***SAFETY IN LABORATORY ROOMS.***

REQUIREMENTS:

Work performed in laboratories and experimental facilities is performed with the use of fire, explosive or toxic chemicals. Therefore, the shop, the central laboratory of the enterprise, the central research laboratory is important. Because intermediate or final control is carried out by technical means, based on the methods applied in the workshop laboratory, a conclusion is given to the product or substance properties. In the central and central scientific-research and educational laboratory of the university, testing methods are improved, that is, on the basis of equipment and methods, new products, properties of substances and new technological processes are studied, and its use is recommended. This may result in injury, high risk or poisoning due to the use of untested substances. Therefore, it is necessary to pay special attention to safety, sanitary requirements and standards every day.

**I. General safety requirements.**

1.1. Laboratory classes are allowed only to professors-teachers (employees) assigned to this task on the basis of an order, who have passed the medical examination and safety technique instruction test.

1.2. Employees and students who violate the requirements of the technical method of safety, causing an accident or accident are subject to disciplinary or administrative responsibility.

1.3. It is necessary to carry out laboratory classes only when wearing special clothes.

1.4. Let strangers enter the laboratory rooms only with the permission of the head of the department or the dean of the faculty and with the presence of an observer;

1.5. Laboratory equipment and other devices must be in good condition;

1.6. He should not drink alcohol or consume intoxicating substances during work.

1.7. Professors and students should keep public property as the apple of their eye.

1.8. Understanding of rights and obligations.

1.9. Active, high morale, good relationship with other persons who communicate with the administration, university employees, students in the course of work.

1.10. Professors-teachers (employees) conduct laboratory classes based on the following normative documents:

1.10.1. University charter;

1.10.2. Internal labor procedure rules and accepted regulatory documents;

1.10.3. According to the articles of the Constitution of the Republic of Uzbekistan, he is obliged to observe labor discipline. It is based on the conscientious and honest performance of labor obligations by workers and employees, and is a necessary condition for high labor productivity.

1.10.4. Compliance with the collective agreement;

1.10.5. Adhere to the specified period of class time.

1.10.6. They must follow the rules of safety equipment production cleanliness, labor efficiency, technical and fire, electrical safety, and sanitary and hygiene requirements.

1.10.7. According to this guideline.

1.11. Every person must conscientiously and honestly comply with the assignments and tasks given to him/her and observe the labor discipline, fulfill the orders, orders and contracts of the employer in accordance with the law in a timely manner.

1.12. Every person (teacher, worker, student) should be able to carefully save them, provide first aid to the injured when an accident happens.

1.13. Must know how to act in case of emergencies, how to use and use primary fire extinguishers.

1.14. His clothes should be clean; his health should be fit for work.

1.15. Non-fulfilment of orders and orders contrary to security techniques;

1.16. It is not recommended to work in the laboratory without anyone, because in the event of an accident there will be no one to help the victim and eliminate its consequences.

1.17. Maintain peace and order while working in the laboratory, because serious accidents can occur due to disorder and haste during work.

1.18. The following means of extinguishing a fire in the laboratory should be available: a box with sifted sand (with a shovel), an asbestos or thick woolen blanket, fire extinguishers, a first aid kit with everything you need to provide first aid, a gas mask or respirators, and the teacher conducting the laboratory should know where they are located.

1.19. When conducting certain experiments, it is necessary to wear a protective mask or goggles.

**1.20. Requirements for the structure of a chemical laboratory.**

1.20.1. The building of a chemical laboratory belongs to category B in terms of fire hazard according to SNIP-N-90-81, ONTP 24-86. Some working premises belong to category A and are located separately from other laboratory buildings or in a separate part - i.i or on the top floor of the building.

1.20.2. The laboratory building is built of non-combustible materials with a fire resistance level of at least II, and the floor is covered with liquid-proof, non-combustible or difficult-to-burn metal tiles, xylolite, linoleum. Warehouses for storing flammable liquids and harmful substances intended for the laboratory are built separately. Daily cost warehouses where acid and reagents are stored are placed nearby, at a distance.

