

PHC 261: PHARMACEUTICAL ANALYTICAL CHEMISTRY-I (2 + 1)

Prereq. Chem. 108 or 105 + 106

Course Description

The course presents fundamental concepts and applications of volumetric analysis based on acid-base, precipitation, complexation and redox reaction. In addition on introduction to gravimetric analysis is given.

Theoretical	<u>No. of Lectures</u>
Acid-base titrations	5
-Basic concepts and pH calculation. -Dissociation of weak acids and bases. -pH of salts. -Buffers and buffer capacity.	
-Titration curves. -Indicators. -Application to pharmaceutical analysis.	2
Non-aqueous titrations	2
-Principles. -Solvents. -Solvents of organic acids - weak bases - weak base halogen salts - weak acids. -Application to pharmaceutical analysis.	
Precipitation titrations	4
-Solubility product, common ion - complex ions. -Mohr, Volhard, & Fajans methods. -Leibig's methods and its modifications, mercurimetry. -Application to pharmaceutical analysis.	
Complexometric Titrations	4
-Chelating agents and chelate compounds. -Complexometric titration curves. -PM - indicators. -Methods of EDTA-titration. -Masking and demasking.	

Theoretical	<u>No. of Lectures</u>
Redox reactions	5
-Oxidation reduction reactions.	
-Potential measurements.	
-KMnO ₄ in acid, neutral, alkaline media.	
-K ₂ Cr ₂ O ₇ , Ce ⁴⁺ ,	
-I ₂ /I ⁻ system.	
-KIO ₃ - Andrew's method.	2
-Hypoiodide.	
-Sodium nitrite titrations.	
-Br ⁻ /BrO ₃ ⁻ system.	
-Application to pharmaceutical analysis.	
Gravimetry	2
-Introduction, precipitation.	
-Co-precipitation and post-precipitation.	
-Application to pharmaceutical analysis.	
Examination	2
	<hr/> Total 28 <hr/> =====

PHC 261: PRACTICAL

Lab. No.

Acid-base titrations

1 & 2 **Standardization of N/2 HCl (using primary standard Na₂CO₃).**

Standardization of NaOH.
Determination of boric acid.
Determination of borax.
Determination of mixture of boric acid and borax.
Determination of ammonium chloride (formol titration).
Determination of acetylsalicylic acid (Aspirin).
Assay of ammoniated mercury.
Assay of sodium benzoate.
Assay of oxyphenbutazone tablets.

3 & 4 **Non-aqueous and diazometric titrations**

Standardization of acetic perchloric acid.
Determination of Adrenaline.
Determination of glaphenine HCl.
Determination of benzoic acid.
Assay of paracetamol tab.
Assay of sulphaguanidine tab.
Assay of chloramphenicol caps.

5 & 6 **Precipitometric and complexometric titrations**

Standardization of N/10 AgNO₃.
Standardization of N/10 amm. thiocyanate.
Determination of NH₄Cl by Volhard's method.
Determination of NH₄Cl by Fajans' method.
Mercurimetric determination of chloride.
Mercurimetric determination of I.
Standardization of M/20 EDTA.
Determination of hardness of water (Ca⁺⁺ and Mg⁺⁺).
Determination of Ca. gluconate.
Precipitation (chloral hydrate draught).
(a) for chloral hydrate.
(b) for pot. bromide.
Determination of chlorobutol.
Determination of zinc oxide.

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Practical examination

Lab. No.

8 & 9 **Redox titrations**

Standardization of N/10 KMnO_4 solution.
Standardization of N/10 iodine.
Assay of Vit. C tab.
Bromometric determination of Aspirin.
Assay of phenazone powder.
Assay of ferrous gluconate by amm. ceric SO_4 .
Assay of ferrous gluconate by potassium dichromate.
Assay of ferrous gluconate by KMnO_4 .
Determination of glycerol.

10 & 11 **Redox titrations**

Determination of hydrogen peroxide.
Determination of formic acid.
Determination of calcium lactate.
Assay of isoniazid tablets.
Determination of iodide (Andrew's method)
Determination of glucose by IO^- (hypoiodite).
Determination of phenol.
Prescription: Iodo-salicylic acid.
(a) for iodine.
(b) for salicylic acid.

12 & 13 **Gravimetry**

Determination of Ca^{++}
Determination of piperazine.

14 **Practical exam**

14 Total