ORGANIC CHEMISTRY CURRICULUM CONTENT FOR COLLOQUIA

2nd year, field of study - Pharmacy

Colloquium I (max 20 credits) - chemistry glassware and equipment types, names and uses, methods of purification of organic compounds (distillation: simple, fractional, reduced pressure, steam; sublimation; extraction; crystallisation), techniques for heating, cooling and drying substances, melting, boiling and refractive index measurement techniques, health and safety rules, chemical calculation (reaction yields, concentration).

Colloquium II (max 25 credits) - methods of synthesis hydrocarbons (alkanes, unsaturated hydrocarbons, cycloalkanes, arenes) and alkyl and aryl halides. Physical and chemical properties (reactions + reaction mechanisms). Methods of identification hydrocarbons and halogenated derivatives - qualitative analysis.

Colloquium III (max 20 credits) - alcohols, phenols, ethers, sulphonic acids, nitro compounds – synthesis methods, physical and chemical properties (reactions + mechanisms). Methods for the identification of alcohols, phenols, ethers, sulphonic acids - qualitative analysis.

Colloquium IV (max 20 credits) - aldehydes, ketones - preparation and physical properties. Nucleophilic addition to aldehydes and ketones (mechanism). Aldol condensation, Cannizzaro reaction, oxidation and reduction. Methods of identification of aldehydes and ketones - qualitative analysis.

Colloquium V (max 20 credits) - physical properties, nomenclature of amines and their reactions. Diazonium salts synthesis, diazo group exchange reactions - qualitative analysis. Dyes - methods of synthesis (among others: chrysotile, 2-naphthol orange, methyl orange, Congo red, indigo, indigo white, phenolphthalein, malachite green and crystal violet.. Relationship between colour and structure of an organic compound.

Colloquium VI (max 20 credits) - obtaining, nomenclature and chemical properties of carboxylic acids, hydroxy-, amino-, halogenated and oxoacids, esters, acyl chlorides, amides, acid anhydrides. Dicarboxylic acids. Reaction mechanism of esterification in acidic and basic media. Claisen condensation. Lipids. Syntheses using malonic and acetylacetic esters.

Colloquium VII (max 20 credits) - Heterocyclic mono- and polycyclic compounds with one and multiple heteroatoms. Nomenclature, methods of synthesis and chemical properties (reactivity).

Colloquium VIII (max 20 credits)
Monosaccharides: D and L formulae of sugars: glucose, galactose, mannose, ribose, arabinose, fructose, isomerism of monosaccharides (relative and absolute configuration) ring forms of sugars, anomers, mutation characteristic reactions (oxidation, reduction, reduction with phenylhydrazine, chain elongation and shortening, enolisation, epimerisation.

Disaccharides: structure of lactose, maltose, cellobiose, sucrose, trehalose, reducing properties of disaccharides, glycosides

Polysaccharides: structure and properties of cellulose, starch and glycogen, nucleotide bases present in nucleosides (formulae, tautomerism), nucleosides, nucleotides and nucleic acids - structure and significance.