

WORKING RULES AND TECHNICAL SAFETY RULES IN THE ORGANIC SYNTHESIS LABORATORY

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Abstract: This article discusses the importance of paying attention to the cleanliness of laboratory equipment, fastening devices when assembling experimental equipment, and the effectiveness of the experiment. It is necessary to use a chromium compound when washing chemical dishes. Metal equipment: reactors, cubes should be washed in kerosene, gasoline, dried in fresh air, after which laboratory work can be carried out, and before conducting the experiment, it is necessary to fully familiarize yourself with the method of performing the work.

Keywords: Equipment, reactor, solvents, electric handles, drive.

When working with organic substances, solvents, flammable and combustible compounds, the following rules must be strictly observed:

- a) It is absolutely impossible to store organic substances and compounds with similar properties near fire;
- b) When assembling the device for conducting laboratory experiments, it is necessary to ensure the tightness of the equipment to prevent the release of organic substances in the form of gas and vapor;
- c) It is necessary to heat flammable substances (gasoline, solvents, etc.) on a closed heater (stove) or in a water bath;
- g) Fire prevention measures must be taken. If organic substances burn, do not extinguish them with water. Burning organic substances should be extinguished with acid fire extinguishers or with sand, felt.

Rules for working with electrical tools and equipment

- 1) When conducting laboratory exercises with flammable substances and solvents, it is prohibited to use electrical appliances with open wires during work.
- 2) In case of fire from electrical appliances, they must be extinguished using asbestos cloth or fire extinguishers.
- 3) After using electrical appliances, they must be immediately disconnected from the power supply.

Rules for working with gaseous substances

- 1) Gas-filled cylinders and containers must be protected from external heat.
- 2) When working with flammable gases, they must be tightly closed (hermetically) and protected from fire.
- 3) Standard gas cylinders used must be stored in specially designated places.

Rules for working with toxic substances

- 1) Laboratory work with solvents and volatile toxic substances must be carried out in air-tight (ventilated) cabinets.
- 2) When working with solvents and toxic substances, it is necessary to be careful of the risk of burns. They must not be allowed to spill or splash.
- 3) Toxic substances should only be removed from containers with a pipette. Sucking them by mouth is prohibited.

Rules for working with acids and alkalis

- 1) When mixing acid with water, it is always necessary to add acid to water.
- 2) When dissolving alkali in water, it is necessary to constantly stir.
- 3) The area burned by acid should be washed with water or soda water.

Methods for cleaning organic substances

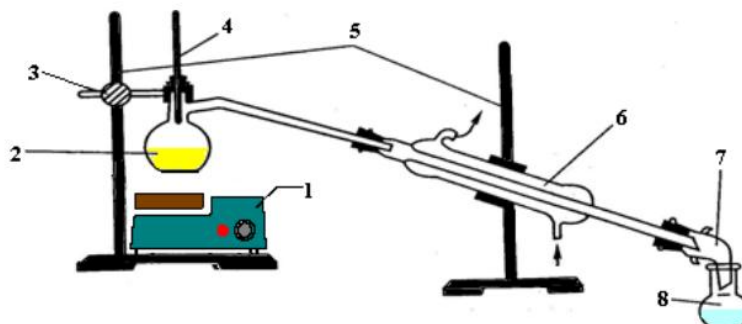
When the distillation method for separating and purifying liquids is carried out at atmospheric pressure, such distillation is called a simple distillation method. Molecular distillation refers to distillation at low pressure, at a temperature below the boiling point of the liquid, and is divided into two types: 1) distillation in a vacuum, 2) distillation with water vapor.

Distillation is the process of separating multicomponent liquid mixtures into separate fractions that differ in composition. The essence of this method is that the liquid is heated to its boiling point and its vapors condense in a refrigerator, forming a distillate.

When a liquid is heated, the liquid boils when the pressure of the vapor formed above it equals the atmospheric pressure. Therefore, there is a relationship - proportionality - between the boiling point of the liquid and the atmospheric pressure. Depending on the conditions under which distillation is carried out, it is divided into simple distillation and molecular distillation methods.

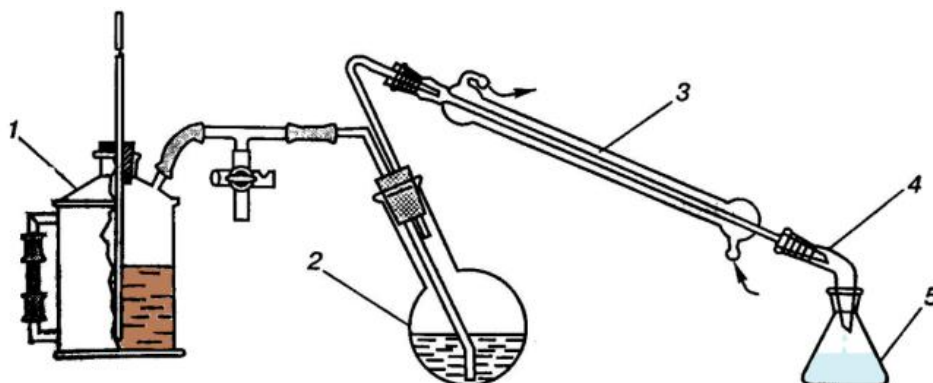
Simple distillation. The essence of this method is that the liquid is heated to the boiling point and its vapors condense in a refrigerator, forming a distillate. The simple distillation method is used for liquids with a boiling point of 40°C to 180°C. Since most organic liquids partially decompose at high temperatures, this method cannot be used for them.

