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**МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ**  
**федеральное государственное бюджетное образовательное учреждение высшего образования**  
**«Пермская государственная фармацевтическая академия»**  
**Министерства здравоохранения Российской Федерации**

Кафедра иностраннных языков\_\_\_\_\_

**МЕТОДИЧЕСКИЕ РЕКОМЕНДАЦИИ  
ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ  
ПО ДИСЦИПЛИНЕ АНГЛИЙСКИЙ ЯЗЫК  
для студентов 1 курса, обучающихся  
по направлению 33.02.01 Фармация  
**In the CHEMICAL LABORATORY**  
Составитель Томилова В.М.**

Методические указания утверждены  
на методическом заседании кафедры  
Протокол № 9 от 25 мая 2016г.  
Зав. кафедрой\_\_\_\_\_

ПЕРМЬ 2016

## Тема: In the Chemical Laboratory.

**Цель: формирование коммуникативной компетенции специалиста.**

**Задачи: 1. Формирование и развитие умений коммуникативного взаимодействия.**

**2. Формирование умений и навыков информативного чтения с целью извлечения и презентации информации.**

**3. Формирование профессионального лексикона специалиста.**

### **Pretext exercises:**

#### **TASK 1. Answer the following questions:**

1. Where do the students of Pharmaceutical Academies/ Institutes make experiments?
2. What chairs of your Academy have laboratories?
3. How many rooms does your chemical laboratory in inorganic chemistry consist of?
4. Is the room for making experiments large and light?
5. Your chemical laboratory is well ventilated, isn't it?
6. Do you use pipettes, bottles, graduated cylinders, test-tubes, burners while making your experiments?
7. Do you work with different substances and reagents such as distilled water, inorganic salts, acids, indicators and others?
8. Should you be very careful while working in the chemical laboratory?

**TASK 2. *If you want to describe your chemical laboratory will you need the following words & word combinations? Read them, paying attention to their pronunciation:***

### **Names of processes connected with the work in the chemical laboratory:**

to carry out

to weigh

to store, to keep

to obtain

to equip

to measure

to provide

to dry

to cool

to supply

to clamp

to research

to purify

### **Names of chemical substances and their properties:**

reagent

acid  
alkali  
salt  
solid  
liquid  
solution

**Names of chemical glassware:**

test tube  
funnel  
flask  
volumetric flask  
evaporating dish  
graduated cylinder  
burette  
pipette

**Equipment and apparatus:**

ventilating hood  
drawer  
apparatus  
rack  
device  
desiccator  
burner  
balance  
ringstand  
sink  
centrifuge  
autoclave  
microscope

**TASK 3. Read the text “In the Chemical laboratory” and say if it has:**

1) the same ideas you’ve just discussed in ex.1;  
2) the same plan. Put the points of the plan in the order according to the text:

1. Glassware for measuring
2. Chemical substances and reagents
3. Laboratory apparatus and devices
4. Glassware for general use
5. Functions of a chemical laboratory (Chemical experiments and research)
6. Rooms of a chemical laboratory
7. Glassware for special use
8. Ventilation

## In the Chemical Laboratory

The students of Pharmaceutical Academies/ Institutes of Pharmaceutical departments usually have practical classes in chemistry in chemical laboratories. In these laboratories both different experiments and scientific researches may be carried out.

A typical chemical laboratory is usually large and light and it consists of several rooms: a room for carrying out experiments, a special room for weighing, a room for storing the necessary substances, a room for recording the obtained findings and a room for washing laboratory vessels.

The chemical laboratory is well ventilated because chemists often work with substances that have pungent odour and are even harmful. Ventilating hoods are used for purifying the air. Here is also a sink with running water and a stand with a towel and soap for washing hands.

The laboratory is equipped with long special tables. At the table we can see shelves with drawers for keeping apparatus, and racks with laboratory vessels and glassware of all kinds. Some of them are empty, while others contain laboratory reagents. The most widely used reagents which we can see in every laboratory are acids, alkalis, distilled water, inorganic salts, indicators, etc.

The laboratory vessels and glassware are divided into three groups: glassware for general use includes tubes, test-tubes, funnels, flasks of various shape and size, evaporating dishes, bottles for distilled water or chemical solids and liquids. There is a label on each bottle.

Special glassware includes things necessary for carrying out different analyses. For example, there are special vessels for determination of the molecular weight, and of melting and boiling points, etc.

The glassware for measuring includes graduated cylinders, burettes, graduated flasks, measuring glassware, pipettes and others. Burettes are used for very accurate measurements of volumes, as in volumetric analysis.

