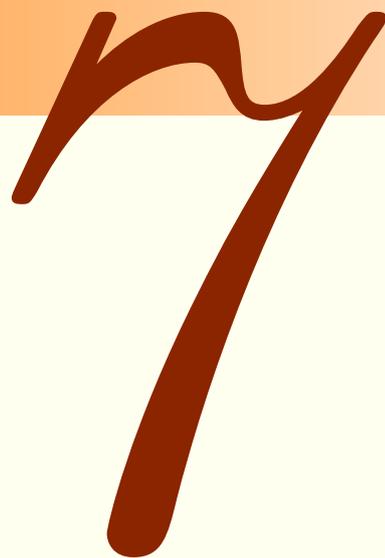


Radiochemistry

PROFESSOR
IGOR N. BECKMAN

RADIATION AND
NUCLEAR MEDICINE:
physical and chemical aspects



I.N.Beckman

**RADIATION AND NUCLEAR MEDICINE:
PHYSICAL AND CHEMICAL ASPECTS**

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A text-book series in Postgraduate Education

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Abstract

“Radiation and nuclear medicine: physical and chemical aspects” is the 7th volume in popular *“Radiochemistry”* text-book series, authored by prof. I. Beckman. This volume is dedicated to clinical applications of ionizing radiation and radionuclides. The author describes their usage in modern diagnostics, surgery and therapy and provides numerous practical examples to the reader. **Part I** describes the phenomenon of radioactivity, nuclear reactions, interactions of ionizing radiation with matter and biological effects of radiation. Current national and international radiation safety guidelines and sanitary standards are provided. **Part II** of the text-book is dedicated to methods of radiation diagnostics (planar X-ray imaging and CT scans) and therapy (X-ray-, γ -, and hadron therapy; radiosurgery, brachytherapy). **Part III** contains essential information on radionuclide diagnostics and therapy. The author describes the theoretical foundations, equipment and applications of scintigraphy, radioimmunoassays, single-photon emission computed tomography, positron emission tomography and kinetic methods. Methods and equipment for production of short-lived radioisotopes, as well as synthesis of radiopharmaceuticals are all outlined in the concluding chapters of present volume. The author reviews techniques which are currently employed in radiation and nuclear medicine as well as their applications in diagnostics and therapy of malignant tumors.

The volume has been written as an accompanying text-book for post-graduate students, taking advanced courses in chemistry and physics. However, it can be used a reference book by researchers working with radiation and by everyone who is interested in ionizing radiation, radioisotopes and their medical applications.

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Radiation is particularly associated with nuclear medicine and the use of nuclear energy, along with X-rays, is ionising radiation. Another valuable report, titled Low-level Radiation and its Implications for Fukushima Recovery, was published in June 2012 by the American Nuclear Society. In 2012 UNSCEAR reported to the UN General Assembly on radiation effects. The health effects of exposure both to radiation and to chemical cancer-inducing agents or toxins must be considered in relation to time. There is cause for concern not only about the effects on people presently living, but also about the cumulative effects that actions today might have over many generations. Nuclear Medicine physics and radiation oncology have an entire volume devoted in this discussion background text. This encyclopedia and principle resource should help nuclear physics specialists. (Joseph J. Grenier, Amazon.com, September, 2015). From the reviews of the 1st Edition Therefore the publication of the Handbook of Nuclear Chemistry, which authoritatively surveys all of the chemical aspects of the dynamic field of nuclear science is most welcome. contains hundreds of tables, figures, and mathematical and nuclear equations. The extensive selection of references provides access to further reading in the field. is an invaluable, comprehensive, and cutting-edge reference for nuclear scientists, chemists, biologists, physicists. Nuclear Medicine Physics. Article in Medical Physics 38(8) August 2011 with 8 Reads. How we measure 'reads'. A 'read' is counted each time someone views a publication summary (such as the title, abstract, and list of authors), clicks on a figure, or views or downloads the full-text. Introduction, J.J. Pedroso de Lima Cyclotron and Radionuclide Production, Francisco J.C. Alves The Quantitative Aspects of Radionuclide Production The Cyclotron: Physics and Acceleration Principles Positron Physics, Adriano Pedroso de Lima and Paulo M. Gordo The Physical and Chemical Aspects of the Positron and Positronium in Matter Perspectives on the Medical Applications of Positrons Radiopharmaceuticals: Development and Main Applications, Antero Abrunhosa and.