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Memo CP-D/455

Date: 9 March 2006
To: Distribution
From: O. Schwerer
Subject: Dictionaries 33, 209, 227
Reference: Memo CP-E/088 of 20 February 2006

General remarks on the nuclides dictionary 227:

The change from the old dictionary 27 to the new one, which is derived from the Nuclear Wallet Cards, implies more than a format change. The old dictionary 27 was "hand-made" and contained only those nuclides which did actually occur in EXFOR or CINDA (there were nuclides which occurred only in theoretical CINDA entries but in no experiments). Its main purpose was the use in checking and related programs, and we always warned not to "misuse" it as a chart of nuclides, because it was not intended to be complete.

The new dictionary 227 is different in this respect. It contains all nuclides for which enough information is available to be included in the Wallet Cards (and this is sometimes very little), and therefore includes many nuclides which do not occur in EXFOR. The change to this type of dictionary was made to make our life easier in terms of updating it. There may be some consequential changes needed in our use of it, and by getting more experience in using it, some optimization of its usage and/or the checking program will be needed.

On Naohiko's remarks:

- 1) The general definition of "isomeric states" is the same in EXFOR and in the Wallet cards: half-life greater or equal 0.1 sec. (A few important cases with shorter half-lives are also listed in the Wallet cards if they decay by an "interesting" mode such as spontaneous fission.)
- 2) The flag -A points to nuclides which are marked in the Wallet Cards with a *question mark* (meaning that the nuclide as such, or its basic data such as half-life, is not yet fully established). This flag was not mentioned in the dictionary description because it was originally not "foreseen" by us but it was taken over from the Wallet Cards by the conversion program. If it does not disturb anybody's programs, I propose to keep it (it is useful information) and to update the description accordingly.

Missing codes in dictionaries 33 and 209:

The codes are present in the archive and "Daniel" backup dictionaries (which are used by our programs) but were not carried over to the TRANS dictionary because of an INTERNAL flag. I will correct the flag to TRANSMITTED in the next update so that all the codes will correctly be carried over to the TRANS dictionary.

"No ground state and 2 metastable states in wallet cards"

There are a number of cases where 2 isomeric states exist but it is not known which one is the ground state. In these cases, both are flagged in the Wallet Cards as -M, which is, in my opinion, the best possible solution. We had no real solution for this case in the old dictionary 27; in the cases which came to our knowledge and which were relevant to EXFOR, we put just a free text comment in dictionary 27 saying "*2 isomers exist, not known which one is ground state*" (see e.g. 45-RH-110). (Of course, these entries in old dictionary 27 are neither up-to-date nor complete; this is another reason for changing to new dictionary 227).

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