



VALIDATION OF THE RACING OF VOLATILE HAZARDOUS SUBSTANCES WITH STEAM

Mahmudov Husanboy Usarbek ugli

Tolibjonov Muhammadyusuf Gulomjon ugli

Samarkand State University of Veterinary Medicine, Animal
Husbandry and Biotechnology, Animal Husbandry and
Biotechnology University, Faculty of Animal Science, Group
202

Scientific supervisor: **Ubaydullayeva Gulchehra
Bahriddinovna**

Abstract. Validation of the distillation of volatile hazardous substances with steam is an important stage in ensuring the quality and safety of products obtained in this way. Key aspects of this process include: 1. Determining Distillation Parameters: It is essential to establish optimal conditions such as temperature, pressure, and the ratio of water to volatile substances to maximize extraction efficiency and minimize losses. 2. Equipment Selection: It is important to use appropriate distillation units that can provide stable and reproducible distillation conditions. 3. Contamination Issues: Careful monitoring for potential contamination of the final product is necessary, along with the implementation of control measures. 4. Result Analysis: All obtained results must be analyzed using suitable methods, such as gas chromatography, to ensure the quality and purity of the final product. 5. Documentation and Standardization: It is crucial to maintain thorough documentation of all stages of the process and validation actions to comply with quality standards and regulatory requirements.

Key words: volatile poisons, distillation, validation, standardization.

Introduction. The validation of the distillation of volatile hazardous substances with steam in the context of forensic chemistry is a critically important process, as it requires strict standards and procedures to ensure the credibility and reliability of results. Here are the main stages and aspects to pay attention to:

1. Purpose of Distillation: In the context of forensic chemistry, the steam distillation of volatile substances can be used to extract potentially toxic components from samples (e.g., tissues, blood, urine). It is important to clearly define the purpose of the analysis and which substances need to be isolated.

2. Methodology: Validation includes the development and justification of the distillation method. This involves:

- Optimizing distillation conditions (temperature, flow rate of vapors, etc.).
- Verifying the ability to isolate specific compounds without destroying their structure.

3. Calibration and Standardization:** Before beginning validation, standards should be used to calibrate equipment to ensure the results are comparable. The use of control samples will help confirm the accuracy and adequacy of the method.

4. Repeatability and Reproducibility:** It is crucial to conduct a series of tests to confirm that the method yields consistent results under different conditions and with different operators.

5. Data Analysis: The use of qualitative and quantitative analytical methods, such as gas chromatography or mass spectrometry, to determine the presence and concentration of volatile toxins.

6. Documentation: All results and data must be documented, which is necessary for legal proceedings. It is essential to compile protocols detailing each stage of validation.

7. Compliance with Standards: Focus should be on international and national standards (e.g., ISO or ASTM) to ensure that the method meets the requirements of forensic chemistry.

8. Staff Training: It is important that personnel conducting the validation are well trained and knowledgeable about all aspects of the process.

The isolation of volatile toxins in forensic toxicology is an important process that allows for the determination of the presence and concentration of toxic substances in samples.

Materials and Methods.

Samples:

- Biological fluids (blood, urine, saliva);
- Tissues (forensic samples);
- Other organic materials (residues from burned materials, liquids from bottles, etc.).

Chemicals and Reagents:

- Standards of volatile compounds;
- Specific reagents for analysis (e.g., acidic or alkaline solutions for purification).

Equipment:

- Distillation units (e.g., distillation flasks);
- Chromatographs (gas or liquid chromatography);
- Mass spectrometers for identifying isolated substances.

Extraction Methods:

1. Steam Distillation:

- The process involves passing steam through the sample, leading to the evaporation of volatile substances. The steam is subsequently condensed, and the volatile components are collected in a separate fraction.

- This method effectively isolates compounds with low boiling points.

2. Sublimation:

- Used to extract volatile compounds that can sublime under certain conditions. The sublimated substances are collected on cooled surfaces.

3. Solvent Extraction:

- The use of organic solvents to extract volatile components from samples. Solvents such as chloroform, ether, or acetone are used. This allows for the extraction of toxic substances that do not respond to standard distillation.

4. Headspace Method:

- Analysis of vapors above the sample in a closed container. These vapors can be collected and analyzed without direct contact with the sample, reducing the risk of contamination.

5. Ultrasonic Extraction:

- This method is employed to enhance extraction efficiency, where the sample is subjected to ultrasonic vibrations in the presence of a solvent.

6. Adsorption Methods:

- The use of solid adsorbents (e.g., activated carbon filtration) to capture volatile compounds from the gas phase.

Conclusion. Each of these methods has its advantages and limitations, and the choice depends on the specific circumstances, type of sample, and objectives of the analysis. It is also important to adhere to strict protocols and standards to ensure that the results are reliable and admissible in legal proceedings.

References

1. Zhang H. et al. Immunoassay technology: Research progress in microcystin-LR detection in water samples //Journal of Hazardous Materials. – 2022. – T. 424. – С. 127406.
authier L., Plebani M., Favresse J. Interferences in immunoassays: review and practical algorithm //Clinical Chemistry and Laboratory Medicine (CCLM). – 2022. – T. 60. – №. 6. – С. 808-820.
абиева Н. А. ИСТОРИЯ, СОВРЕМЕННОЕ СОСТОЯНИЕ И ПЕРСПЕКТИВЫ РАЗВИТИЯ СУДЕБНО-ХИМИЧЕСКОГО ОТДЕЛЕНИЯ ГАУЗ «РБСМЭ МЗ РТ» //АКТУАЛЬНЫЕ ВОПРОСЫ СУДЕБНОЙ МЕДИЦИНЫ И ПРАВА. – 2022. – С. 10-19..

