
Topics of the Medical Chemistry semester exam

2021/2022. 1st semester

UNIVERSITY OF PÉCS

Medical School, Department of Biochemistry and Medical Chemistry



General, inorganic and physical chemistry

1. The composition and electron configuration of the atoms. The periodic table of elements.
2. Primary chemical bonds
3. Molecular structure. Intermolecular (van der Waals) forces, secondary chemical bonds.
4. The solid state. Types and properties of various lattices in the solid state.
5. The liquid state.
6. The gaseous state. Gas laws.
7. Phase changes, phase diagram.
8. Water and the aqueous solutions, solubility.
9. Laws concerning dilute solutions (colligative properties).
10. Colloid systems.
11. Homogeneous equilibria, electrolytic dissociation.
12. Heterogeneous equilibria, partition.
13. Acids, bases, salts, amphoterism, hydrolysis of salts.
14. Coordination compounds (complexes).
15. Thermochemistry, Hess' law, endothermic and exothermic processes, entropy.
16. Thermodynamics, exergonic and endergonic processes.
17. Reaction kinetics.
18. Concept, formation and properties of acids, bases, anhydrides, acid residues.
Composition of salts. Basic reaction types in inorganic chemistry.
19. Characterization of nonmetals with biochemical or medical importance.
20. Characterization of metals and semimetals with biochemical or medical importance.

Analytical chemistry

21. Basic concepts in analytical chemistry.
22. Composition of solutions, concentration units.
23. Light absorption, spectrophotometry
24. Osmosis, osmolarity.

25. pH and pOH in strong and in weak acids/bases.
26. Buffer solutions.
27. Electrochemistry.
28. Determination of pH, acid-base indicators
29. Quantitative and qualitative analysis
30. Chromatography

Organic chemistry

31. Constitutional and conformational isomerism.
32. Geometrical isomerism.
33. Chiral compounds, optical isomerism.
34. Saturated hydrocarbons (alkane, cycloalkanes).
35. Unsaturated hydrocarbons (alkenes, alkynes).
36. Dienes, polyenes, aromatic compounds.
37. Organic halogen compounds.
38. Alcohols, enols.
39. Phenols, quinones.
40. Ethers, sulfur containing organic compounds.
41. Oxo-compounds.
42. Carboxylic acids.
43. Dicarboxylic acids, hydroxy- and oxocarboxylic acids.
44. Organic and inorganic esters, thioesters.
45. Carboxylic acid derivatives (salts, amides, anhydrides)
46. Amines.
47. Compounds with high-energy (macroerg) bonds