1.20.3. Cylinders filled with compressed and liquefied gases are stored outside the laboratory, protected from sunlight, and heated in winter.

1.20.4. Laboratories using radioactive substances, X-ray and high-voltage laboratories are equipped in accordance with special regulations (norms), a laboratory room for working with mercury, bromine, arsenic, and extremely harmful substances is located and equipped separately.

1.20.5. Gas and water supply networks to the laboratory are made of steel pipes and are equipped with common gas and water taps. Fences (with protective and barrier devices) are installed outside the laboratory - in the corridors, grilles and handles are installed at the sources of water, liquid pouring, sewage.

1.20.6. A ceramic container is placed for collecting and sending waste materials. It is prohibited to pour waste materials of flammable and corrosive substances into the sewer.

1.20.7. All work with volatile, harmful substances is carried out in air-exhausted cabinets (cabinets) using personal protective equipment, the air extraction speed should be 0.3-0.8 m/s, the total air exchange rate should be 4-6, and when working with highly harmful substances - 8-10 times. Depending on the nature of the work, the laboratory is equipped with fire extinguishing agents, fire extinguishing equipment is placed in special places. Also, a fire hydrant and hose are installed in the corridor of the laboratory building. The human body can get burned from the effects of acids and alkalis. At this time, a water tap installed at the workplace should be used to quickly wash the burned area. It is also desirable to have a first aid kit in the laboratory.

**II. Safety requirements before starting work.**

2.1. Before conducting laboratory exercises, each student must be familiarized with the requirements of the labor protection instructions and must sign and record their familiarization in the journal. Before starting work, the current state of all equipment in the laboratory, the operating procedure, must be recorded in the workbook (journal). Check the condition of all laboratory equipment and the like for readiness.

2.2. The teacher or laboratory assistant must check the serviceability of the fume cupboard before performing experiments. After checking all rooms and sealed areas, make sure that the seals are not broken, that the material assets are not broken, and that all equipment in the room (laboratory) is in full place and in working condition, start work.

2.3. The first aid kit in the room should contain: bandage, cotton, tourniquet; 5% iodine, 10% sodium bicarbonate, 1% potassium permanganate, boric acid (3% 10 ml.), 5% ammonia solution (in ampoules), valerian tablets, antiseptic drugs (hydrogen peroxide), furatsilin tablets, painkillers, scissors and tweezers). The room should be equipped with electricity, water and sewage and meet the requirements of state standards.

2.4. Before starting the experiment, it is necessary to know the properties of all substances used and synthesized. Therefore, the work plan, the technique of its implementation and the scheme of the equipment should be discussed with the teacher.

2.5. It is necessary to arrange special clothing, special footwear and personal protective equipment, check their suitability.

2.6. It is necessary to receive an assignment (order) or verbal order for the upcoming work and give instructions on its safe execution. It is necessary to record the verbal order for the upcoming work in the operational journal. It indicates who gave the order, the place of work, name. The deadline for its execution.

2.7. Also review the entries in the journal for any malfunctions and violations of safety equipment during the previous day. Make sure that fire extinguishers and first aid supplies are ready.

2.8. Make sure that the circuit breakers, alarms and automatic control system are set. installation of barriers and safety signs in open areas;

2.9. Check the integrity of lighting (devices, electrical wiring, electric lamps and lamps). The lighting of the place should be adjusted in such a way that the work area is sufficiently illuminated and does not blind the eyes. If the work in the laboratory is organized correctly, and safety rules are fully observed, there is no possibility of poisoning, burns, injuries, fire and explosion.

