

RADIOMETERS, THEIR IMPORTANCE IN THE MEDICAL AND PHARMACEUTICAL INDUSTRIES

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Relevance. In the rapidly developing medical and pharmaceutical industries of today, sources of ionizing radiation (radionuclides, radiopharmaceuticals) are being extensively utilized. In this context, ensuring the radiation safety of both the production environment and finished products represents a highly relevant necessity. It is expedient to appropriately utilize ionizing radiation in pharmaceuticals and treatment, introduce new informative diagnostic methods into clinical practice, and enhance the sensitivity and specificity of currently applied methods. Active radio-optics/radiometry (RR) stands out as one of the promising diagnostic technologies for use in internal medicine clinics [1,2]. Radiometers serve as the primary hygienic control instruments that determine the radiation activity and radioactive contamination of environmental objects, biological fluids, and medicinal products.

Research Objective. To hygienically evaluate and summarize the applications of radiometers in medicine and the pharmaceutical industry based on the analysis of local and international scientific literature.

Materials and Methods. The conducted research utilized the current sanitary regulations of the Republic of Uzbekistan (SanPiN № 0056-20) [3], scientific articles by scholars in the fields of nuclear physics and pharmacy, as well as methods of retrospective and comparative analysis of regulatory legal documents controlling the safety of medicines in our republic.

Literature Review and Discussion. Radiometric instruments serve as a leading tool in medical practice, particularly in nuclear medicine and radiobiology laboratories when working with open radiation sources, for the continuous

evaluation of radioactive contamination on the surfaces of medical personnel's workplaces. According to research, establishing a continuous radiometric monitoring system in medical institutions minimizes the internal radiation dose of personnel and allows for maintaining the standard hygienic condition of the premises. Furthermore, the role of modern radiometric detectors is invaluable in accurately configuring the doses of X-rays and gamma rays used in radiation diagnostics and therapy, as well as in conducting quality control of the equipment.

The importance of radiometers in the pharmaceutical industry also possesses distinctive characteristics. Currently, the production of radiopharmaceutical drugs used in the diagnosis (PET-CT) and treatment of oncological diseases, along with the measurement of their specific activity, is directly carried out using radiometric calibrators. Scientists active in the pharmaceutical field emphasize that the radiation purity and quality of medicinal products must strictly comply with international GMP (Good Manufacturing Practice) standards and state pharmacopeia requirements, which, in turn, necessitates continuous radiometric testing [4].

Conclusion. The scientific literature review demonstrates that radiometers in the medical and pharmaceutical industries serve not only as technical measuring instruments but also as an integral part of a fundamental monitoring system aimed at controlling the quality of high-tech medicines and ensuring the radiation safety of workforce personnel and the general public.

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