette twice with base solution

Q45 Which of these is a method of finding the equivalence point?

- ☐ PH indicator
- ☐ Amperometry
- ☐ Thermometric titrametry
- ☒ All of the above

Q46 What is a titrant in titration analysis?

- ☐ Unknown concentration and volume of an analyte
- ☒ Known concentration and volume of an analyte
- ☐ Partially unknown concentration and volume of acid
- ☐ Partially known concentration and volume of an analyte

Q47 What is a titrand in titration analysis?

- ☐ Known concentration of an analyte
- ☐ Partially known concentration of an analyte
- ☐ Partially unknown concentration of acid
- ☒ Unknown concentration of an analyte

Q48 During acid-base titration sulphuric acid would be dissociated into what ions?

- ☐ $\text{H}^+ + \text{SO}_4^{2-}$
- ☐ $\text{H}^- + \text{SO}_4^{2-}$
- ☒ $2\text{H}^+ + \text{SO}_4^{2-}$
- ☐ $\text{H}_2 + \text{SO}_4^{2-}$

Q49 Both molarity and normality are measures of concentration. True or false?

- ☐ True
- ☐ Partially true
- ☐ false
- ☒ Indifferent

Q50 Choose the most suitable water for use in acid base titration?

- ☐ Distilled water
- ☒ Deionised water
- ☐ Temporary hard water
- ☐ Permanent hard water

Q51 A student used a hard tap water and performed an acid base titration. In few lines explain what would happen to his result?

- ☐ The starting solution would be more acidic as such it would consume more base to achieve the equivalence point
- ☒ the student cannot get an equivalence point owing to the fact that tap water was used not distilled water

- ☐ The solution would require more of indicator at the beginning of the experiment
- ☐ the starting solution would be more alkaline therefore it would require more volume of acid than expected

Q52 A 25 ml solution of 0.5 M NaOH is titrated until neutralized into a 50 ml sample of HCl?

- ☐ 50 mol
- ☐ 0.125 mol
- ☐ 0.25 mol
- ☐ 0.5 mol

Q53 What is the importance of back titration?

- ☐ To determine the concentration of a substance that is in excess after a chemical reaction.
- ☐ To determine the base in excess.
- ☐ To determine the acid in excess.
- ☐ To determine the average value of acid base titration.

Q54 What is the implication of adding a phenolphthalein as an indicator during the titration of HCl against Na₂CO₃?

- ☐ The end point will appear when only half of Na₂CO₃ has been used
- ☐ The end point will appear at the first drop of the acid.
- ☐ The end point will appear when half of the HCl has been used.
- ☐ The indicator will be sensitive to the acid alone

Q55 Which of these indicators will be suitable for use in titration involving a weak acid and a strong base?

- ☐ Any indicator
- ☐ Phenolphthalein
- ☐ Methyl orange
- ☐ No suitable indicator

Q56 What type of indicator will be suitable for use in a titration involving H₂SO₄ + NH₃(aq)?

- ☐ Phenolphthalein
- ☐ Methyl orange
- ☐ Any indicator
- ☐ No suitable indicator

Q57 An example of a strong acid is?

- ☐ H_2SO_3
- ☐ CH_3COOH
- ☐ $\text{H}_2\text{C}_2\text{O}_4$
- ☐ H_2SO_4

Q58 What is a strong acid?

- ☐ Any acid that ionizes completely in solution
- ☐ Any acid which turns blue litmus paper red
- ☐ Any acid that is highly corrosive and can cause burn to the skin
- ☐ Any acid whose pH is less than 3

Q59 An indicator X was added to an acid solution in a beaker but no colour change was observed give the name of the indicator X?

- ☐ Methyl orange
- ☐ Bromothymol
- ☐ Phenolphthalein
- ☐ Litmus paper

Q60 What is the colour of bromothymol when added to an acid solution?

- ☐ Blue
- ☐ Red
- ☐ Yellow
- ☐ Colourless

Q61 The unit μg is equivalent to?

- ☐ 10^{-3} Kg
- ☐ 10^{-6} Kg
- ☐ 10^{-12} Kg
- ☐ 10^{-9} Kg

Q62 When filtration is carried out under reduced pressure is called?

- ☐ Pressure filtration
- ☐ Simple filtration
- ☐ Ordinary filtration
- ☒ Suction filtration

Q63 The unit of a volume express in dm^3 is equivalent to?

