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Radiological Protection

Editors:
A. Kaul, D. Becker

Authors:
D. Becker, G. Brix, A. Dalheimer, G. Dietze, H.R. Doerfel,
K.F. Eckerman, H. Graffunder, Y. Harima, K. Hayashi,
N. Ishigure, A. Kaul, H. Klewe-Nebenius, M. Lasch, H. Paretzke,
N. Petoussi-Henss, A. Phipps, H. Smith, J.W. Stather, G.N. Stradling,
D.M. Taylor, H.-G. Vogt, W. Weiss

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Preface

About 10 years before discovery of X-rays and natural radioactivity by W. C. Röntgen and H. Becquerel, more precisely in 1883, Hans Landolt, Richard Börnstein and Julius Springer have started a series of selected and easily retrievable physical data, which became a successful tool for natural scientists working or practising a profession in fields of chemistry, physics or technology.
Now, i.e. about 120 years after start of this unique data collection and consequently about 100 years after introduction of ionizing radiations and radionuclides in natural sciences, medicine and technology, the Landolt-Börnstein New Series is submitting to the reader a full volume on protection of man against ionizing radiations and radionuclides, i.e. "Radiological Protection". A comparison with the 6th edition of Landolt-Börnstein containing merely a six pages chapter on "Strahlenschutz" shows the rapid development of the field within the last five decades.
Compared to many of the volumes in the Landolt-Börnstein Series published in the past, the present publication in the group Advanced Materials and Technologies is not only a compilation of numerical data and functional relationships for practical purposes. Rather a comprehensive accompanying text is intended to impart to the scientific or professional user of "Radiological Protection" both data, the concepts and scientific bases of the discipline devoted to prevention of health risks to man from exposure to ionizing radiations and radionuclides.
Conceptually, radiological protection is based on the principles of *justification* of any use of ionizing radiation, of *optimization* of the application of radiation, and *limitation* of the radiation risk to man and his environment by acceptable doses, so that use of radiation and radionuclides in scientific research, medicine, technique and daily life is always of net benefit to man.
Since findings of various scientific disciplines such as medicine, biology, biophysics, nuclear physics and techniques are the basis for radiological protection, multidisciplinary knowledge of fundamentals of these disciplines is necessary for an effective protection of man against health effects of ionizing radiations. Consequently, the present volume contains contributions of experts internationally qualified in scientific disciplines or subjects such as radiation physics, biology and medicine, external and internal dosimetry of ionizing radiation and radionuclides, decontamination and decorporation of radionuclides, or physical and biological measuring techniques. Although a previous volume in the Landolt-Börnstein Series has already considered shielding against high energy radiation such as of accelerators or of cosmic origin the specific item of assessment of radiation shielding was treated, too, however restricted to an extent being necessary for completion of tasks of practical radiological protection, specifically in the field of lower energies.
The present volume addresses to

- those already working in radiological protection, under the aspect of making available to them numerical data and functional relationships e.g. on assessment of radiation doses from external and internal sources, or with the aim of further education and impartation of most recent knowledge in radiological protection and scientific disciplines behind;
- those participating in post-graduate education programmes in radiological protection with the aim to get a qualified expert e.g. in medical radiation physics, or as an employee in a competent national authority for health protection;
- newcomers in the field of radiological protection to submit necessary knowledge on bases and practices of this discipline;
- advanced students of physics, techniques or medicine with special interest in a later professional occupation as health physicists, engineers or technicians;
- physicians practising in X-ray diagnostics, radiation oncology and nuclear medicine with special interest in medical radiological protection.

In the hardcopy of the present volume a CD-ROM is included containing:

- the full text in the multi-platform Adobe-Acrobat(pdf)-format with searchable fulltext index and

- additional information and data, which would be beyond the scope of the printed version, within the interactive programme **SISy** (for MS-Windows only). These refer e.g. to decay data of radionuclides or normalized excretion functions for monitoring workers by quantitative assessment of intakes of radionuclides and calculation of resulting doses.

For further numerical data such as dose coefficients for intake of radionuclides by workers or members of the public that are available from publications e.g. of the International Commission on Radiological Protection ICRP or of the International Commission on Radiation Units and Measurements ICRU either as hardcopies or in the Internet are not contained on the CD-ROM. The reader is referred to the relevant original sources.

The editors of the present volume want to thank the authors of the contributions for their careful work, the Editor in Chief of the Landolt-Börnstein Series, Prof. Dr. W. Martienssen, for having put "Radiological Protection" on the list of volumes to be prepared for the New Series, and the Publisher, especially Drs. Ch. Meier and R. Poerschke from the editorial office for their permanent and very active engagement in realizing the present opus.