The laboratory is provided with different apparatus and devices. One of them, the desiccator, is used for drying materials. The condenser serves for cooling liquids and vapour. Every working place in the laboratory is supplied with bottles, heaters, gas burners.

Students may use microscopes, analytical balances, distillators for obtaining distilled water centrifuge, autoclaves, thermostats and others.

. The simplest and most common of all is liquid thermometer. The apparatus necessary for carrying out experiments are clamped to ringstands.

Here is a special room for weighing. The windows of this room should overlook the North as the sun may interfere with accurate weighing the substances.

When students come to work to the laboratory they should put on white gowns and wash their hands with running water before beginning their work and after it.

**TASK 4. Answer the questions on the text:**

- Do students carry out only experiments in the chemical laboratory?
- Does a typical chemical laboratory consist of two rooms? What are they?
- Why is it necessary to ventilate the chemical laboratory?
- What substances do students work with?
- What groups is all glassware divided into?
- What vessels are included into the group of glassware for general use?
- What vessels does the glassware for measuring include?
- What apparatus and devices is the chemical laboratory provided with?
- Does the work in the chemical laboratory require cleanness?
- What do students put on when they come (to work) to the chemical laboratory?

**TASK 5.a) Look at the figure 1 and say what glassware you can see there.**

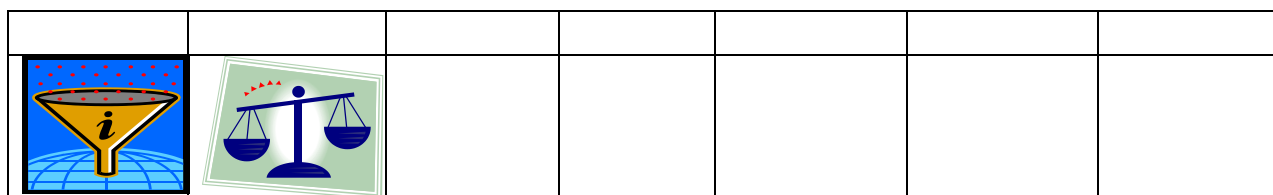


Fig.1

**TASK 6. Find the necessary words in the text, fill in the blanks with them, read these sentences and translate them into Russian:**

- The students have practical classes in chemistry in---
- A chemical laboratory consists of such rooms as for carrying out experiments, for weighing, for---substances, for recording findings and a room for--vessels.
- Chemists often work with substances that have---odour and are even---
- At the table we can see shelves with--- for keeping---and---for vessels and glassware of all---
- The laboratory vessels and glassware are divided into---groups. Such as for general---, special---and for---
- Pipettes-----a means for greatest accuracy in measuring a volume.
- Desiccator--- ---for drying materials.
- Condenser serves for---liquids and vapour.
- 

**TASK 7. What for are the following devices, apparatus and glassware used for? Make up sentences.**

1. Desiccators		taking temperature
2. A filter funnel		cooling liquids
3. Condensers		measuring liquids

4. A pipette 5. A burner 6. A distillator 7. Measuring glasses 8. Graduated cylinders 9. A hood 10. Balances 11. Bottles, vessels 12. A stopper 13. A thermometer 14. Stands	<b>is / are used for</b>  <b>is / are employed for</b>  <b>serves / serve for</b>	weighing substances keeping liquids fixing vessels, devices filtering liquids dropping liquids drying materials closing bottles purifying the air distilling water or other liquids heating solution
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**TASK 7. What for are the following devices, apparatus and glassware used for? Make up sentences.**

15. Desiccators 16. A filter funnel 17. Condensers 18. A pipette 19. A burner 20. A distillator 21. Measuring glasses 22. Graduated cylinders 23. A hood 24. Balances 25. Bottles, vessels 26. A stopper 27. A thermometer 28. Stands	<b>is / are used for</b>  <b>is / are employed for</b>  <b>serves / serve for</b>	taking temperature cooling liquids measuring liquids weighing substances keeping liquids fixing vessels, devices filtering liquids dropping liquids drying materials closing bottles purifying the air distilling water or other liquids heating solution
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**TASK 8. Name the following substances and say what group they belong to:**



