Nuclear Data Section
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Memo CP-D/358

Date: 10 March 2003
To: Distribution
From: O. Schwerer

Subject: **Differential number of (prompt) neutrons**
(Probability of the emission of "n" prompt neutrons in one fission event)

Reference: Subentry 41056.003 (TRANS 4127 and again PRELIM.4129)

On TRANS 4127, the quantity "Probability of the emission of "n" prompt neutrons in one fission event" was coded

(1) `(0,F+XN),PR,NU,,REL`

Except for the code `REL` in SF8, this is the coding given in LEXFOR (page N.1) for this quantity.

However, after a suggestion from V. McLane by e-mail, this subentry was retransmitted in PRELIM 4129, replacing the above coding by

(2) `(0,F),PR,DN,,REL`

I have the following notes on this:

- Coding (1) is still the correct one according to LEXFOR. No change has been proposed so far.
- Since this quantity is so closely related to NUbar, I find the current (old) solution not so bad.
- The code DN for SF6 was introduced for "cross section differential with number of outgoing neutrons" and is, so far, used only as SIG/DN. Reactions with SF6 = "DN" only are not yet defined.
- I appreciate however that, since we changed the units of NUbar from NO-DIM to PRT/FIS, a change is necessary.
- I propose therefore the following coding for the Probability of the emission of "n" prompt neutrons in one fission event:

(3) **`(…,F),PR,NU/DN)`**
without `REL` in SF8, with units `NO-DIM`.

This would need the following changes in dictionaries and LEXFOR:

Dictionary 32 (Modification):

DN differential with number of outgoing neutrons (to be combined with SIG or NU)

Dictionary 36 (Additions):

,NU/DN	Probability of the emission of "n" neutrons in one fission event
PR,NU/DN	Probability of the emission of "n" prompt neutrons in one fission event

LEXFOR:

Update page N.1 accordingly, i.e. under "Neutron yield", in paragraph REACTION coding, replace
(…….(N,F+XN),,NU) by
(…….(N,F),,NU/DN)

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