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Numerical Data and Functional Relationships
in Science and Technology

New Series

Editor in Chief: W. Martienssen

Units and Fundamental Constants in Physics and Chemistry

Elementary Particles, Nuclei and Atoms (Group I)

(Formerly: Nuclear and Particle Physics)

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Biophysics (Group VII)

*Some of the group names have been changed according to a better
description of their contents*

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Volume 16

Low Energy Neutron Physics

Subvolume B
Tables of Neutron Resonance Parameters

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Edited by H. Schopper



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Preface

There is no other particle than the neutron which has attracted so much interest, both in fundamental physics and for applications. It is one of the basic building blocks of matter and therefore plays a major role in nuclear and elementary particle physics, astrophysics and cosmology. It is used for neutron activation analysis in many domains, neutron scattering and diffraction are essential tools in condensed matter physics, biology and material testing and, of course, neutrons are the basis for energy production in nuclear fission and fusion, be it in power stations or in the nuclear bomb.

Because no larger compilation of neutron data has appeared since more than 10 years it seemed necessary, in particular for applications, to publish a most up-to-date collection of such data. The present compilation is limited to 'slow' neutrons which means neutrons with energies lower than 20 MeV, with the emphasis on really slow neutrons, i.e. below the keV range.

There is such an abundance of experimental data, a large part of it produced during the last 10 or 15 years, that it had to be distributed over three volumes. The fundamental properties of the neutron, the cross sections for various neutron reactions and some overall parameters of resonances are reproduced in the two subvolumes I/16A, Part 1 and Part 2, whereas this Volume I/16B is completely dedicated to the data of neutron resonance parameters. However, because of the enormous amount of data it was not possible to reproduce all data in printing. Therefore the most important and recent data for each isotope are published in the 'Main Part of the Neutron Resonance parameters File' (MP NRF) of this book whereas parameter sets for resonances at higher energies are contained in an 'Additional Part'(AP NRF) which is presented on CD-ROM as Supplement.

It was possible to secure the collaboration of one of the most competent group of authors in this field. Working in Russia gave them the opportunity to include in this compilation data which usually are not easily accessible, but on the other hand their international connections provided the guaranty that all data, no matter where they were produced, were taken into account. I would like to thank the authors for their careful work and their flexibility to comply with the wishes of the editor and publisher. Thanks are also due to the members of the Landolt-Börnstein editorial staff who have made major contributions to the successful and timely production of this volume.

Geneva, February 1998

The Editor