- ☐ 1 litre or 100 ml
- ☐ 10^3 cm^3 or 1 litre
- ☐ 100 cm^3 or 1 litre
- ☐ 1000 ml or 10 litre

Q64 Define precipitation in respect to wet chemical analysis?

- ☒ A method of converting ions in solution into an insoluble compound
- ☐ The process of separating solid (crystals or precipitate) from the liquid (mother liquor)
- ☐ A method of reducing the volume of by heating
- ☐ A method of converting water vapour in to liquid water

Q65 What is a mole?

- ☐ The amount of substance which contains as many element as there are atoms in 12 g carbon 12
- ☐ The amount of substance which is contain in a solution
- ☐ The amount of substance equivalent to carbon 12 atom present in a solution
- ☐ All the options are correct

Q66 Why do we heat precipitates during gravimetric analysis?

- ☐ To obtain a compound of constant composition
- ☐ To increase the solubility of the precipitates
- ☒ To dry the precipitates
- ☐ To speed the reaction rate of the precipitates

Q67 The Avogadro number 6.02×10^{23} is equivalent to?

- ☐ Number of atoms, ions or molecules in a mole
- ☐ Number of mole of an atom equivalent to carbon atom
- ☒ Number of elementary units in a mole of a substance
- ☐ All options above are correct

Q68 Choose from the list of chemicals given and determine which has negative effect on skin?

- ☐ Tetraoxosulphate(VI) and hydrogensulphide
- ☐ Esters and ethanols
- ☐ Benzene and benzoylchloride
- ☒ Phenols and hydrogenfluoride

Q69 Calculate the molar mass of 1 mole of a pure substance weighting X g?

- ☐ $M = 2X \text{ g mol}^{-1}$
- ☐ $M = 1/X \text{ g mol}^{-1}$
- ☒ $M = X \text{ g mol}^{-1}$
- ☐ $M = 1 \text{ g mol}^{-1}$

Q70 Which of these hazardous chemicals are likely to cause dizziness and are carcinogenic?

- ☐ Ethanol
- ☒ benzene
- ☐ Silvernitrate
- ☐ Phenol

Q71 Calculate the mass of 0.5 moles of water?

- ☒ 9.408 g
- ☐ 18.016 g
- ☐ 18.071 g
- ☐ 4.504 g

Q72 The hazardous effect of chlorinated alkanes is?

- ☐ Highly oxidizing
- ☐ irritant

- ☐ Skin burns
- ☐ Causes mental confusion

Q73 Calculate the number of moles in 24 g of oxygen gas?

- ☐ 281 mol
- ☐ 265 mol
- ☐ 7.8 mol
- ☐ 3.8 mol

Q74 All are laboratory safety tips except?

- ☐ Wearing lab coat or apron
- ☐ Close all windows and doors
- ☐ Never work alone in the laboratory
- ☐ Be familiar with the position of some safety equipment

Q75 Calculate the molar mass of a pure substance if 2 moles of the substance has a mass of 35 g?

- ☐ 17.5 g mol^{-1}
- ☐ 70 g mol^{-1}
- ☐ 35 g mol^{-1}
- ☐ 37 g mol^{-1}

Q76 Qualitative analysis helps in determining what in a given solution?

- ☐ How long it will take for reactant to react to form products
- ☐ How much of a component is present in that solution
- ☐ The quantity of the solvent required to form solution with the component
- ☐ What type of component is present in that solution

Q77 Define molality of a solution?

- ☐ Weight in grams of a substance per formula weight in kilograms of that substance
- ☐ The number of moles of solute per dm^3 of a solution
- ☐ The number of moles of solute in one kilogram of solution
- ☐ Moles of solute per volume of solution express in litre

Q78 Quantitative methods help in determining what in a solution?

- ☐ How much of a component is present in the solution
- ☐ What type of component is present in a solution
- ☐ The quantity of a solvent required to form a solution with the component
- ☐ How long will take for reactant to react in order to form products

Q79 Normality can be defined as?

- ☐ Moles of solute in 1 dm^3 of solution
- ☐ Weight in gram of a substance per formula weight in kilo gram of substance
- ☐ Number of gram equivalent weight of a solute in one litre of solution
- ☐ All the options are correct

Q80 The various method of quantitative analysis include?

- ☐ Acid base titration and Oxidative analysis
- ☐ Gravimetric, spectrophotometric and volumetric methods
- ☐ Titration, Gravimetric, and Volumetric
- ☐ Spectrophotometric, Oxidative and Neutralization methods