



University of Szeged, Faculty of Pharmacy
Department of Pharmaceutical Technology
H-6720 Szeged, Eötvös u. 6., Hungary
Head: Prof. Dr. habil. Piroska Szabó-Révész
Tel.: (36) 62-545-572, Fax: (36) 62-545-571
e-mail: revesz@pharm.u-szeged.hu
www.pharm.u-szeged.hu/phtech



Terminal examination (SEMI-FINAL), 2012/2013
Comprehensive topics, principle of operations and methods

1. Process of production of active agents. The rule of the quality of active agents in the development of dosage forms.
2. Definition of excipient, vehicle, base in according to Ph. Hg. VIII. Grouping of excipients.
3. Biopharmaceutical aspects of formulation. LADMER, ADMER, relative and absolute bioavailability.
4. Biopharmaceutical Classification System (BCS). Generational grouping of dosage forms.
5. Preformulation and formulation in the design of dosage forms. Factorial design and neural networks.
6. Research, development and production. Patents in the pharmaceutical industry.
7. Brand name drugs and generics. Process of development of new pharmaceuticals into medical preparations.
8. Preparation of medicines in industry, laboratory and pharmacy. Critical factors of quality of preparations.
9. Instrumentation of technological procedures. Principles of automatization.
10. Definition of rheology. Deformation processes and application in pharmaceutical technology. Basic quantity and functions of rheology. Grouping of rheological phenomena (types of deformation).
11. Definition, characterization and stability of dosage forms belong to disperse systems.
12. Definition, characterization and stability of dosage forms belong to coherent systems.
13. Interfacial phenomena. Adsorption. Adhesion, bioadhesion. Surface and interfacial tension. Contact angle, surface free energy.
14. Definition, grouping, structure and solubility of polymers. Intelligent or stimulus-sensitive polymers.
15. Distillation, ion-changing and reverse osmosis. Desalting of sea water. Purified waters in the Pharmacopeia.
16. Method of mixing and homogenization. Diffuse and connective mixing. Theory and types of mixing liquids.
17. Theory of mixing semisolids and solids. Determination of mixing degree.
18. Procedure and theory of filter. Major filtering methods.
19. Theory and practice of centrifugation.
20. Procedure of drying. Theory of heat transfer. Drying equipments. Drying with microwave.
21. Theory and practice of fluidization.
22. Methods of crystallization. Crystallization from solution and melt. Curve of solubility. Kinetic of nucleation and nucleus growth. Procedure of crystallization.
23. Characterization of crystalline materials (crystal structure, habit, polymorphism).
24. Amorphization of crystalline materials. Characterization of the amorphous form.
25. Particle size reduction. Theory and practice of milling. Micronization and nanonization in the pharmaceutical technology.
26. Production and grouping of solid dispersions. Excipients for the production of solid dispersions.

27. Characterization of solid materials and particle sets. Habit, micromorphological characteristic. Virtual and real density of particle sets. Fluency.
28. Methods of determination of particle size. Particle size distribution.
29. Molecular encapsulation. Cyclodextrins and co-crystals in the pharmaceutical technology.
30. Procedure of solving. Solubility, dissolution speed.
31. Processing of vegetable drugs to dosage forms. Methods of extraction.

