

Посветени на хуманността

МЕДИЦИНСКИ УНИВЕРСИТЕТ – ПЛОВДИВ

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PROGRAMME IN ANALYTICAL CHEMISTRY COURSE, I year, II semester, 2023/2024

| Chapters | Hours |
|--|-------|
| Chapter 1. The nature of Analytical Chemistry. The role of analytical chemistry in modern science. Key terms. Classification of analytical techniques. Analytical process – steps. | 2 |
| Chapter 2. Units, Concentration and Stoichiometry. Some important units of measurement. Solutions and their concentration. Chemical stoichiometry. Significant figures. | 3 |
| Chapter 3. Errors, Random Errors and Statistical Data in Chemical Analyses. | 3 |
| Chapter 4. Chemical equilibrium. The law of mass actions. Equilibrium constants. Activity. Ionic strength. Equilibrium constants. Important equilibria in analytical chemistry. | 2 |
| Chapter 5. The chemical composition of aqueous solutions. Acid-base equilibrium. Brønsted-Lowry theory. Acid and base ionization constants. Water autoionization constant; pH and pOH. pH calculations using acid/base dissociation constants. Acid-base properties of salt solutions. Buffer solutions. | 6 |
| Chapter 6. Volumetric methods of analysis – definitions, classification, calculations and application. Advantages and disadvantages of volumetric analysis. | 3 |
| Chapter 7. Principles of neutralization titrations in aqueous solutions – solutions and indicators; titrations based on acid–base reactions (strong acid/strong base, strong base/strong acid, weak acid/strong base, weak base/strong acid, polyprotic acids). Application. Advantages and disadvantages. | 5 |
| Chapter 8. Acid-base equilibrium in non-aqueous media. Classification of solvents. Strengths of acids and bases. Levelling and differentiating effects. Titrations based on acid–base reactions in non-aqueous solvents. Selecting and evaluating the end point. Characterization. Application. Advantages and disadvantages. | 2 |
| Chapter 9. Precipitation equilibrium. Basic terms. Solubility and solubility product constant. Factors affecting solubility. Importance of solubility equilibrium. | 2 |
| Chapter 10. Precipitation titrations – principle. Argentometry – standard solutions, titration curves, end point detection, methods of titration. Application. Advantages and disadvantages. | 2 |

January 29, 2024

Lecturer:

/Assoc.Prof. Z. Velkova, PhD/

Head of Department:

/Prof. K. Gavazov, PhD/