2.10. The laboratory manager, the head of the scientific work, when drawing up instructions, must indicate the following:

2.10.1. for example, the type of work, the type of synthesis or analysis, the method of performing the task or scientific work, the maximum permissible concentration of the substances being processed, the concentration of solutions, the degree of purity of the reagents and the permissible amount of residues, temperature, pressure and other conditions, methods for performing the work safely.

2.10.2. Great attention should be paid to the quantitative and qualitative characteristics of the substances used. The personnel performing the work must be familiar with the chemical containers, instruments, acids, alkalis, flammable liquids, gases, glassware - must be trained to interact correctly with the means. Therefore, they are trained to perform the work safely, their level of knowledge is periodically checked, and they are certified. When performing extremely dangerous work, in case of an emergency, at least two people are required to be present in one place. A responsible representative for safety equipment (responsible person) is appointed for each department and dangerous place.

2.10.3. It is recommended that all hazardous and non-hazardous substances be stored in sealed containers with a clear label indicating their name, purity, and concentration.

2.10.4. Each stored product or substance must have a special place (cabinet, folder, rack) and a list must be provided. Leaving a chemical product, substance, processed sample, washing water, or residues of unfinished work in an unknown or unmarked place, even temporarily, can lead to unpleasant incidents due to carelessness or negligence.

2.10.5. Flammable substances are stored in the laboratory in thick-walled glass containers in quantities sufficient for one to three days. The containers are placed in closed boxes made of non-combustible material.

2.10.6. Fuming nitric acid, bromine, and, if applicable, odorous substances are stored in cabinets (cabinets) with constant gas and electricity supply.

2.10.7. Potent poisons are stored in separate, sealed, sealed boxes. They are issued under the supervision of a designated person.

2.10.8. Reporting on the issuance of poisonous substances is carried out and finalized in accordance with special rules for handling them.

2.11. During their work, laboratory assistants must:

2.11.1. Be familiar with the procedure for laboratory assistants;

2.11.2. Be instructed on objects that deserve special attention;

2.11.3. Be familiarized with the administration and materially responsible persons;

2.11.4. Be familiar with the rules for receiving and handing over material objects and protected objects.

2.12. Laboratory assistants are prohibited from:

2.12.1. Entering dangerous rooms;

2.12.2. Removing or moving barriers and warning signs;

2.12.3. Arbitrarily repairing or operating electrical and gas equipment;

2.12.4. To visit workplaces for purposes other than work and to distract and disturb workers and students;

2.12.5. To fall asleep or be intoxicated during work;

2.12.6. To use prohibited electrical equipment;

2.13. The laboratory must be adequately equipped with lighting and switches.

2.14. Liquids with volatile and flammable properties stored in the laboratory must be in special places and containers.

2.15. Acid containers must have additional protective covers.

2.16. It is necessary to work with special lifting devices, protective equipment, i.e. gloves, shoes, and gowns.

2.17. These clothes must be acid-resistant and have passed state inspection.

2.18. Volatile: gaseous liquids and substances must be stored in cabinets with vacuum cleaners.

2.19. Measurements and necessary tools must have passed state standard inspection.

2.20. All rooms of the laboratory must be provided with fresh air.

2.21. A ventilation device (fan) must be installed in rooms with poor air quality.

2.22. When turning on the ventilation device (fan), the following actions must be performed:

2.22.1. Check the integrity of electrical installations and other places (while ensuring safety);

2.22.2. The air exchange device is turned on 30 minutes before the start of work and turned off after the end of the working time.

2.23. Before starting work in the laboratory, each employee and student must go through the instructions, be registered in the logbook and sign.

2.24. It is strictly forbidden to assign those who have not received the instructions to laboratory work.

2.25. Safety requirements before starting laboratory classes.

2.25.1. Conduct a complete inspection of the laboratory room.

2.25.2. Laboratory assistants, students and the teacher conducting the lesson must also wear a white coat.

2.25.3. Check that the hood (cabinet) is in working condition for air exchange.

All work with alkalis and acids must be carried out wearing protective glasses.

