

NEW INTERNATIONAL REACTOR DOSIMETRY FILE, IRDF-2002

The last tested version of the reactor dosimetry file IRDF-90 V2 was released in 1993. Most of the evaluations for this file were prepared in the mid-eighties. Since then a large number of new experimental data have been measured, and two new national reactor dosimetry libraries have been produced (RRDF-98 and JENDL/D-99). Reaction cross sections and uncertainties included in these libraries may be of better quality than the data in the older IRDF-90 file. Some laboratories have started to use data from the newer libraries, which is creating difficulties in comparing neutron fluences and spectra that have been evaluated using different dosimetry data. There are strong requests from the reactor dosimetry user community for an updated standardised version of the IRDF-90 file.

The objective of the project is to prepare and distribute standardised, updated and benchmarked neutron dosimetry reaction cross section library (IRDF-2002) for use in nuclear power lifetime management assessments.

Within the scope of the project the following tasks need to be considered:

1. Intercomparison of reactor dosimetry cross-section data and their uncertainties in various libraries including IRDF-90.2, JENDL/D-99 and RRDF-98. The reaction rates in a standard neutron field will be compared.
2. Select best data, based on the above comparison of data for IRDF-2002.
3. Evaluate and test new reaction cross sections requested by reactor dosimetry community for extension of the database.
4. Include in the files evaluated decay-radiation characteristics.
5. Comparison of experimental and calculated fission and thermal spectrum averaged cross sections
6. Benchmark the important dosimetry reactions (used for ex-vessel neutron spectrum unfolding) with data from full-scale measurements.

Present tasks under development or to be initiated during 2001:

E. Zsolnay, E. Szondy and H. J. Nolthenius

- a) Checking the correctness of the data in the new cross section files (IRDF-98 and JENDL-DF-99) from Format and Physics point of view.
- b) Intercomparison of the cross section and uncertainty information present in the files IRDF-90.2, RRDF-98 and JENDL-DF99.
- c) Analysis of the covariance information in the files RRDF-98 and JENDL-DF-99.
- d) Communicating the Format errors and other discrepancies (if found) to the evaluators of the new reactor dosimetry files via IAEA NDS. The evaluators should perform the requested modifications. After modification the procedures listed in points 1-3 have to be repeated.

K.I. Zolotarev and A. Pashchenko.

Evaluations of important dosimetry reactions like La-139(n, γ), W-186(n, γ) and Pb-204(n,n')Pb-204-m with covariance matrices of uncertainties and presently absent in IRDF92, RRDF-98 and JENDL-DOS are under evaluation .

Pronyaev and V. Zerkhin

Plots with comparison of cross sections from different libraries with available experimental data (renormalized to the latest standards where it is possible) .

W. Mannhart

Experimental fission spectrum (Cf-252(sf) and U-235 + n(thermal)averaged cross sections (with complete covariances) for about 30 dosimetry reactions for each spectrum
Comparison of experimental and calculated spectrum averaged cross sections

Claes Nordborg

Somebody else from EU may join the project later in May

L. R. Greenwood

May be providing damage data (e.g. dpa and gas production cross sections)

JAERI

Some participation is expected

We encourage indications of more participants.

A Consultant Meeting will take place early in 2002