The following devices are used to carry out the simple distillation method: distillation flask, refrigerator, allonge, thermometer, collecting flasks, and in addition, a heat source: a gas burner or electric stove must be present.



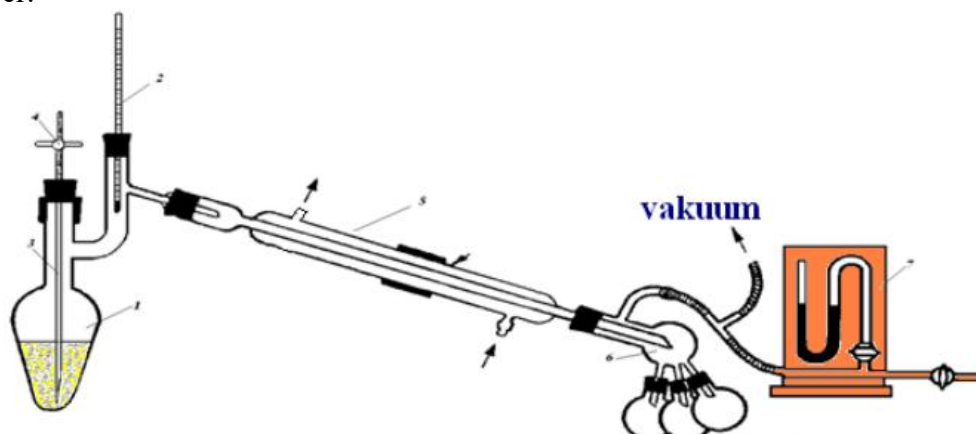
1-Rasm. Suyuqliklarni oddiy haydash uchun ishlatiladigan asbob: 1) Bunzen gorelkasi, 2) haydash kolba (Vyurskolbasi), 3) lapka, 4) termometr, 5) shtativlar, 6) Libix Sovitqichi 7) allonj, 8) yig'gich kolba

Steam distillation is a method of separating mixtures and purifying substances. In laboratories and technical applications, steam distillation is used to separate some substances from mixtures that are poorly soluble in water, do not react with water, and are unstable at their boiling points.



2-Rasm. Suyuqlarni suv bug'i bilan haydash uchun ishlatiladigan asbob: 1) suv bug'i hosil qiluvchi kolba, 2) haydash kolbasi, 3) sovitgich, 4) alonj, 5) yig'gich kolba

A round-bottomed flask is used as a driving flask. It is closed with a stopper, on one side of which is a tube connected to a flask that generates water vapor, and on the other side, glass tubes connected to a condenser.



3-Rasm. Vakuumli haydash qurilmasi 1- o'tkir tubli (haydash uchun) Klyayzen kolbasi; 2-termometr; 3- kapillyar; 4-qisqich; 5- sovutgich (Libix); 6-pauk (yig'gich); 7-simob ustunini ko'rsatuvchi asbob

Checking the results of the experiment and compiling a report.

When conducting laboratory work, it is necessary to accurately perform measurements and weighing. It is necessary that the material balances meet the requirements and the permissible errors do not exceed 0.10-1.6 percent. In order for the calculations to be correct, accurate measurements and recalculations are necessary. After the work is completed, the following report must be submitted:

- 1) The purpose of the work, the procedure for carrying out the work.
- 2) Description of the device and schemes.
- 3) Description of the experiment.
- 4) Conditions for conducting the experiment ($R > T$).
- 5) Material balance of the process.
- 6) Characteristics of the resulting products.
- 7) Conclusion.
- 8) References.

REFERENCES:

1. A. Abdusamatov "Organic chemistry" Tashkent "Talqin" 2005.

- 2.Z.Sobirov "Organikkimyo" Tashkent "Alokachi" 2005.
- 3.Abdusamatov A., Mirzayev R., Ziyayev R. Organic chemistry - Tashkent: Teacher, 2012 - P. 190 - 198
- 4.B. Umarov, // Organic chemistry, textbook, Tashkent "IQTISODMOLIYA" 2007
- 5.Eshmukhamedov M.A., Yodgorov N., Mominov Q., Abidov B., Mukhiddinov X.Kh. Classification and nomenclature of organic compounds. -T.: TDTU. 2008.