

**BOOK REVIEW**

**Table of Isotopes (8th Edition), R.B. Freestone and the late V.S. Shirley (eds). Volumes I and II. J. Wiley and Sons Ltd., Chichester, 1996.**

This massive two volume work, edited and updated by two distinguished scientists (sadly Mrs Shirley died shortly before its publication) comes with an interactive CD-ROM that contains nuclear structure and decay data for over 3,100 isotopes and isomers with mass numbers varying from 1 to 272. There have been important changes since the previous edition was published - a 50% expansion of material, greater emphasis on nuclear structure data and completely re-written appendices; data from close on 24,000 references are cited.

This edition is also organised by mass number (A) and sub-ordered by atomic number (Z). It contains a wealth of data. Thus for each mass chain there is an abbreviated summary decay scheme drawing summarising the ground state and isomeric state(s) half lives, spin and parity assignments and ground state decay branchings, decay energies, and the proton and neutron separation energies for all known isotopes and isomers of that mass.

The scheme is followed by tabular listings for each isotope; interspersed are the decay scheme and band structure drawings. The tables contain general nuclear properties including natural isotopic abundance, mass excess, decay Q-values, proton and neutron separation energies, and neutron capture cross sections. These are followed by an alphabetically coded list of the decay modes and reactions known or expected to populate the isotope. The table continues with an energy-ordered list of level data and  $\gamma$ -ray deexcitation information, adopted from decay and reaction measurement. Adopted level data include spin and parity, isospin, half-life, decay modes and branching intensities, dipole and quadrupole moments, and cross-indexing to the populating reactions and decays in which the level is observed. The data listed for the  $\gamma$ -rays include energy, relative photon intensity normalised to 100 for the most intense photon branch from a given level, multipolarity, and mixing ratio. Radioactive decay data tables for the isotope and its isomers follow each adopted levels table. These provide tables of transition energies, relative intensities and absolute intensity normalisations for  $\alpha$ , p, n, or other particles emitted in decay.

A composite decay scheme drawing summarises information from all decay modes feeding each daughter isotope. Such drawings show each parent's level energy, spin, parity, half-life, and decay energy. Beta or alpha decay feedings to daughter levels are shown with their associated reduced transition probabilities. All  $\gamma$  rays from the levels populated by decay are shown with their energies, multipolarities and relative branching intensities from the adopted levels table. Levels identified as having associated collective or high-spin structure are shown in nuclear band drawings. There, bands are drawn side by side and given a short band name if available. In-band  $\gamma$  rays, with their energies rounded to the nearest keV, and transitions to adjacent bands (arrows only) are shown. The existence of additional transition(s) that are not shown is indicated by an arrowhead on the level.

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The two volume work is therefore a mine of information which should be available in the libraries of all universities where research involving of isotopes is being pursued. The editors and their team of assistant editors are to be congratulated on bringing this complex task to fruition.

The CD-ROM version is specially designed for use on PC and Mackintosh personal computers and UNIX workstations. Data are indexed for rapid access from a chart of the nuclides graphical index and from separate indices organised for applied radioisotope users and nuclear structure physicists. Hypertext links move the user quickly through related information. Free from the limitations of page size, the data is presented more completely in a form that is easy to read on any monitor. Complete references with keyword abstracts are provided along with more extensive appendices. The Adobe Acrobat Reader is provided for navigating the CD-ROM, prints to nearly all printers, and even allows clipping of information into other documents.

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