2.25.4. When pouring acids and alkalis from large containers into small ones through a siphon or funnel, rubber gloves, an apron, and safety glasses should be worn.

2.25.5. It is forbidden to suck acids and alkalis by mouth with a pipette or siphon.

2.25.6. Sulfuric acid can only be diluted in heat-resistant containers, since a lot of heat is released. In this case, the acid is poured into water, but not vice versa. When performing this work, it is necessary to wear safety glasses.

2.25.7. It is also necessary to wear goggles when dissolving caustic alkalis. In this case, smaller pieces of alkali are gradually dissolved in water. Pieces of alkali can be removed with pliers.

2.25.8. Sulfuric acid cannot be used as a water-absorbing agent in vacuum desiccators, because if the desiccator breaks, the acid will slash and burn.

2.25.9. Extreme caution must be taken when working with hydrofluoric acid. Rubber gloves, safety glasses or a mask should be worn and the work should be carried out in a fume hood.

**III. Safety requirements during work.**

3.1. During work, a special worker must always have a certificate confirming his identity on his head and next to him;

3.2. Laboratory rooms must be equipped with technical and fire safety posters and fire extinguishing equipment (fire extinguisher, sand, etc.) and the rules must be followed.

3.3. Students must perform laboratory work only with the permission of the teacher and under the supervision of the head for the dangerous and necessary part of the work.

3.4. The following should be monitored periodically:

3.4.1. Room temperature;

3.4.2. Students should not joke with each other during laboratory lessons and should not touch chemical liquids without permission;

3.4.3. It is forbidden to replace another person during the lesson without the teacher's permission.

3.5. The head of the laboratory (office), senior laboratory assistant and laboratory assistant, senior preparatory and preparatory are responsible for:

3.5.1. The head of the laboratory or office carries out his activities according to the work plan approved by the department;

3.5.2. Ensures the safety of material assets under his care and inspects them before and after the start of laboratory lessons;

3.5.3. Organizes the work of laboratory assistants and preparatory;

3.5.4. Prepares laboratories and offices for practical lessons;

3.5.5. Provides necessary literature, firearms, product (goods) samples, chemical containers and reagents for passing practical classes;

3.5.6. Receives laboratory equipment and rooms from laboratory assistants after class;

3.5.7. Ensures normal operation of the equipment installed in the office and laboratory and safety for human health;

3.5.8. Monitors and controls students' compliance with internal procedures, technical and fire safety rules, and sanitary and hygienic requirements;

3.5.9. Prepares classrooms and laboratory rooms for classes;

3.5.10. Takes reagents, containers and other materials necessary for laboratory-practical training from the warehouse;

3.5.11. Vest, hair, soap. provides napkins, etc. for laboratory exercises.

3.6. The following are prohibited.

3.6.1. Bringing and storing excess equipment into the laboratory;

3.6.2. Leaving the laboratory room unattended during the lesson;

3.6.3. Doing things other than those specified in the instructions and plan for laboratory lessons;

3.6.4. Smoking and eating in the laboratory are strictly prohibited.

3.6.5. It is not allowed to taste chemicals.

3.6.6. It is forbidden to suck up any solution with a pipette.

3.6.7. It is forbidden to leave working equipment unattended.

**IV. Safety requirements in case of accidents and emergencies.**

4.1. In the event of a malfunction in the equipment, instruments, devices, devices and protective equipment in the laboratory or any fire safety hazard, in the event of an emergency, the teacher's obligations are:

4.1.1. To immediately stop the laboratory work and notify the university administration;

4.1.2. To warn students about the danger;

4.1.3. To eliminate the most necessary malfunctions while complying with the safety requirements of the labor protection instructions and rules;

4.1.4. To provide first aid to students in case of an accident, to maintain the state of the incident if it does not pose a threat to their life and health or lead to an accident.

