Abstract

This research investigates the effect of radiation ionizers on human tissues, focusing on the application of radiochromatography as a precise analytical technique for separating, identifying, and analyzing radiolabeled compounds. The study explores the principles and types of radiochromatography, including Thin Layer Chromatography (TLC), High-Performance Liquid Chromatography (HPLC), and Gas Chromatography (GC), highlighting their critical roles in medical diagnostics, pharmaceutical quality control, and environmental monitoring.

The research also delves into modern radiolabeling techniques, advanced radiation detection methods, and the applications of radiochromatography in tracking radioactive materials within biological systems. Key advantages such as high sensitivity, accuracy, and versatility are discussed alongside challenges like radiation safety risks, high equipment costs, and environmental concerns related to radioactive waste.

Additionally, the role of medical physicists in enhancing radiological safety and the potential of artificial intelligence (AI) in improving radiological data analysis are explored. The study concludes that radiochromatography remains an indispensable tool in scientific research and clinical practice, with continuous technological advancements expected to overcome current limitations and expand its applications in the future.