

Chemistry Practical Viva Questions With Answers

Chemistry Practical Viva Questions With Answers Chemistry Practical Viva Questions with Answers A Comprehensive Guide Chemistry practical exams can be daunting but thorough preparation can significantly reduce anxiety A crucial part of this preparation involves anticipating viva questions the oral examination component where examiners assess your understanding of the procedures observations and underlying chemical principles This article provides a comprehensive overview of common chemistry practical viva questions coupled with clear and concise answers categorized for easier navigation

I Basic Laboratory Techniques Safety

This section covers fundamental procedures and safety protocols every chemistry student should master Questions here often probe your understanding of experimental methodology and safe laboratory practices

1 Q Describe the procedure for preparing a standard solution of a known concentration A Preparing a standard solution involves accurately weighing a known mass of solute dissolving it in a specific volume of solvent usually water using a volumetric flask The steps are

Accurately weigh the required mass of the solute using an analytical balance Record the mass precisely Quantitatively transfer the solute to a clean dry volumetric flask of appropriate volume This means ensuring all solute is transferred without any loss Add a small amount of the solvent to dissolve the solute completely Swirl gently to aid dissolution Carefully fill the flask to the calibration mark with the solvent ensuring the bottom of the meniscus aligns with the mark Stopper the flask and invert it several times to ensure thorough mixing Calculate the concentration of the standard solution using the formula

$$\text{Concentration (mol dm}^{-3}\text{)} = \frac{\text{Mass of solute (g)}}{\text{Molar mass of solute (g mol}^{-1}\text{)} \times \text{Volume of solution (dm}^3\text{)}}$$

2 Q What safety precautions should be taken while handling concentrated acids and alkalis 2 A Concentrated acids and alkalis are corrosive and can cause severe burns Safety precautions include Always wear appropriate personal protective equipment PPE including safety goggles lab coat and gloves Handle acids and alkalis in a well-ventilated area or under a fume hood to prevent inhalation of fumes Add acid to water slowly and cautiously stirring constantly never add water to acid This is to prevent splashing and heat generation Neutralize any spills immediately using appropriate neutralizing agents and follow institutional spill protocols Dispose of waste acids and alkalis according to established safety guidelines

II Titration Techniques and Calculations

Titration is a cornerstone of quantitative analysis Expect detailed questions on the procedure calculations and potential sources of error

3 Q Explain the process of acid-base titration and the indicators used A Acid-base titration involves the gradual addition of a standard solution (titrant) of known concentration to a solution of unknown concentration (analyte) until the reaction is complete typically indicated by a color change The

process involves Preparing the burette with the standard solution ensuring its correctly filled and the initial reading is recorded Pipetting a known volume of the analyte into a conical flask Adding a suitable indicator eg phenolphthalein for strong acidstrong base titrations methyl orange for strong acidweak base titrations Slowly adding the titrant from the burette while constantly swirling the flask The endpoint is reached when the indicator changes color permanently indicating the neutralization point Record the final burette reading and calculate the volume of titrant used

4 Q How do you calculate the concentration of an unknown solution from titration data

A The concentration of the unknown solution can be calculated using the formula $M_1V_1 = M_2V_2$ Where M_1 Molarity of the standard solution known V_1 Volume of the standard solution used from titration M_2 Molarity of the unknown solution to be calculated V_2 Volume of the unknown solution used pipetted This equation is based on the stoichiometry of the reaction between the acid and base

III Qualitative Analysis Inorganic Chemistry Qualitative analysis focuses on identifying the presence or absence of specific ions or compounds Viva questions here often involve the interpretation of observations and reactions

5 Q Describe the tests for identifying chloride sulfate and carbonate ions

A Chloride Cl^- Add dilute nitric acid followed by silver nitrate solution A white precipitate of silver chloride AgCl forms insoluble in dilute nitric acid but soluble in concentrated ammonia solution Sulfate SO_4^{2-} Add dilute hydrochloric acid followed by barium chloride solution A white precipitate of barium sulfate BaSO_4 forms insoluble in dilute hydrochloric acid Carbonate CO_3^{2-} Add dilute hydrochloric acid Effervescence bubbling occurs and the gas produced carbon dioxide CO_2 turns limewater milky

6 Q Explain the flame test and its application in identifying metal ions

A The flame test is a qualitative test used to identify metal ions based on the characteristic color they impart to a flame A clean platinum or nichrome wire is dipped in a solution containing the metal ion then introduced into a Bunsen flame The color observed is specific to the metal ion Sodium Na Yellow Potassium K Lilac Calcium Ca Brick red Copper Cu Green

IV Organic Chemistry Practical Techniques Organic chemistry practical questions frequently assess your understanding of functional group tests and purification techniques

7 Q Describe the tests used to identify alcohols aldehydes and ketones

4 A These tests rely on specific reactions characteristic of their functional groups Alcohols OH Reaction with sodium metal produces hydrogen gas a pop test Oxidation with acidified potassium dichromate VI changes color from orange to green for primary and secondary alcohols aldehydes and ketones are formed Aldehydes CHO Positive Tollens test silver mirror formation and Fehlings test red precipitate of copper(I) oxide Ketones CO Negative Tollens and Fehlings tests They can be identified through iodoform test yellow precipitate

8 Q Explain the process of recrystallization for purifying a solid organic compound

A Recrystallization is a purification technique based on the difference in solubility of the compound at different temperatures The process involves Dissolving the impure compound in a minimum amount of hot solvent Filtering the hot solution to remove insoluble impurities Allowing the solution to cool slowly leading to crystallization of

the pure compound Filtering the crystals and washing them with a small amount of cold solvent Drying the purified crystals V Data Analysis Error Handling A significant portion of the viva might focus on your ability to interpret experimental data identify sources of error and suggest improvements 9 Q How do you identify and minimize systematic and random errors in titration A Systematic errors are consistent and repeatable while random errors are unpredictable In titrations Systematic errors Incorrect calibration of glassware parallax error in reading the burette using an inappropriate indicator Minimization involves careful calibration correct reading techniques and choosing the right indicator Random errors Small variations in temperature slight variations in the endpoint slight inconsistencies in swirling the flask Minimization involves multiple trials averaging results and careful observation Key Takeaways Thorough understanding of laboratory techniques and safety is crucial Mastering titration calculations and qualitative analysis tests is essential 5 Familiarity with organic functional group tests and purification methods is vital Practice interpreting data identifying errors and suggesting improvements Revise the theoretical basis underlying each experiment Frequently Asked Questions FAQs 1 How can I prepare effectively for a chemistry practical viva Review your laboratory manual thoroughly focusing on the procedures and underlying principles Practice writing up reports for experiments including observations calculations and error analysis Anticipate likely viva questions and rehearse your answers This involves understanding the why behind the procedures not just the how Consult with your teacher or peers to discuss potential questions and clarify any doubts 2 What if I make a mistake during the practical exam Dont panic Mistakes happen Acknowledge the mistake explain what went wrong and focus on demonstrating your understanding of the correct procedure Show your problemsolving skills 3 Are there specific books or resources I can use for preparation Your laboratory manual is the most important resource Supplementary textbooks and online resources can provide additional support 4 How much weight does the viva carry in the overall practical assessment The weighting of the viva varies across institutions Check your syllabus or consult your teacher for specific details 5 How can I improve my confidence during the viva Adequate preparation is key to confidence Practice answering questions aloud and if possible get feedback from someone else Remember to breathe deeply and speak clearly during the examination Confidence stems from competence 6

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