To the CSEWG Formats Committee

CSEWG Meeting

Brookhaven National Laboratory

November 2019

ENDF-6 Format Proposals

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10.1 General Description

The text in the last paragraph says, quote: "File 10 is allowed only for evaluations that represent the data for single isotopes."

This is reasonable when the product nucleus is uniquely defined by the reaction and the data are given for different final states of the product nucleus. However, MF=10/MT=5 can be used to define reaction products from reactions that are not explicitly represented by MT numbers and particularly for reaction products from natural elements. This is used extensively in the IRDFF-II Dosimetry library, where the monitor samples are usually natural elements, but the same residual that is measured can be produced by different reactions from different isotopes. For example, reactions on a natural nickel sample that contribute to ^{58}Co production are:

^{58}Ni(n,p)

^{60}Ni(n,nd)

^{60}Ni(n,2np)

^{60}Ni(n,t)

^{62}Ni(n,2nt)

^{62}Ni(n,4np)

^{62}Ni(n,3nd)

Above 20 MeV the ^{60}Ni(n,2np) reaction represents the dominant contribution to ^{58}Co production.

The proposal is to remove the last sentence in the first paragraph of Section 10.1 mentioned above, which administratively excludes the use of MF=10 for elemental data.

The proposal is necessary for dosimetry and activation libraries, especially at higher energies that are becoming increasingly important in fusion and accelerator applications, where the contributing reactions are many and they might not have the corresponding MT defined explicitly.

Appendix B

In the IRDFF Dosimetry Library "https://www-nds.iaea.org/IRDFF/" there are references to well-defined neutron fields that can be used for data validation. There is the need to store the neutron spectra shape, as well as the full covariance information. The operations that need to be performed on the spectra (e.g. group averaging, data display and comparison, etc) are very similar to those that are performed on the cross sections, so it is convenient that storage follows the established ENDF-6 format rules. Formally, normalized energy distributions in ENDF-6 format are stored as normalized distributions in MF=5 with normalization given in MF=3. For general spectra this is unnecessary since there is no incident-particle energy dependence and normalization is arbitrary. A more convenient way is to store the spectra in MF=3 with arbitrarily chosen MT=261, which is currently unassigned.

The proposal is to formalize and legalize the use of MT=261 to represent neutron fields in special purpose libraries like the IRDFF Dosimetry Library, for example.