

Model Viva Questions Chemistry Lab

Common to : CS, IT, ET 1st Sem

Title of the practical: Identification of two cations and two anions in a sample of mixture.

Q1: What is qualitative analysis?

A1: The type of analysis that deals with the methods which are used to determine the constituents of a compound.

Q2: What is a radical?

A3: A radical may be defined as an atom or group of atoms which carries charge and behaves as a single unit in chemical reaction.

Q3: What are acidic and basic radicals?

A3: Radicals carrying positive charge are called basic radicals and those carrying negative charge are called acidic radicals.

Q4: What type of bond is present in an inorganic salt?

A4 : Electrovalent type of bond is present in an inorganic salt.

Q5: Name the acid radicals detected with dil. H_2SO_4 ?

A5: CO_3^{2-} , S^{2-} , SO_3^{2-} , NO_2^-

Q6: Name the acid radicals detected by Conc., H_2SO_4

A6: Cl^- , Br^- , I^- , NO_3^- , CH_3COO^-

Q7: Name the radicals which are tested with the help of sodium carbonate extract?

A7: S^{2-} , Cl^- , Br^- , I^- , PO_4^{3-} , SO_4^{2-} , SO_3^{2-}

Q8: Name the radical which produce CO_2 on heating.

A8: Carbonate.

Q9: Name the salts which produce crackling sound when heated?

A9: Lead nitrate, Barium nitrate, Potassium bromide, Sodium chloride.

Q10: What is lime water?

A10: Solution of $Ca(OH)_2$ in water is called lime water.

Title of the practical: To determine the percentage of copper in a given sample of brass.

Q1: What is brass.

A1: Brass is an alloy of copper and zinc.

Q2: Give the chemical composition of brass.

A2: The composition of the brass is Copper (60 to 80 %) and Zinc (20 to 40%) along with small amount of lead (0-2%) tin (0 to 6%) and Iron (0-1%).

Q3: What is normality?

A3: The fraction of gram equivalent of the substance dissolved per litre of the solution is known as normality.

Q4: What is standard solution?

A4: Standard solution is that whose strength is known.

Q5: By which method we determine the percentage of copper?

A5: We determine the percentage of copper by iodometrically.

Q6: What is Iodometric Titration?

A6: Volumetric analysis in which iodine is liberated during a chemical reaction from KI is known as iodometric Titration.

Q7: What is titration.

A7: Titration is a process in which the concentration of unknown solution is determined with the help of a standard solution and indicator.

A8: Titration is mainly of four type:-

- (i) Acidimetry and alkalimetry.
- (ii) Redox titration.
- (iii) Iodometry and iodimetry.
- (iv) Precipitation.

Q9: What is end point?

A9: When the reaction of two solution is completed that point is known as end point.

Q10: 10 Give the types of indicators.

A10: Indicators of three types:-

- i) Internal indicator
- ii) External indicator
- iii) Self indicator.

Title of the practical: To determine the percentage of iron in a iron salt by redox titration.

Q1: What are redox titration?

A1: Reactions which involve simultaneous oxidation and reduction are called redox reactions and the titration involving redox reactions are called redox titration.

Q2: What is self indicators?

A3: When one of the reactants itself acts as indicator and no external substance is required to indicate the end point of titration.

Q3: What is permangnometry?

A3: Redox titrations involving KMnO_4 as the oxidizing agent are called permagnometry.

Q4: Why KMnO_4 solution is kept in dark or coloured bottle.

A4: Because in presence of sunlight, KMnO_4 disintegrates.

Q5: In which terms we express the percentage of Iron?

A5: Percentage of Iron is expressed in terms of grams.

Q6: What is titration?

A6: The process of adding one solution from the burette to another in the titration flask in order to complete the chemical reaction involved is known as titration.

Q7: What is indicator?

A7: Indicator is a chemical substance which changes colour at the end point.

Q8: What is end point?

A8: The stage during titration at which the reaction is just complete is known as the end point of titration.

Q9: What is acidimetry and alkalimetry?

A9: It is the branch of volumetric analysis involving chemical reaction between an acid and a base.

Q10: Why the last drop of solution must not be blown out of a pipette?

A10: Since the drops left in the jet and is extra of the volume measured by the pipette.

Title of the practical: Measurement of pH of different solutions.

Q1: What is pH?