4.2. Fire safety requirements:

4.2.1. Responsibilities of teachers and students in the event of a fire:

4.2.2. To turn off the power supply and extinguish the fire;

4.2.3. All combustible waste must be periodically removed to specially designated places and disposed of after collection;

4.2.4. Smoking must be carried out only in special places with special signs and a container filled with water;

4.2.5. Must know how to use fire extinguishers;

4.2.6. Must be able to identify the main causes, prevention and ways of fire, and in the event of a fire, be able to extinguish it;

4.2.7. When electrical wires catch fire, the first thing to do is to de-energize the line, for this it is necessary to press the switch (switch) and immediately call the fire brigade;

4.2.8. It is not recommended to extinguish a live electrical wire with water or foam, since water conducts electricity well and can cause electrical injuries;

4.2.9. All places must be equipped and provided with water and other primary fire extinguishing agents, display posters, notification devices and warning signs;

4.2.10. Rescue plans must be posted on each floor of the buildings and people's safety must be ensured in the event of a fire;

4.2.11. Combustible waste should be stored 50 meters away from buildings.

4.2.12. It is prohibited to block the place where fire-fighting equipment is stored and use it for other purposes;

4.2.13. Used and unused materials intended for wiping dust and oil should be stored in metal boxes with closed lids;

4.2.14. Materials for wiping rust, dust and oil from used equipment, shavings and waste should be removed daily after training.

4.2.15. Highly flammable and fire-hazardous materials (gasoline, kerosene, alcohol, varnish, paint, oil, etc.) should be stored in a special room agreed with the fire inspection. The smell of these materials in workplaces should not exceed the norm established for the working day. It is forbidden to leave them in the warehouse after the working day. It is forbidden to store and use gas-pressure containers.

4.2.16. In the room where flammable, fire-hazardous equipment and inventory and materials are stored, electric lamps must be covered with glass covers.

Note: In the event of a fire, it is necessary to immediately turn off gas and electrical appliances in the laboratory. All flammable substances are removed from the fire. The fire is extinguished with a fire extinguisher, sand or a fire blanket. Water should not be sprayed on the fire, otherwise the fire often spreads widely and the fire intensifies. If a person's clothes catch fire, they should be immediately covered with a blanket or coat. A person whose clothes are on fire should not run, because running will cause the fire to flare up. Burning clothing can be extinguished by spraying water or rolling the person whose clothing is burning to the ground. Burning kerosene, gasoline or alcohol cannot be extinguished with water.

4.3. General rules and requirements of electrical safety:

4.3.1. An electric current of 0.1 ampere is considered fatal to human life;

4.3.2. In order to prevent electrical injuries, all electrical devices and appliances must be grounded (earthed);

4.3.3. Electric heaters must be installed in a specially designated place;

4.3.4. Malfunction of electrical equipment or failure to comply with the rules and requirements for its use can lead to injury to a person.

4.3.5. Electric current can affect the human body thermally, electrolytically and biologically. As a result, there may be changes in a person's breathing, heart function, metabolism, blood composition and other organs.

4.4. First aid provided until the arrival of a doctor in the event of an accident:

4.4.1. Must be trained in providing first aid until the arrival of a doctor in the event of an accident, must know the methods of transporting the victim, the location of the first-aid kit and what is in it, and be able to use the items in the first-aid kit;

4.4.2. A first-aid kit with first-aid supplies must be located in a designated room on each floor until the arrival of a doctor. Each employee who provides first aid until the arrival of a doctor must have free access to the first-aid kit;

4.4.3. In addition to the general set of medicines, first-aid kits should contain solutions of baking soda, bromine and citric acids, camphor, heated magnesia, Gabber’s salt;

4.4.4. The first-aid kit should be used only for providing first aid to the injured;

4.4.5. The responsibility for completing the first-aid kit lies with the medical officer of the treatment point or a person specially appointed by order of the department;

4.4.6. The administration and the trade union committee of employees and students monitor the availability and storage of everything in the first-aid kit.

