

SHREE H.N SHUKLA INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH



Question Bank

B.PHRAM

(SEMESTER –I)

SUBJECT NAME: PHARMACEUTICAL ANALYSIS - I

SUBJECT CODE: BP102TP

UNIT 1- PHARMACEUTICAL ANALYSIS

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| 1 | Write a brief note on different techniques of analysis. |
| 2 | Give detail note on scope of pharmaceutical analysis. |
| 3 | Write a methods of expressing concentration in detail. OR Explain following terms: (i) Molarity (ii) Molality (iii) Normality (iv) Formality (v) Parts per million (ppm) (vi) Mole fraction |
| 4 | Why standardization is required? Give detail notes on primary standard and Secondary Standard. |
| 5 | Write the principle involved in standardization of sodium thiosulphate. |
| 6 | Explain accuracy and precision in detail. |
| 7 | Explain the following terms: (i) Primary Standard (ii) Secondary Standard (iii) Accuracy (iv) Precision (v) Pharmacopoeia (vi) Significant figures |
| 8 | Define error. Classify the error and give the methods for error minimization. |
| 9 | Give detail note on Pharmacopoeia. |
| 10 | Discuss various sources of impurities in medical agents. |
| 11 | Explain the limit test for Arsenic. |
| 12 | Explain following terms: (i) Titration (ii) Visual end point (iii) Theoretical end point (iv) Standardization |
| 13 | COMMENT: Small amount of sodium carbonate or borax is added in preparation of sodium thiosulphate solution. |

UNIT 2

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| A. | ACID-BASE TITRATION |
| 1. | Explain Acid-Base Theories. |
| 2. | Explain in detail theories of acid- base indicators. |
| 3 | Enlist end point detection method in acid base titration and explain resonance theory. |

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| 4 | What is buffer solution? Derive Henderson Hasselbach equation for finding pH of buffer solution? OR Derive the equation for calculating pH of buffer solution. |
| 5 | Explain the types of acid-base titration. (Alkalimetry & Acidimetry) |
| 6 | Define Hydrolysis and derive equation for finding pH of aqueous solution of acetic acid with ammonium hydroxide. |
| 7 | What is hydrolysis? Derive equation for finding pH of aqueous solution of salt of strong acid and weak base. |
| 8 | Explain the hydrolysis of salts obtained from Weak Acid and Strong Base. |
| 9 | Explain neutralization curve for weak acid and strong base. |
| 10 | Explain neutralization curve for strong acid and strong base. |
| 11 | Explain neutralization curve for weak acid and weak base. |
| 12 | Explain : (1) Common ion effect (2) Buffer Capacity (3) Calibration (3) Buffer |
| 13 | COMMENT (i) Phenolphthalein gives colour in basic media (ii) Methyl orange gives colour in basic media. |

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| B. | NON-AQUEOUS TITRATION |
| 1 | What is non-aqueous titration? Write a brief note on types of non-aqueous solvents. Explain leveling and differentiating effect of solvent with example? |
| 2 | What is non aqueous titration? Give merits (advantages), demerits (disadvantages) and application of non-aqueous titration. |
| 3 | Solvents used in non-aqueous titration. |
| 4 | Write a brief note on non-aqueous titrations. |
| 5 | COMMENT: (i) Water is differentiating solvent for HCl and CH ₃ COOH. (ii) Acetic acid is a leveling solvent as well as differentiating solvent. (iii) Acetic acid is added in preparation of perchloric acid. (iv) Acetic Anhydride is added with acetic acid using as a non-aqueous solvent. |

UNIT 3

| A. PRECIPITATION TITRATIONS | |
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| 1 | Write is precipitations titration? Write a note on factors affecting precipitations titrations? OR Write a note on factors affecting solubility of precipitates. |
| 2 | Explain in detail Mohr's method. (Argentometric Direct titration) OR How will you determine halogen by Mohr's method? |
| 3 | Write a note on Volhard's method of Precipitation titration. (Argentometric Back titration) |
| 4 | Define precipitation titration. Explain the Fajan's method used for detection of end point in precipitation titration. (Adsorption indicator method) |
| 5 | Discuss the principle involved in estimation of sodium chloride (NaCl). |
| 6 | COMMENT: (i) Nitrobenzene is used in Volhard's Method (ii) Mohr's titration is carried out in acidic media. (iii) Volhard's method is carried out in acidic media. (iv) Ba(NO ₃) ₂ is added in non-precipitation (Turbidity method) of sodium chloride. |
| 7 | The K _{sp} of AgCl is 1.0×10^{-10} . Calculate molar solubility of AgCl. |
| 8 | Calculate the solubility product of MgCO ₃ if 1 liter of its standard solution contains 0.533 gm. of MgCO ₃ at 20° C. (mol. Wt of MgCO ₃ = 84.32) |
| 9 | Calculate the solubility of Mg(OH) ₂ in mg per liter of K _{sp} (Mg(OH) ₂) is 6×10^{-10} . Molecular weight of Mg(OH) ₂ is 58.33. |