SALT

ACID

ALKALI

OX-  
IDE/DIOXIDE

**TASK 9. Agree or disagree with the following statements:**

- Every day the students of the Pharmaceutical faculty have one or two hours of lectures and practical classes.
- Chemistry is the most important subject for all the pharmaceutical students.
- At the chemistry classes the students do not study constituents of substances.
- The members of the SSS study only the problem of stabilizing injection solutions.
- All the experiments are carried out in the laboratory room for washing vessels.
- A chemical laboratory should not be ventilated to keep pleasant odour.
- The laboratory is equipped with small tables, shelves with drawers for keeping books.
- Burettes contain such reagents as acids, alkalis, distilled water, inorganic salts, indicators, etc.
- Glassware for general use includes cylinders, graduated flasks, pipettes and others.
- Special glassware includes evaporating dishes, bottles, special vessels for determination of the molecular weight.
- The glassware for measuring includes vessels for determination of melting and boiling points.
- Burettes are used for very accurate measurements of volumes.
- Volumetric flasks are used to measure specific volumes for preparing solutions in quantitative analysis.
- A chemical laboratory is provided with different apparatus and devices.
- A desiccator is a device used for measuring materials.
- A condenser as a vessel for substances serves for evaporating liquids.
- Every working place in the laboratory is supplied with distillators and condensers.
- The windows of the laboratory room for weighing should overlook the South.

**TASK 10. Ask your desk-mate:**

- how many hours a day they work in the chemical laboratory?
- if they have lectures or practical classes everyday.
- where they perform their experimental and practical work in chemistry?
- what kind of work the students perform in chemical laboratory?
- what instructions they follow while working in the chemical laboratory?
- how many rooms a chemical laboratory may consist of?
- why the tables in the chemical laboratory are long?
- what every laboratory table is provided with?
- where the laboratory reagents are contained?
- what reagents are most widely used?

- what groups the laboratory glassware is divided into?
- what glassware for measuring they use in the chemical laboratory?
- what glassware for general use there is in your chemical laboratory?
- if there is glassware for special use.
- what apparatus and devices your chemical laboratory is supplied with?
- what they are for?

TEXT № 2. *Read the text and do the exercise after it:*

**Before making our experimental work** we must remember and observe the following:

Every vessel used for the experiment must be perfectly clean. When the experiment is completed, all vessels and apparatus used should be washed clean, drained, wiped dry, and put back to their places to leave the working place ready for the next experiment.

We should be very careful in handling glassware, in mixing different liquids and using just the exact amount of reagents needed.

The flame should always burn in the proper way. Bottles containing inflammable or explosive substances should always be tightly stoppered and placed as far as possible from any flame.

We should enter all work in the note-book at the time of observation, leaving nothing to be written up afterwards from memory. We must put down the names of chemicals used, the amounts of substances involved in the reaction, the boiling and melting points, specific gravity, the changes in colour, etc. Before throwing away any liquor or residues, one should consider carefully if he can make any further use of them. One should also develop the habit of cleaning all glass things immediately after use. Cleaning becomes more difficult if the dirty apparatus is allowed to stand for any considerable period, especially if volatile solvent are evaporated in the meantime.

TASK 11. *Answer the questions:*

1. What rules should you follow while making chemical experiments?
2. Do you break any rules?
3. Using information from texts No.1 and 2 and your own knowledge of rules, fill in the table according to the model:

<b>You should...</b>	<b>You shouldn't...</b>
be very careful using reagents	work without white gowns
.....	.....
.....	.....
.....	.....



--	--

**TASK 12. *Read the description of the experiment and do the task after it.***

**Theme: Halogens**

**Description of the experiment.**

**Experiment 1. Obtaining chlorine and chlorine water.**

Put 3-4 g of potassium permanganate into a flask and add concentrated sulphuric acid by drops.

Observe the evolution of chlorine in gaseous state, pay attention to its colouration. Put gas-removing tube into a vessel with water, observe the dissolution of chlorine in water.

Make up the equation of the reaction of obtaining chlorine and its dissolving in water and in alkali.

**Experiment 2. Solubility of bromine and iodine in organic solvents.**

Dilute with water with water 2-3 drops of bromine water to a pale-yellow colouration, add 5-6 drops of organic solvent (benzene, chloroform), shake intensively, give it to stand. Observe the colouration of organic solvent layer.

	colouration of organic solvent layer	supposed presence of ion in a sample
sample solvent + chlorine water + organic solvent	→colourless →yellow →pink	→chloride →bromide →iodide

**TASK 13. *Describe the above experiment as if it had already been done. Change the Imperative Mood into the Past Simple.***

**SITUATIONAL TASKS:**

1. Draw the layout of your chemical laboratory in inorganic chemistry and make up a story about it.
2. Compare your chemical laboratory in general chemistry with a typical one.
3. Make up the instruction for the students working in the chemical laboratory.
4. Describe one of your chemical experiments (laboratory works).