A1: The pH of a solution is the negative logarithm of the hydrogen ion concentration.

$$\text{pH} = \log_{10} (\text{H}^+)$$

Q2: What is the effect of temperature on pH?

A2: The pH value of the solution increases with increase of temperature.

Q3: What is the pH of pure water at 25°C?

A3: 7

Q4: What is effect of dilution on pH of an acidic solution?

A4: pH increases toward 7.

Q5: What does pH of a solution signify?

A5: It signifies the H_3O^+ ion concentration in moles per litre.

Q6: What does pH of a solution if it is acidic?

A6: pH of an acidic solution is less than 7.

Q7: What is an acid-base indicator?

A7: An acid-base indicator is an organic compound which changes its colour within certain pH range.

Q8: What is ionic product of water?

A8: $K_w = [\text{H}_3\text{O}^+] [\text{OH}^-]$

Q9: What do you mean by universal indicator?

A9: It is a mixture of several indicators having different pH ranges.

Q10: Does addition of a salt having a common ion on to weak acid change the pH of the solution?

A10: Yes, the change the pH of solution increases.

Title of the practical: To find out the hardness of water by EDTA method.

Q1: What is the trade name of EDTA?

A1: Ethylene diamine Tetra Acetic Acid. (EDTA).

Q2: What is hardness of Water?

A2: The property of water which restricts or checks the lather formation with soap is called hardness.

Q3: What is temporary or carbonate hardness?

A3: It is caused by the presence of carbonate, mainly bicarbonates of calcium and magnesium.

Q4: What is permanent or non carbonate hardness?

A4: It is caused by chlorides and sulphates of calcium and magnesium.

Q5: Which indicator is employed in EDTA titrations

A5: Erio Chrome Black – T is used in EDTA titration.

Q6: What are complexometric Titrations?

A6: Titrations depending upon the combination of ions, other than H^+ or OH^{-ions} , to form a soluble slightly dissociated ion or compound are called complexometric titration.

Q7: Name the most important complexing agent employed in complexometric titration.

A7: Ethylene diamine tetra acetic acid. (EDTA).

Q8: How the equivalence point is detected in complexometric titration?

A8: The equivalence point is indicated by the use of metal ion indicator such as Erio Chrome Black-T.

Q9: Which type of Ligand is EDTA?

A9: It serves as a hexadentate ligand and acts as a chelating agent.

Q10: What is a buffer solution?

A10: A buffer solution is defined as a solution which resists its pH value even when small amounts of acid or base are added to it.

Title of the practical: Proximate analysis of coal.

Q1:What do you mean by proximate analysis of coal?

A1: Proximate analysis includes the determination of moisture, volatile matter, ash and fixed carbon.

Q2:Name three fossil fuels?

A2: Coal, petroleum and Natural Gas.

Q3:Name the highest ranking coal. Give its calorific value?

A3: Anthracite, 8650 to 8700 K cal/K.g.

Q4:What is the importance of determination of fixed carbon in coal?

A4: Higher the percentage of fixed carbon, higher the calorific value and better the quality of coal.

Q5:What are the characteristics of a good quality coal?

A5: A good quality coal should contain

1. Low moisture
2. Low Volatile matter
- 3.Low ash content &
- 4 high fixed carbon.

Q6:What is ultimate analysis?

A6: The ultimate analysis includes the estimation of ash C,H,S,N and O.

Q7: What is fixed carbon?

A7: Fixed carbon is a difference figure obtained by deducing the ash from the total non-volatile residue remaining after the volatile matter driven off.

Q8:Name the first stage in the coalification of wood.

A8:Peat

Q9:What is meant by ignition temperature?

A9: The lowest temperature at which the fuel must be pre-heated so that it starts burning smoothly.

Q10:Name the variety of coal used in metallurgy, why?

A10: Anthracite, because it has maximum value of fixed carbon content.

Title of the practical: Find out the flash point / fire of an oils.

Q1:What is fire point of an oil?

A1: The fire point of an oil is the lowest temp. at which it ignites and continues to burn for atleast five seconds.

Q2:What is flash point of an oil?

A2: Flash point is the temperature to which a combustible must be heated to giveoff sufficient vapours to.

Q3:Name the instrument commonly used to measure flash and fire point of lubricants in the laboratory?

A3:Pensky-Mortens apparatus.

Q4:What are the factors affecting the flash and fire point?

A4: The main factors are 1. Presence of moisture 2. Vapour pressure of oil.