4.5. An employee who witnessed an accident or identified the injured person:

4.5.1. Take measures to relieve the injured person from the effects of the injurious factor;

4.5.2. Deliver the victim to a medical facility, or if it is not possible to deliver, call a medical facility employee to the scene of the incident;

4.5.3. Immediately call an ambulance if there is no medical facility;

4.5.4. Notify the building manager or university head of the accident site about the victim.

4.6. First aid: should be provided depending on the type of injury (poisoning).

4.6.1. In case of a heat burn, immediately soak a cloth or cotton wool in a solution of potassium permanganate, ethyl alcohol or an alcohol solution of tannin and apply it to the burn site;

4.6.2. If acid is spilled, the burn site should be immediately washed under running water, then wiped with a 3% solution of sodium bicarbonate.

4.6.3. The burned area of ​​caustic alkalis is washed under running water, then wiped with diluted acetic acid and again under running water.

4.6.4. If acid or alkali gets into the eye, it is necessary to rinse the eye with plenty of water for 3-5 minutes (although this is difficult). Then, if an acidic reagent has been splashed, it is washed with a solution of bicarbonate, if an alkali has been splashed, it is washed with a solution of boric acid. After that, of course, it is necessary to consult a doctor.

4.6.5. In case of burns caused by phenol, the affected area should be wiped with alcohol.

4.6.6. In case of burns caused by bromine, the area should be immediately washed with alcohol or a diluted solution of alkali, then wiped with alcohol again. After that, a special ointment is applied to the burn area. In case of poisoning with the smell of bromine, it is necessary to breathe deeply from alcohol vapors, drink milk and go out into the open air.

4.6.7. If a water-insoluble organic substance is spilled on the skin and burns, the burn site is washed with a solvent in which this substance dissolves.

After providing first aid to the victim, he is taken to a medical facility.

4.7. In case of emergencies and emergencies or in case of unpleasant incidents between people, the following organizations should be called:

4.7.5. 101-fire safety service;

4.7.6. 102-police;

4.7.7. 103-ambulance;

4.7.8. 104-gas;

4.7.9. 1050-rescue service.

**IV. Safety**

**Requirements after completion of laboratory work.**

5.1. The worker is obliged to:

5.2. Remove all chemicals and place them in metal cabinets, ensuring safety.

5.3. Put the room in order.

5.4. The air in the training and laboratory room should be changed 2-3 times during practical training. After working with toxic, volatile substances, the mouths of the containers should be tightly closed with stoppers and paraffined as soon as possible.

5.5. After the training, the laboratory assistant puts the classroom and laboratory equipment in order, washes glassware in accordance with the established requirements and places it in a drying device. After drying the glassware, put it in order in the cabinets.

5.6. After laboratory work, wears special gloves, washes dishes and sinks, and cleans the workplace.

5.7. Putting the workplace in order (cleaning equipment and tools from dust, removing waste to separate places, placing tools in their places);

5.8. Placing special clothing and other protective equipment in a special cabinet;

5.9. Turning off gas, water and electrical appliances, laboratory room lights after work;

5.10. After completing laboratory work, wash your face and hands with warm water and soap, and take a shower if necessary.

5.11. Reporting all deficiencies identified during work to the head of the department and eliminating them;

5.12. A record is made in the journal about events that occurred during the work process (this journal must contain the date, month, year, name, surname and signature).

**VI. RESPONSIBILITY.**

6.1. The head of the office, senior laboratory assistant and laboratory assistants are responsible for maintaining laboratory equipment in good condition and fulfilling the requirements of this instruction.

6.2. It is prohibited for managers at all levels to give instructions on the implementation of work that contradicts the current rules and norms (standards) on labor protection.

