

chemistry practical viva questions with answers

Published: September 27, 2026 | Index ID: #-

Introduction

In the world of chemistry, the practical viva is the bridge between theoretical knowledge and real world application. While laboratory reports and written exams assess your ability to record data and apply concepts, the viva tests your depth of understanding, your ability to explain procedures, and your confidence in communicating scientific ideas. For students preparing for their final year examinations, a well structured set of chemistry practical viva questions with answers can be the key to unlocking a high score and building lasting scientific communication skills.

Below, we provide a comprehensive guide that covers why the viva matters, common question themes, a curated list of sample questions with model answers, effective preparation strategies, pitfalls to avoid, and additional resources to help you master the practical viva. Whether you are a first year student getting acquainted with the format or a senior student polishing your technique, this article will give you the tools you need to excel.

Why Chemistry Practical Viva Matters

The viva is more than a routine checkpoint; it is a critical assessment of several competencies:

- **Conceptual Clarity:** Demonstrates your ability to link laboratory observations to underlying chemical principles.
- **Problem Solving:** Shows how you handle unexpected results or troubleshoot experimental errors.
- **Communication Skills:** Highlights your proficiency in explaining procedures, results, and conclusions in a clear, concise manner.
- **Scientific Integrity:** Reinforces the importance of accurate data collection, proper documentation, and ethical conduct.

Because the viva is often the final hurdle before graduation, mastering it can significantly impact your overall marks and confidence in the subject. It also prepares you for future academic or industry roles where you will need to defend experimental designs and interpret results under scrutiny.

Common Themes in Practical Viva Questions

While each institution may tailor its questions, certain themes recur across most practical vivas. Understanding these themes can help you anticipate what to study and how to structure your responses.

- **Experimental Design:** Questions about the rationale behind choosing a particular method, safety precautions, and the selection of reagents.
- **Data Analysis:** Calculations, error estimation, and interpretation of graphs or spectra.
- **Safety and Ethics:** Proper handling of hazardous chemicals, disposal methods, and ethical considerations in experimentation.
- **Instrumentation:** Operation and troubleshooting of analytical instruments such as spectrophotometers, gas chromatographs, or titration setups.
- **Critical Thinking:** Ability to propose alternative methods, identify sources of error, or suggest improvements to the procedure.
- **Application of Theory:** Connecting experimental observations to theoretical concepts like stoichiometry, equilibrium, kinetics, or thermodynamics.

Sample Viva Questions and Model Answers

Basic Questions

Answer: Before titration, I ensure that all glassware is clean and dry, wear appropriate personal protective equipment (lab coat, goggles, gloves), and verify that the titrant and analyte solutions are free from contamination. I also check the burette for air bubbles, set up a spill tray, and confirm that the titrant is correctly labeled. Finally, I perform a quick safety check of the laboratory area, ensuring fire extinguishers and first aid kits are accessible.

Question: Why is it important to use a calibrated pH meter?

Answer: A calibrated pH meter ensures accurate measurement of solution acidity or basicity. Calibration with standard buffers corrects for electrode drift, temperature variations, and ionic strength differences, allowing for reliable data that can be compared across experiments and with literature values.

Question: How do you determine the endpoint in a neutralization titration?

Answer: The endpoint is reached when the indicator changes color, signaling that the stoichiometric amount of titrant has reacted with the analyte. For more precise determination, I use a pH meter to detect the inflection point on the titration curve, ensuring that the reaction is complete and the result is reproducible.

Question: What is the purpose of a blank in spectrophotometry?

Answer: A blank contains all components of the sample except the analyte. It compensates for absorbance due to solvents, cuvettes, or reagents, allowing the spectrophotometer to measure only the analyte's contribution. This ensures accurate concentration calculations using Beer's Law.

Question: Explain the term "stoichiometric ratio" in a chemical reaction.

Answer: The stoichiometric ratio refers to the quantitative relationship between reactants and products as expressed in a balanced chemical equation. It determines how much of each reactant is needed to produce a given amount of product and is essential for calculating limiting reagents and yields.

Intermediate Questions

Answer: Percent error is calculated by dividing the absolute difference between the experimental and accepted values by the accepted value, then multiplying by 100. For example, if the accepted concentration is 0.100 M and the experimental is 0.095 M, the percent error is $|0.100 - 0.095| / 0.100 \times 100 = 5\%$.

Question: What are the advantages of using a magnetic stirrer during a synthesis?

Answer: A magnetic stirrer provides uniform mixing, reduces the risk of localized overheating, and allows for continuous agitation without manual intervention. It also minimizes the chance of splashing or spillage, improving safety and reproducibility.

Question: How would you troubleshoot a gas chromatograph that shows no peaks?

Answer: First, check the carrier gas flow rate and ensure it is within specifications. Verify that the detector is powered and functioning, and that the injection port temperature is appropriate. Confirm that the column is not blocked or degraded, and that the sample injection volume is correct. If all hardware checks out, test with a known standard to isolate the issue.