The Editors Braunschweig/Salzgitter, 2004

Editors

D. Becker
Bundesamt für Strahlenschutz
Fachbereich KT 2
Willy-Brandt-Straße 5
38226 Salzgitter-Lebenstedt
GERMANY

A. Kaul
Physikalisch-Technische Bundesanstalt
Bundesallee 100
38116 Braunschweig
GERMANY

Authors

D. Becker
Bundesamt für Strahlenschutz
Fachbereich KT 2
Willy-Brandt-Straße 5
38226 Salzgitter-Lebenstedt
GERMANY
1 Intoduction

G. Brix
Bundesamt für Strahlenschutz
Institut für Strahlenhygiene
Ingolstädter Landstraße 1
Neuherberg
85764 Oberschleißheim
GERMANY
10 Measuring techniques

A. Dalheimer
Bundesamt für Strahlenschutz
Fachbereich Strahlenschutz und Gesundheit
Köpenicker Allee 120-130
10318 Berlin
GERMANY
10 Measuring techniques

G. Dietze
Physikalisch-Technische Bundesanstalt
Abt. 6
Bundesallee 100
38116 Braunschweig
GERMANY
4 Radiological quantities and units
10 Measuring techniques

H.R. Doerfel
Forschungszentrum Karlsruhe
Hauptabteilung Sicherheit
Postfach 3640
76021 Karlsruhe
GERMANY
10 Measuring techniques

K.F. Eckerman
Health Sciences Research Division
Oak Ridge National Laboratory
1060 Commerce Park
Oak Ridge
Tennessee 37831-6480
USA
7 Internal dosimetry of radionuclides

H. Graffunder
Ingenieurbüro Graffunder
Friedrichstraße 28
76297 Stutensee
GERMANY
Radiation Protection Information System (SISy)

Y. Harima
Tokyo Institute of Tecnology
Research Laboratory for Nuclear Reactors
7-3-4-307 Hikarigaoka
Nerima-ku
Tokyo
179-0072 JAPAN
5 Shielding against ionizing radiation

K. Hayashi
Hitachi, Ltd.
Nuclear Plant Engineering Department
Saiwai-cho, 3-1-1, Hitachi, Ibaraki,
317-8511 JAPAN
5 Shielding against ionizing radiation

N. Ishigure
Research Center for Radiation Safety
National Institute of Radiological Science
4-9-1, Anagawa, Inage, Chiba
263-8555 JAPAN
7 Internal dosimetry of radionuclides

A. Kaul
Physikalisch-Technische Bundesanstalt
Bundesallee 100
38116 Braunschweig
GERMANY
1 Introduction
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H. Klewe-Nebenius
Forschungszentrum Karlsruhe
Institut für Instrumentelle Analytik
Postfach 3640
76021 Karlsruhe
GERMANY
3 Physical fundamentals

M. Lasch
Kernkraftwerke Grundremmingen
Betriebsgesellschaft mbH
Postfach
89355 Grundremmingen
GERMANY
8 Decontamination

H.G. Paretzke
Institut für Strahlenschutz
GSF-Forschungszentrum für Umwelt
und Gesundheit, GmbH
Neuherberg, Postfach 11 29
85758 Oberschleißheim
GERMANY
6 External dosimetry

N. Petoussi-Henss
Institut für Strahlenschutz
GSF-Forschungszentrum für Umwelt
und Gesundheit, GmbH
Neuherberg, Postfach 11 29
85758 Oberschleißheim
GERMANY
6 External dosimetry

A. Phipps
National Radiological Protection Board
Chilton
Didcot
Oxfordshire OX11 ORQ
UNITED KINGDOM
7 Internal dosimetry of radionuclides

H. Smith †
National Radiological Protection Board
Chilton
Didcot
Oxfordshire OX11 ORQ
UNITED KINGDOM
2 Biological effects of ionising radiation

J.W. Stather
National Radiological Protection Board
Chilton
Didcot
Oxfordshire OX11 ORQ
UNITED KINGDOM
2 Biological effects of ionising radiation
7 Internal dosimetry of radionuclides

G.N. Stradling
National Radiological Protection Board
Chilton
Didcot
Oxfordshire OX11 0RQ
UNITED KINGDOM
9 Decorporation of radionuclides

D.M. Taylor
5, Pan Poeth
Pen-y-bont, CF31 5BD
Wales
UNITED KINGDOM
9 Decorporation of radionuclides

H.-G. Vogt
Zentrum für Strahlenschutz und Radioökologie
Universität Hannover
Am Kleinen Felde 30
30167 Hannover
GERMANY
5 Shielding against ionizing radiation

W. Weiss
Bundesamt für Strahlenschutz
Fachbereich Strahlenhygiene
Institut für Strahlenhygiene
Ingolstädter Landstr. 1
85764 Oberschleißheim
GERMANY
10 Measuring techniques

Landolt-Börnstein

Editorial Office
Gagernstr. 8, D-64283 Darmstadt, Germany
fax: +49 (6151) 171760
e-mail: lb@springer-sbm.com

Internet
http://www.landolt-boernstein.com

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