

Correction of the Errors in the Recommended Files of the IAEA Photonuclear Data Library: Present Status

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29 January 2001, Rev. 1 - 22 May 2001, Rev. 2 - 8 November 2001

The correction of the errors in the recommended files of the IAEA Photonuclear Data Library and diagnosed by the ENDF utility codes (CHECKER and FIZCON) was done. Only format errors that did not require substantial revision of the files were corrected. The errors, which require substantial revision of the files, should be made by the authors of the evaluations. The summary of introduced corrections and list of errors that remain in the files is given below.

LANL files

Corrections:

- For C-12 and MF=6, MT=600 ZAP and AWP were corrected to ZAP=1.001+3 and AWP=9.9862-1.

Errors:

- No errors detected.

KAERI files

Corrections:

- For all files the upper incident gamma energy was corrected to 1.4E+8
- For 47-Ag-107, MF=6, MT=5, wrong value: the string “-NaN+*””, which on some machines appears as a result of undefined mathematical operation, was corrected to a value “7.57321-14” obtained by interpolation between neighboring points.
- For 50-Sn-114, MF=6, MT=5, wrong value: the string “-NaN+*””, which on some machines appears as a result of undefined mathematical operation, was corrected to a value “0.0+0”.

Errors:

- No errors detected after corrections.

BOFOD files

Corrections:

- For 90-Th-232, 92-U-233, 234, 235, 236, 238 and MF=1, MT=451 EMAX was corrected to 2.0+7 and LRP at -1 (no resonance parameters)
- For 90-Th-232, 92-U-233, 235, 238 section MF=2, MT=151 was deleted
- For U-234 QM and QI for MF=3, MT=4 and 16 was corrected; for MF=3, MT=18, energy value 5.05+6 was corrected at 5.08+6
- For 94-Pu-238 and MF=1, MT=451 EMAX was corrected to 2.0+7 and NMOD for MF=3, MT=3 was set to 1
- For 94-Pu-238, 239, 241 and MF=5, MT=4, 16, 18 probability tables for threshold energies were corrected
- For 92-U-236, MF=5, MT=4, 16 probability tables for threshold energies were corrected, for MF=5, MT=16 first incident energy was corrected from 1.188400+6 to 1.188400+7.
- Assignment of MT numbers was changed by R. MacFarlane to provide the right processing of the files by NJOY
- Sections with average number of prompt fission neutrons were added by R. MacFarlane to provide the data completeness in the neutron transport calculations.

- Nu-prompt was given as for neutron induced fission in the same compound nucleus, taking into account neutron binding energy.
- For U-235 constant U was corrected at U=-30.

In some cases fission neutron yields data, which are required for secondary particle production and transport calculations are not included in the file.

Errors:

- No errors detected after corrections.

CNDC files

Corrections:

- For all files, MF=1, MT=451 EMAX was corrected at 3.0+7.

Errors:

- MF=4, MT=50, 51, ... , 90 are not allowed for non-neutron induced reactions. MF=6 should be used.

JENDL files

Corrections:

- For 7-N-14, MF=1, MT=451 NSUB was corrected to 0 and EMAX was corrected to 1.5+8
- For 1-H-2, 26-Fe-54, 56, 28-Ni-58, 29-Cu-65, 30-Zn-64, 74-W-182, 186 and MF=1, MT=451 EMAX was corrected to 1.4+8
- For 73-Ta-181 AWR was corrected to 1.79394+2 and in MF=1, MT=451 EMAX was corrected to 1.6+8
- For 29-Cu-65, MF=3, MT=3, 5 AWR was set to 6.437+01
- For 26-Fe-54, MF=3, MT=3, 5 and MF=33, MF=3 AWR was set to 5.34762+01; MF=3, MT=201 values for Eg between 2.94+7 and 3.08+7 were corrected (negative values were given in the original file); MF=6, MT=201, E1 was set to threshold value; MF=33, MT=3, E1 was set to threshold value
- For 26-Fe-56, MF=3, MT=3, 5 and MF=33, MF=3 AWR was set to 5.54544+01
- For 28-Ni-58, MF=3, MT=3, 5 AWR was set to 5.74376+01
- For 29-Cu-65, MF=3, MT=3, 5 AWR was set to 6.437+01
- For 30-Zn-64, MF=3, MT=3, 5 and MF=33, MF=3 AWR was set to 6.3380+01; MF=6, MT=201, 203 probability tables for E=1.196+7 were corrected; MF=33, MT=3 E=1.4+6 was corrected to E=1.4+7
- For 73-Ta-181, MF=1, MT=451 ZAI was set to 7.4182+4 and AWR was set to 1.8039+2; MF=3, MT=3, energy point between 6.5+7 and 7.0+7 was corrected to 6.8+7 and value to 1.55-2
- For 74-W-182, MF=1, MT=451 ZAI was set to 7.4182+4, AWR was set to 1.8039+2, AWI was set to 0; MF=3, MT=201,203, 204, 205, 206, QM and QI were corrected; MF=6, MT=5, E1 was set to 5.0+5 as in MF=3, MT=5; MF=6, MT=201, E1 was set to 8.06236+6, probability tables for E=8.06236+6 and 1.0+7 were corrected; MF=33, MT=6, table for variances was corrected
- For 74-W-186, MF=1, MT=451 AWI was set to 0.

Errors:

- For 26-Fe-54, 56, 28-Ni-56, 29-Cu-65, 30-Zn-64 and MF=6 MT=5 log-log interpolation scheme is used for points with zero cross sections
- For 26-Fe-54, 56, 29-Cu-65, 30-Zn-64, 74-W-182, 186, MF=6, sections MT=201, 203, 204, 205, 206, 207 do not span the same energy range as MF=3 (first incident energy should be the threshold energy); MF=33, MT=3 sub-section with LB=8 should be given, last variance value (for E>= EMAX) should be 0.