6.3. Persons guilty of violating laws and other regulatory legal acts on labor protection or obstructing the activities of representatives of state and public control bodies shall be subject to disciplinary, administrative or criminal liability in accordance with the procedure established by the laws of the Republic of Uzbekistan. Other employees of enterprises shall be held liable in accordance with the established procedure for violating the requirements of regulatory legal acts on labor protection (Article 36 of the Law on Labor Protection).

6.4. The responsible person shall familiarize each employee with the above instruction before starting work and have them sign the workplace registration log.

**6.5. Responsibilities:**

Heads of departments and offices, senior laboratory assistants, laboratory assistants and teachers teaching the course.

**Note:** It should not be forgotten that compliance with safety rules before, during and after work is a necessary condition for preventing injuries associated with production, training and practice!!!

Safety requirements for working with highly hazardous substances (sodium and potassium metals, explosives, explosive mixtures) during the course of the lesson, under low pressure and under high pressure.

It is necessary to wear protective glasses or a mask. They should be removed only after the end of the lesson. Most of the reagents used in the laboratory are intermediate products formed as a result of the reaction, as well as products of the reaction in the vapor, gas, solid and liquid state, are flammable and combustible substances. Some substances are explosive, while others form explosive mixtures when mixed with air. Mineral (chlorine, nitrate, sulfate, fluoride) acids, as well as strong organic acids (poly- and monohalide carboxylic acids), cause chemical burns if they come into contact with the skin and mucous membranes. If acid splashes into the eyes, the pupil of the eye can be damaged and a person can go blind. Caustic alkalis and their solutions, as well as metal alcoholates, also cause chemical burns if they come into contact with the skin and mucous membranes. Therefore, it is necessary to remember the rules for working with acids and alkalis. To determine the smell of a substance, smell it without bending over the container and without taking a deep breath. To do this, carefully blow the vapor or gas of the substance from the mouth of the container to the nose with your hand and smell it a little.

Working with glass and glassware: Carelessness and improper handling when making chemical laboratory containers, instruments, and small-sized devices from glass can lead to damage. Therefore, the requirements of the established instructions are followed during the processing of glass, the manufacture of products or custom-made devices. To prevent glassware from breaking, it is tempered in a fire and its operability is checked using a Polaris cope. If thin-walled glass containers - pycnometers, beakers, flasks - are used under a certain level of pressure, it is useful to place them in a checked and sealed desiccator. Glass containers, instruments, and devices used under vacuum or pressure are first checked and tested. In order to prevent glass breakage and injury from its fragments, the object or device should be wrapped in a metal mesh, polyvinyl chloride tape, or at least a towel. In order to ensure safety in work where the containers of glass devices may break, protective screens - metal meshes, layers are installed. The mouth of heated glass containers cannot be closed with a dense barrier without cooling. In some cases, it is necessary to heat the container in hot water to open the lid, remove the glass or rubber stopper. It is not recommended to store concentrated acids and alkalis in thin-walled chemical containers. Substances that can explode cannot be sealed in ampoules. Substances are cooled below the boiling point in glass ampoules (usually 50% of the volume), sealed, stored and processed in metal cartridges. To open the ampoule, the substance contained therein is cooled to a temperature below the boiling point.

**The manual was developed based on the requirements of the Regulation No. 870 “On the Development of Occupational Safety Instructions”, registered with the Ministry of Justice of the Republic of Uzbekistan on 07.01.2000.**

When performing laboratory work, injuries, high levels of danger or poisoning may occur due to the use of untested substances. Therefore, special attention is required to pay attention to safety and sanitary requirements and rules every day. (Manual for Higher and Secondary Specialized Education of the Republic of Uzbekistan - 2003 - Tashkent - p. 90).

**Basis:** Prepared on the basis of the Labor Protection Book recommended by the Ministry of Higher and Secondary Specialized Education of the Republic of Uzbekistan as a textbook for students of higher educational institutions. Tashkent - "Uzbekistan" - 2003.