Q5:How water is removed from the oil before determining the flash point?

A5: Water is removed by (i) Filtration through suitable filter paper. (ii) Absorption by anhydrous calcium chloride. (iii) Centrifugal action.

Q6:What is meant by freaky flash?

A6: Freaky flash is the production of irregular flashes below the true flash point of an oil due to presence of contamination of oil with small amounts of volatile organic substances.

Q7:What is flammable liquid?

A7: If a liquid is having flash point less than 140⁰ F are called flammable liquid.

Q8: What is combustible liquid?

A8: Combustible liquid have flash point above 140⁰ F.

Q9:What is the main significance of determining the flash and fire point of the Lubricating oil?

A9: Flash and Fire point tells us the maximum temperature upto which a lubricating oil can be used this ensures safety against fire hazard during its use

Q10:What is the effect of moisture on the flash and fire point?

A10: Presence of moisture in the lubricant may increase or decrease the flash point. It is increased when steam prevents vapour from igniting and decreased when steam distillation of low molecular weight constituents present in oil.

Title of the practical: Determination of viscosity by red wood viscometer.

Q1: What is Viscosity?

A1: It may be defined as a measure of the internal resistance to motion of a fluid by reason of the forces of cohesion between molecules.

Q2: How does the viscosity of a liquid vary with temperature?

A2: Viscosity of a liquid decreases with increase in temperature generally for every 1° rise in temperature this viscosity index decreases by 2%

Q3: What is the unit of viscosity?

A3: Poise is the unit of viscosity?

Q4: What is the effect of temperature on viscosity of a gas?

A4: Viscosity of gases increases with rise in temperature.

Q5: What do you mean by the term 'viscous-static'?

A5: Viscous-static is the state of a liquid when its viscosity does not change with rise in temperature.

Q6: What is the significance of viscosity?

A6: Viscosity is the only property of the lubricating oils which determines their performance under the operating conditions.

Q7: How is viscosity index of a lubricating oil improved?

A7: Viscosity index of a lubricating oil is improved by adding linear polymer like polystyrenes, polymethacrylates etc.

Q8: How can oiliness of a petroleum oil be increased?

A8: By adding vegetable oils and higher fatty acids.

Q9: What do you mean by all weather lubricants?

A9: Lubricants with High viscosity index show a very small change in viscosity with change in temperature. Therefore, such lubricants can be used over wide range of temperature and are termed as all weather lubricants.

Q10: What is meant by the term oiliness of a lubricating oil?

A10: It is a measure of capacity of the lubricating oil to stick to the surfaces of machine parts under conditions of heavy pressure or load.

Title of the practical: Determination of calorific value of solid fuel by Bomb Calorimeter

Q1:What is meant by calorific values of a fuel?

A1: It is the total quantity of heat liberated when a unit mass (or volume) of the fuel is burnt completely in presence of sufficient quantity of air or oxygen.

Q2:Which apparatus used to determined the calorific value of solid fuel?

A2: Determination of calorific value of solid fuel is done by Bomb calorimeter.

Q3:In which unit we define the calorific value of fuel?

A3: Calorific value of fuel determined by Cal/gm.

Q4:Which equation determined the water equitable of calorimeter?

A4: Equation $L = \frac{(W+w)(t_2-t_1)}{X}$ cal/gm

X

Q5:Differentiate between solid, liquid and gaseous fuels?

A5: Fuels are normally classified according to the physical state in which they are found in nature. For example coal, petroleum and natural gas are solid, liquid and gas.

Q6:What is calorimetry?

A6: Calorimetry is the science of measuring the heat of chemical reactions or physical changes as well as heat capacity.

Q7:What is exothermic reaction?

A7: Exothermic reaction is the reaction in which heat is generated.

Q8:Why high pressure oxygen is used in Bomb Calorimeter?

A8: There are two reason for using high pressure Bomb calorimeter

- (i) We need enough oxygen for a complete combustion in a very small volume.
- (ii) We want to measure the high calorific value of a fuel.

Q9:What is meant by calorific value of a fuel?

A9: It is the total quantity of heat liberated when a unit mass (or volume) of the fuel is burnt completely in presence of sufficient quantity of air or oxygen.

Q10: What is Bomb Calorimeter?

A10: A Bomb calorimeter is a type of constant volume calorimeter used in measuring the heat of combustion of a particular reaction.