| B. COMPLEXOMETRIC TITRATION | |
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| 1 | Write the principle used behind complexometric titration? Define Ligands and classify it. |
| 2 | Write a short note on (I) Masking and Demasking reagents (II) pM indicators. |
| 3 | Define metal ion indicator. What are the ideal requirements of metal ion indicator? |
| 4 | Di9fferentiate: Masking and demasking agents. |
| 5 | Define Ligand and Chelate. Give an account of different types of EDTA titrations. |
| 6 | Enlist different types of EDTA titration and explain any two of them using suitable examples |

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| 7 | Explain ligand and sequestering agent. Write note on replacement titration. |
| 8 | Discuss the principle involved in the assay of Calcium Gluconate. |
| 9 | Discuss the principle involved in the assay of magnesium sulphate. |
| 10 | COMMENT: EDTA is used as a chelating agent in complexometric titrations. |

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| C. | GRAVIMETRY |
| 1 | What is gravimetric analysis? Discuss steps involved in gravimetric analysis. |
| 2 | What is gravimetric analysis? Explain advantage, disadvantage and application of gravimetric analysis. |
| 3 | Enlist types of Co-precipitation and add a note on common source of co-precipitation. |
| 4 | Give account of co-precipitation and methods for minimization of co-precipitation. |
| 5 | Explain – (i) Co-precipitation (ii) Post-precipitation (iii) Ostwald ripening (Digestion) |
| 6 | COMMENT: Electrolyte solution is used for wash precipitate. |

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| D. | DIAZOTISATION TITRATION |
| 1 | Discuss in detail about Diazotization titration. OR Explain sodium nitrite titration. |

UNIT 4: REDOX TITRATIONS

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| 1 | What is redox titration? Explain redox indicators. |
| 2 | Define oxidizing agent and reducing agent and explain redox indicator in detail. |
| 3 | Write a detailed note on end point detection method for redox titration? |
| 4 | Enlist types of redox titration and explain iodine titration in detail. |
| 5 | Differentiate iodometry and iodimetry. |
| 6 | Enlist types of redox titration and explain titration with $K_2Cr_2O_7$ in detail. |
| 7 | Enlist types of redox titration and explain any two in detail. |
| 8 | Enlist types of redox titration. Write a note on permanganatometry (Titration with $KMnO_4$) |
| 9 | COMMENT: (i) Starch indicator should be added near the end point in iodine titration. |

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| | (ii) Starch paste should be freshly prepared. (iii) Equivalent weight of KMnO_4 is change with media. |
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UNIT 5: ELECTROCHEMICAL METHODS OF ANALYSIS

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| A. | CONDUCTOMETRY |
| 1. | Explain principle of conductometry. |
| 2. | Describe factors affecting on conductance. |
| 3. | Write a short note on various types of conductometric titration. |
| 4. | Give advantages, disadvantages and application of conductometry. |

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| B | POTENTIOMETRY |
| 1 | Enlist different reference electrode used in potentiometer and explain any one in detail. |
| 2 | Define Reference electrode. Enlist types of it and write a note on Normal Hydrogen Electrode (NHE). |
| 3 | Define Reference electrode. Enlist types of it and write a note on Saturated Calomel electrode (SCE). |
| 4 | Define Indicator electrodes. Enlist types of it and explain glass electrode in detail. OR Write a principle, construction, working and limitations of Glass Electrode. |
| 5 | Write a note on indicator electrodes. |
| 6 | Explain instrumentation of potentiometer and methods to determine end point of potentiometric titration. |
| 7 | Give applications of potentiometric titration. |

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| C. | POLAROGRAPHY |
| 1 | Write a note on dropping mercury electrode (DME). OR Write a construction and working of dropping mercury electrode (DME). |

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| 2 | Write a construction and working of rotating platinum electrode. |
| 3 | State the Ilkovic equation and explain the factors affecting it. |
| 4 | Explain the principle involved in polarographic technique and explain its instrumentation. |