Production and investigation of dosage forms

1. Solutions. Real and colloidal solutions. Solvents. Excipients for production of solutions.
2. Viewpoints of production of drops. Nose and ear drops.
3. Definition and characterisation of syrups. Production and stability of syrups.
4. Production of elixirs and mixtures. Stock solutions.
5. Macromolecules in production of solutions. Mucilages.
6. Preparation, characterization and investigation of tinctures, extracts, cooked and scald preparations.
7. Preparation, characterization and investigation of emulsions and liniments. Excipients for preparation of emulsions.
8. Special emulsion-systems.
9. Preparation, characterization and investigation of suspensions. Excipients for production of suspensions.
10. Grouping of ophthalmic preparations. Viewpoints of production of eye drops and eye cleaning solutions.
11. Solvents for production of eye drops.
12. Semisolid ophthalmic preparations.
13. Ophthalmic disks. Contact lens cleaning and storage solutions.
14. Production of preparations for inhalation. Characterization of the dosage form.
15. Production of dry powder inhalers (DPI).
16. Theory and practice of sterile and aseptic preparation of medicines. Clean area technique.
17. Theory of sterilization. Methods of sterilization.
18. Microbiological preservation. Investigation of efficacy of preservatives.
19. Investigations for microorganisms and pyrogens.
20. Viewpoints of production of parenteral preparations. Excipients for production of parenteral preparations.
21. Definition, physicochemical types, production and investigation of injections.
22. Powder ampoules. Lyophilization in production of powder ampoules.
23. Definition, grouping, production and investigation of infusions.
24. Comparison of injections and infusions.
25. Production, investigation and stability of semisolid preparations.
26. Definition and grouping of ointments. Bases.
27. Semisolid preparations containing active agents. Viewpoints of their formulation.
28. Definition, structure, characterization and major types of creams.
29. Definition, structure and characterization of gels. Gel-forming agents.
30. Definition and characterization of pastes, viewpoints of production.
31. Definition and grouping of rectal dosage forms.
32. Definition of suppositories, bases.
33. Other rectal dosage forms (production and investigation of rectal capsules, solutions, emulsions, suspensions, semisolid rectal preparations, foams, tampons on the basis of Ph. Hg. VIII.)

34. Viewpoints of production of vaginal dosage forms.

Questions of the Prescription practice

(Reading of the prescription, characterization of the components, administration and patient information)

1. Solutio acriflavini
2. Solutio contra rhagades mamillae
3. Gargarisma chlorogenii
4. Solutio pepsin
5. Solutio noraminophenazoni pro parvulo
6. Sirupus zinci
7. Nasogutta zinci cum ephedrine FoNo VI.
8. Klysma chlorali pro infante
9. Solutio lugoli
10. Spiritus salicylatus cum resorcino
11. Mixtura pectoralis
12. Solutio theophyllini
13. Oleum pro inhalatione
14. Infusum ipecacuanhae pro parvulo
15. Emulsio olei jecoris
16. Suspensio anaethetica
17. Suspensio zinci aquosa
18. Emulsio paraffini cum phenolphtaleino
19. Linimentum ammoniatum
20. Emulsio olei ricini

Questions of the Galenic practice

(Technological view-points, production of dosage forms, flowcharts, types and parts of equipments, preparation and dosage form investigations of galenic products)

1. Measurement of mass – Balances. Types of the balances (measurement limit, readability, maintenance).
2. Equipments of particle size reduction. – Crusher: the Hammer grinder. Mill: the Ball mill and the Planetary ball mill (working principle, efficiency, maintenance).
3. Classification of mixing equipments. Types of the mechanical mixers. Parts of mixing equipments.
4. Mixing of solids. Types of the mixers and tumble mixers for powder mixtures.
5. Mixing of semisolids. Types of the mixers and equipments for ointments, creams and high viscosity pastes.
6. Methods of particle size analysis (sieve analysis and microscopic analysis). Size distribution curve and cumulative plot.
7. Preparation process of stock solutions (*solutum*).
8. Preparation process of pharmaceutical syrups.
9. Preparation and characterization of 'Sirupus simplex' (Simple syrup).
10. Preparation and characterization of 'Sirupus sorbiti' (Sorbitol syrup).
11. Preparation process of colloidal solution (mucilage).
12. Preparation and characterization of 'Mucilago methylcellulosi' (Methylcellulose mucilage).

13. Preparation process of pharmaceutical emulsions. Types of emulsions.
14. Preparation process of pharmaceutical suspensions. Flocculated suspensions.
15. Preparation and characterization of '*Unguentum simplex*' (Simple ointment).
16. Preparation and characterization of '*Unguentum emulsificans anionicum*' and '*Unguentum emulsificans nonionicum*' (Anionic and nonionic emulsifying ointment).
17. Preparation and characterization of '*Unguentum hydrophilicum anionicum*' and '*Unguentum hydrophilicum nonionicum*' (Anionic and nonionic hydrophilic ointment).
18. Preparation process of pastes as suspension ointments.