Question: Explain the concept of an equilibrium constant (K_c) and how it relates to reaction direction.

Answer: The equilibrium constant K_c quantifies the ratio of product concentrations to reactant concentrations at equilibrium, each raised to the power of their stoichiometric coefficients. If $K_c > 1$, the equilibrium lies toward products; if K_c

Question: What is the purpose of a standard curve in analytical chemistry?

Answer: A standard curve plots known concentrations of an analyte against measured instrument responses (e.g., absorbance). It allows for interpolation of unknown concentrations from their measured responses, ensuring accuracy and traceability in quantitative analysis.

Advanced Questions

Answer: Factors include catalyst surface area (larger area increases active sites), temperature (higher temperatures accelerate adsorption and desorption steps), reactant concentration (affects collision frequency), pressure (for gas phase reactions), and the presence of poisons or inhibitors that can occupy active sites. The catalyst's electronic properties and the nature of the reactants also play critical roles.

Question: How do you determine the molar absorptivity (ϵ) of a compound?

Answer: Prepare a series of solutions with known concentrations of the compound. Measure the absorbance at a wavelength where the compound absorbs maximally. Plot absorbance (A) versus concentration (c) to obtain a straight line; the slope of this line equals $\epsilon \cdot l$. Assuming a 1 cm cuvette, $\epsilon = A/c$.

Question: Explain the role of a buffer solution in maintaining pH during a biochemical assay.

Answer: A buffer resists changes in pH by providing a reservoir of conjugate acid and base pairs. In biochemical assays, many enzymatic reactions are pH dependent; a stable pH ensures consistent activity, accurate kinetics, and reliable interpretation of results. The buffer's capacity must match the expected proton load during the assay.

Question: Describe how to calculate the Gibbs free energy change (ΔG) for a reaction at a given temperature.

Answer: ΔG can be calculated using the equation $\Delta G = \Delta H - T\Delta S$, where ΔH is enthalpy change, ΔS is entropy change, and T is absolute temperature in Kelvin. Alternatively, ΔG can be derived from the equilibrium constant using $\Delta G = -RT \ln K$, with R being the gas constant. Both approaches yield the same result if thermodynamic data are accurate.

Question: What are the advantages and limitations of using a cryogenic trap in gas chromatography?

Answer: Advantages include efficient condensation of volatile analytes, reducing detector noise and improving sensitivity for low concentration compounds. Cryogenic traps also protect the column from contaminants. Limitations involve the need for a cooling system (e.g., liquid nitrogen), potential sample loss if the trap is not properly maintained, and increased operational complexity.

Effective Preparation Strategies

- Review the Lab Manual: Revisit every procedure, noting key steps, critical observations, and safety requirements. Highlight areas where you felt uncertain during the experiment.
- Practice Explaining: Use a mirror or a peer to rehearse concise explanations of each step, the rationale behind reagent choices, and the expected outcomes. Focus on clarity and logical flow.
- Develop a Cheat Sheet: Summarize formulas, common errors, safety guidelines, and instrument settings. Keep it brief so you can quickly reference it during practice sessions.
- Simulate the Viva: Record yourself answering sample questions. Play back the recording to evaluate pronunciation, pacing, and content accuracy.

- Engage in Group Discussions: Discuss experimental challenges with classmates. Explaining concepts to others reinforces your own understanding and exposes gaps you may have overlooked.
- Seek Feedback: Ask your laboratory instructor to review your answers or conduct a mock viva. Constructive criticism is invaluable for refining your communication style.
- Time Management: Allocate a specific time slot for viva practice each day leading up to the exam. Consistent, focused practice builds muscle memory and confidence.

Common Mistakes to Avoid

Baca Juga (Artikel Terkait)

- [chemistry matter and change chapter 6 answers](http://www.bbgglobalsolutions.com/chemistry-matter-and-change-chapter-6-answers.pdf)

URL: <http://www.bbgglobalsolutions.com/chemistry-matter-and-change-chapter-6-answers.pdf>

- [chemistry matter and change chapter 5 answers](http://www.bbgglobalsolutions.com/chemistry-matter-and-change-chapter-5-answers.pdf)

URL: <http://www.bbgglobalsolutions.com/chemistry-matter-and-change-chapter-5-answers.pdf>

- [chemistry note for iit jee](http://www.bbgglobalsolutions.com/chemistry-note-for-iit-jee.pdf)

URL: <http://www.bbgglobalsolutions.com/chemistry-note-for-iit-jee.pdf>

- [chemistry nelson alberta 20 30 answer](http://www.bbgglobalsolutions.com/chemistry-nelson-alberta-20-30-answer.pdf)

URL: <http://www.bbgglobalsolutions.com/chemistry-nelson-alberta-20-30-answer.pdf>

Tags: [#chemistry](#) [#practical](#) [#viva](#) [#questions](#) [#with](#) [#answers](#)

