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X-ray and gamma-ray standards for detector calibration

Data (version of 91-12-6) **by an IAEA Coordinated Research Project**

Program (version 1.2 of 94-10-9) **by Hartmut Lemmel**

Abstract: A PC diskette is described which contains for selected nuclides their helf-lives and the energies and emission probabilities of gamma-rays and X-rays suitable for detector and efficiency calibration. The diskette is available upon request, costfree, from the IAEA Nuclear Data Section.

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International Atomic Energy Agency, Nuclear Data Section

"XG Standards"
Version 1.2, 94-10-9

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X-RAY AND GAMMA-RAY STANDARDS FOR DETECTOR CALIBRATION

Introduction

This PC file includes the recommended values of decay parameters of selected radionucides to be used for X-ray and gamma-ray detector efficiency calibration. The data are the result of the work of an IAEA Co-ordinated Research Project 1986 to 1990 with the following participants: W. Bambynek, T. Barta, P. Christmas, N. Coursol, K. Debertin, R.G. Helmer, R. Jedlovszky, A.L. Nichols, F.J. Schima, Y. Yoshizawa, and with A. Lorenz and H.D. Lemmel as IAEA Scientific Secretaries. The work has been published in IAEA-TECDOC-619 (1991).

The PC diskette presents for the selected radionuclides three tables for the recommended standard values and uncertainties (standard deviations) of their

half-lives,
energies and emission probabilities of X-rays, and
energies and emission probabilities of gamma-rays.

The data are shown in either nuclide sort or energy sort. Users who want to use only some of the radionuclides, may mark their preferred nuclides so that they obtain a selective retrieval either on the screen or on the printer.

Notes:

1. The Greek characters gamma and eta that occur in the file, are usually not available on the screen or printer. The XG program creates these signs for certain screen types. On other screens and on printers they will show up as capital gamma (ASCII 226), respectively as an eta-similar sign (ASCII 239).

2. In the X-ray table the energy column includes energy ranges; in the table sorted by energy the mean value of the energy range is used for sorting.

3. The data tables can be edited under dBase; should this be done, the index-files *.idx must be deleted so that XG will create new index-files. Do not modify the structure of the dBase files!

4. The diskette contains the data in the version of 1991-12-6 (superseding a preliminary version dated 91-8-6). The programme is in the version 1.2 dated 94-10-9, requiring about 85k memory (superseding the version 1.1 dated 91-12-6, requiring about 380k memory).

The diskette is available upon request, free of charge, from the IAEA Nuclear Data Section, P.O. Box 100, A-1400 Vienna, Austria.

The diskette contains 5 files.

XG_READ.ME	HL.DBF	GRAY.DBF
XG.EXE	XRAY.DBF	

The program is called by typing XG Enter.

The program will create two more files, i.e. index files XRAY.IDX and GRAY.IDX. (Should the index files get corrupted, delete them, and the program will again create new index files.) The 5 files plus the two index files have a size of 40 kbytes.

H.D. Lemmel
1994-10-9

Related Literature:

Gamma and X-ray Spectrometry with Semiconductor Detectors. K. Debertin and R.G. Helmer. Available for 180.- Dutch Florin from Elsevier Scientific Publishers, P.O. Box 211, NL-1000 Amsterdam, Netherlands.

- Chapter: 1. Background material
- Chapter: 2. Experimental set-up
- Chapter: 3. Spectrum analysis and energy measurements
- Chapter: 4. Efficiency calibration and emission-rate measurements
- Chapter: 5. Applications
- Chapter: 6. Atomic and nuclear data