NATIONAL UNIVERSITY OF PHARMACY

TECHNOLOGY OF DRUGS DEPARTMENT

Discipline: «PHARMACY-BASED TECHNOLOGY OF DRUGS»

Dilution of standard pharmacopoeia liquids

Lecture for students of specialty "PHARMACY FOR FOREIGN STUDENTS"

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THE PLAN OF THE LECTURE

1. Standard Pharmacopoeia liquids definition.
2. The ways of prescribing of SPhL.
3. Calculation of SPhL prescribed amount
4. Preparation of liquid medicinal forms by diluting SPhL.

Theoretical issue for self-study:

1. List of SPhL according USP of British Pharmacopoeia.

LITERATURE

1. Chemist's technology of drugs: The manual for students of higher schools / Tikhonov A. I., Yarnykh T. G., Yurieva A. B., Garkavtseva O. A.; Edited by A. I. Tikhonov and T. G. Yarnykh. – Kharkiv: NUPh; Original, 2011. – 424 p.
2. Dry, liquid and soft medicinal forms: A textbook for English students in specialty "Pharmacy" / A. I. Tikhonov, T. G. Yarnykh, A. B. Yurieva, L. N. Podorozhna, S. S. Zuykina; Ed. by A. I. Tikhonov. – Kharkiv: NUPh; Original, 2011. – 208 p.
3. Good Pharmacy Practice (GPP) in community and hospital pharmacy settings / World Health Organization. – 1996.
4. Guidelines on the Equipment Requirements of a Retail Pharmacy Business / To facilitate compliance with Regulations 4(1) and 4(4) of the Regulation of Retail Pharmacy Businesses Regulations 2008 (S.I. No. 488 of 2008).
5. Guidelines to prepare for the final module control and state attestation on the discipline "Chemist's Technology of Drugs": for English students of specialty "Pharmacy": Reference edition. For individual student's work / Yarnykh T. G., Rukhmakova O. A., Buryak M. V. and others. – Kharkiv: NUPh, 2014. – p 48.
6. John F Marriott, Keith A Wilson, Christopher A Langleyv, Dawn Belcher Pharmaceutical Compounding and Dispensing. - Published by the Pharmaceutical Press. – 2010. – 288 p.
7. Tikhonov A.I., Yarnykh T.G., Yuryeva A.B., Garkavtseva O.A. Chemist's Technology of Drugs: The manual for students of higher schools / Edited by A.I. Tikhonov and T.G. Yarnykh. – Kharkiv: NUPh; Original, 2011. – 424 p.
8. United State Pharmacopeia. – XXIV ed. – Rockville: The United State Pharmacopeial, Inc., 2000. – 2569 p.
9. USP Pharmacists' Pharmacopeia. – II ed. – Rockville. The United State Pharmacopeial, Inc., 2008. – 1519 p.

1. STANDARD PHARMACOPOEIA LIQUIDS (SPHL)

STANDARD PHARMACOPOEIA LIQUIDS *are aqueous solutions of medicinal substances (solid, liquid, gas) in strictly fixed concentrations, indicated in the corresponding articles of the SPU manufactured by pharmaceutical enterprises.*

The ways of prescribing of SPhL

Chemical name	Conditional name	Average concentration, %
Solution of aluminum acetate, basic	Liquid of Burov	8
Solution of potassium acetate	Liquid of Potassium acetate	34
Solution of formaldehyde	Formaline	37
Solution of hydrogen peroxide, concentrated	Perhydrole	30
Solution of hydrogen peroxide, diluted	-	3
Solution of ammonia	-	10
Acetic acid	-	3; 30; 98
Hydrochloric acid	-	25
Hydrochloric acid, diluted	-	8.3

2. PREPARATION OF LIQUID MEDICINAL FORMS BY DILUTING SPHL

Calculation of the prescribed liquid amount

If the chemical name of a liquid is specified in the prescription

The calculations proceed from the actual content of a substance in a standard solution according to the formula:

$$X = V \cdot \frac{B}{A},$$

X – is the volume of a standard liquid, ml;
V – is the volume of a solution required to prepare, ml;
B –is the concentration given in the prescription, %;
A –is the actual concentration of a standard liquid, %

Rp.: Solutionis Formaldehydi 5 % 100 ml
D.S. For disinfection of premises

X = (5 x 100) / 37 = 13.3 ml of 37 % sol. of formaldehyde
Purified water: 100 ml – 13.3 ml = 86.7 ml
or **X = (5 x 100) / 30 = 16.7 ml** of 30 % sol. of formaldehyde
Purified water: 100 ml – 16.7 ml = 83.3 ml

2. PREPARATION OF LIQUID MEDICINAL FORMS BY DILUTING SPHL

Calculation of the prescribed liquid amount

If the conditional name of a liquid is specified in the prescription

When calculating the concentration of a standard solution is taken as a unit (100 %)

Rp.: Solutionis Formalini 5 % 100 ml
D.S. For disinfection of wounds.

or

Rp.: Formalini 5 ml
Aquae purificatae ad 100 ml
D.S. For disinfection of wounds.

37 % solution of formaldehyde 5 ml;
Purified water: 100 ml – 5 ml = 95 ml

If the initial solution is weaker than the standard one in a chemist's (30-35 %), it is necessary to recalculate:

$$\text{CC} = \frac{37,5}{30} = 1,25,$$

then the solution of formaldehyde 30 % : 5ml x 1.25 = 6.25 ≈ 6.3 ml;
purified water: 100 ml – 6.3 ml = 93.7 ml

2. PREPARATION OF LIQUID MEDICINAL FORMS BY DILUTING SPHL

Calculation of the prescribed liquid amount

The solution of hydrochloric acid is prescribed under the chemical name, but when calculating its concentration is taken as a unit (100 %)

Rp.: Solutionis Acidi hydrochlorici 2 % 200 ml
D.S. 1 tablespoon 3 times a day before meal

Diluted hydrochloric acid, 8.3 %, 4 ml
Purified water:
200 ml – 4 ml = 196 ml

NB !

Taking into account volatile properties of hydrogen chloride and for increasing the accuracy of small volumes measuring of a strong effective substance, it is recommended to use dilution of this acid (chemist's preparation) - Solutio Acidi hydrochlorici diluti (1:10).

Solution of diluted hydrochloric acid (1:10): 4 ml x 10 = 40 ml
Purified water 200 ml – 40 ml = 160 ml

Conclusions:

1. Standard Pharmacopoeia liquids definition was given.
2. The ways of prescribing of SPhL were considered.
3. Calculation of SPhL prescribed amount were considered.
4. Preparation of liquid medicinal forms by diluting SPhL were considered.

THANK YOU FOR YOUR ATTENTION!