4. Байкулов А. К., Муртазаева Н. К., Тошбоев Ф. Н. ДИНАМИКА ВЛИЯНИЯ ЛАКТАТДЕГИДРОГЕНАЗЫ ПРИ ЭКСПЕРИМЕНТАЛЬНОМ ИНФАРКТЕ МИОКАРДА //World of Scientific news in Science. – 2024. – Т. 2. – №. 2. – С. 937-947.
айкулов А. К., Убайдуллаева Г. Б., Эшбуриева Б. Р. Коррекция экспериментальной гиперлипотеинемии с производными хитозана //World of Scientific news in Science. – 2024. – Т. 2. – №. 2. – С. 937-947.
enjayevich B. A. et al. EKSPERIMENTAL GIPERHOMOSISTEINEMIYANI OKSIDLOVCHI STRESS HOLATIDA KELITIRIB CHIQARISH //TADQIQOTLAR. UZ. – 2024. – Т. 40. – №. 1. – С. 25-30.
rmanov R. T., Qarshiev S. M., Baykulov A. K. CHANGES IN THE NITRERGIC SYSTEM DURING EXPERIMENTAL HYPERCHOLESTEROLEMIA //World of Scientific news in Science. – 2024. – Т. 2. – №. 4. – С. 326-339.
8. Akhmadov J. Z., Akramov D. K., Baykulov A. K. Chemical composition of essential oil lagochilus setulosus //Modern Scientific Research International Scientific Journal. – 2024. – Т. 2. – №. 1. – С. 263-269.
9. Bayqulov A. K., Raxmonov F. K., Egamberdiyev K. E. Indicators of endogenous intoxication in the model of burn injury in correction with chitosan derivatives //Educational Research in Universal Sciences. – 2022. – Т. 1. – №. 2. – С. 56-63.
10. Baykulov A. K., Norberdiyev S. S. eksperimental giperxolesterolemiyada qondagi gomosistein miqdori bilan endoteliy disfunktsiyasi bog 'liligi //Educational Research in Universal Sciences. – 2023. – Т. 2. – №. 3 SPECIAL. – С. 396-402.
11. Советов К. Т., Байкулов А. К. Динамика ИБС с коррекцией ЛДГ //Modern Scientific Research International Scientific Journal. – 2023. – Т. 1. – №. 9. – С. 47-55.

12. Байкулов А. К., Юсуфов Р. Ф., Рузиев К. А. Зависимость дисфункции эндотелия с содержанием гомоцистеина в крови при экспериментальной гиперхолестеринемии //образование наука и инновационные идеи в мире. – 2023. – Т. 17. – №. 1. – С. 101-107.
13. Kenjayevich B. A. et al. Changes of basic intermediates in blood in myocardial infarction //Journal of Positive School Psychology. – 2022. – С. 1775-1781.
14. Байкулов А. К. и др. Показатели системы оксида азота при экспериментальной гиперхолестеринемии //International Scientific and Practical Conference World science. – ROST, 2017. – Т. 4. – №. 12. – С. 5-8.
15. Kenjayevich B. A. et al. TIOKSIKOLOGIK KIMYODA ATOM-ABSORBSION SPEKTROSKOPIYA USULLARI //Yangi O'zbekiston taraqqiyotida tadqiqotlarni o'rni va rivojlanish omillari. – 2024. – Т. 12. – №. 1. – С. 101-106.
16. Kenjayevich B. A. et al. VISMUT ELEMENTINING TOKSIKOLOGIK AHAMIYATI //Yangi O'zbekiston taraqqiyotida tadqiqotlarni o'rni va rivojlanish omillari. – 2024. – Т. 12. – №. 1. – С. 82-86.
17. Kenjayevich B. A. et al. YALLIG'LANISHGA QARSHI NOSTEROID DORI VOSITALARI TOKSIKOLOGIK AHAMIYATI //Ta'limning zamonaviy transformatsiyasi. – 2024. – Т. 12. – №. 2. – С. 38-43.
18. Anvar o'g'li O. A., Kenjayevich B. A. SUD KIMYOSI EKSPERTIZA LABAROTORIYALARDA QÒLLANILADIGAN DASTLABKI EKSPRESS TAXLIL USULLARI //Ta'limning zamonaviy transformatsiyasi. – 2024. – Т. 12. – №. 2. – С. 44-48.
19. Muzaffar o'g'li A. M., Kenjayevich B. A. DORIVOR ÒSIMLIKLAR BILAN ZAHARLANISH HOLATLARI //Ta'limning zamonaviy transformatsiyasi. – 2024. – Т. 12. – №. 2. – С. 58-61.

20. Kenjayevich B. A., Nematjon o'g'li T. D., Rashidovna E. B. SOURCES OF ALKALOIDS AND EFFECTS ON THE BODY //TADQIQOTLAR. UZ. – 2024. – T. 40. – №. 1. – C. 31-35.