Memo CP-D/184

22 September 1988

To: Distribution

From: Otto Schwerer

Subject: TRANS M006

Please find enclosed our comments on TRANS M006.

General comments:

- We appreciate the big volume of the data in this TRANS. We also note that there are relatively few errors from the formal point of view. However, there are many cases where we do not agree with the usage of codes, mainly concerning REACTION and related coding in the DATA section. For some cases, new codes or new code combinations for dictionary 36 might be needed, but the information given in the Exfor entries is insufficient for us to propose the correct coding.

  Therefore, CDFE is asked to make the necessary corrections and to retransmit all corrected entries. (We did not flag particular subentries for retransmissions this time).

  See the detailed comments on the following pages.

Clearance: J.J. Schmidt

Distribution:

S. Pearlstein, NNDC
N. Tubbs, NEA-DB
V.N. Manokhin, CJD
F.E. Chukreev, CAJAD
A. Hashizume, RIKEN
V. Varlamov, CDFE
H. Tanaka, Study Group
Zhuang Youxiang, IAE-CP

NDS: M. de Moraes Cunha
D. Gandarias
V. Goulo
Tin Maung Kyi
M. Lammer
H.D. Lemmel
K. Okamoto
V. Osorio
J.J. Schmidt
O. Schwerer
M. Seits
Wang Dahai
3 spare copies

3067N

- We notice that, for the first time, some electron-induced data are included as well. Since this was agreed upon in principle at a previous NRDC meeting, we will add 'E' to dictionary 28 (incident particles) at the next dictionary update.

- We notice that apparently very often the abstract of the original paper is entered under COMMENT. When this information is relevant to the Exfor entry, it would be preferable to give it under the appropriate keywords METHOD, ANALYSIS, and others. More free text under those keywords where only codes were given would be desirable in general, in order to provide more details on the experiment.

- The data defined under REACTION must always be given under the heading DATA in the DATA section, but not under MISC. MISC may only be used for additional numerical information, to be given in addition to the DATA defined under REACTION. This concerns the following (sub-) entries (not repeated in the list of detailed comments):

  M0094, M0139, M0158, M0161, M0162, M0163,
  M0175.009-11, M0176.002-7, M0179, M0182.005, M0184,
  M0186.012-21, M0188, M0191, M0193, M0200.015.

- The data units SEE TEXT are allowed for MISC only but not for DATA. If for a certain data type the units needed do not exist in dictionary 25, their addition should be requested by CP memo. (For quantities existing in dictionary 36 the usual units normally do exist in dictionary 25).

- Multiple REACTIONs in one subentry must always have the same target.

Entry	Subent	Line(s)	Comment
M0094	2,3		REACTION ...,PAR,SIG,... is not consistent with the units MEV*MB/SR given in free text where it also says "integrated differential cross-section". An integrated differential cross-section would have the units MB and the REACTION...PAR,DA,,4PI,EXP (if it is considered the differential c.s. at a given angle times 4π) or ...,PAR, SIG,,,EXP (if it is considered isotropic or truly integrated over all angles; in this case ANG must not be given in COMMON or DATA). If, on the other hand, the units MEV*MB/SR should be correct, this looks like an angle-dependent cross-section integral (this is integrated over the incident particle energy as opposed to an "integrated cross-section"), which would be a new quantity for Exfor (i.e. a new combination of

Entry	Subent	Line(s)	Comment
			codes for dictionary 36), like ...,PAR,INT/DA,,,EXP.
M0117	2,3	3	REACTION SF5: delete PAR because no secondary energy is given.
	3	3	Add T to SF7 (this is necessary because there are 2 outgoing particles in SF3). Therefore REACTION = (3-LI-7(G,T+G)2-HE-4,SEQ,DA,T,,EXP).
M0125	2	3	Delete PAR because no secondary energy given.
	3-11		REACTION should probably be (40-ZR-90(G,P)39-Y-89,,DA/DE,,REL,EXP and units should be ARB-UNITS. (...,PAR,DA/DE is defined as partial double-diff. c.s. for specific level of residual nucleus. In this entry, however, E-MIN and E-MAX obviously refer to the outgoing protons and no levels of Y-89 are referred to).
M0139	2-6		REACTION ...,DA,,4PI,EXP is not consistent with units MB*MEV. (This is similar to the case in M0094). It could be a double-differential cross-section integrated over all angles (or at an angle times 4π), but the units would be MB/MEV and the REACTION ..., DA/DE,,4PI,EXP; or it is another case of angle dependent cross-section integral over the incident energy (like in M0094) but, here, times 4π, which could be coded with another new combination for dictionary 36: ..., PAR,INT/DA,,4PI,EXP. If the free text comment "integral cross section" is correct, the units must be MB; since E-EXC is given, PAR should be given in SF5, so that the REACTION would be ..., PAR,DA,,4PI,EXP. Again, the original reference is required to decide which coding is correct.
M0140	2	3	REACTION must be coded as 3-LI-6(G,X)0-NN-1,,SIG,,,EVAL. 'XN' in SF3 is allowed only if the number of outgoing neutrons is coded as a variable in the DATA section under the heading N-OUT.
	3 4	6) 7)	remove '(' in col.12
	5		1) REACTION must be coded as 3-LI-6(G,X)1-H-1,,SIG,,,EVAL (compare subentry 2).

Entry	Subent	Line(s)	Comment
			2) E-LVL should probably be deleted from COMMON section, because no residual nucleus is defined and PAR not coded in SF5.
	17	6	2 subfields of REL-REF repeated.
M0142	6,9,10	5	SF6 should be DA/DE.
M0143	1	3	" is invalid character in Exfor, use ' instead.
M0145	3-6 4-6		REACTION: SF6 should be DE instead of DA/DE. REACTION: delete PAR from SF5 (not applicable for this case).
M0148	2-6		If ELEMENT and MASS are given in the DATA section, isomeric states should be given under heading ISOMER rather than FLAG. (ISOMER blank - no isomer or sum of all isomers, 0. - ground state, 1.- first metastable state, 2. - second metastable state etc.) The ISOMER column should be placed after the MASS column.
M0149	2-4		Multiple REACTIONs given in one subentry must have the same target nucleus in SF1. Therefore each of the subentries 2,3 and 4 has to be split into 2 separate subentries.
M0149	2-5		ELEM/MASS should not be used if there is only 1 value for both given in the DATA section. In such a case the reaction product must be given in the usual way in REACTION SF4. E.g., subentry 5 should be 28-NI-64(G,X)11-NA-24,,TTY,,,EXP.
M0150	2-5		Each of these subentries contains REACTIONs for 7 different targets which is not legal. On the other hand, the data for the same target but different reaction product given in ELEM/MASS should be combined in 1 subentry. E.g., subentry 2 could look like REACTION (12-MG-25(G,X)ELEM/MASS,,TTY,,,EXP)

	DATA ELEMENT	MASS	DATA	DATA-ERR
(from old subentry 4)	3.	7.	0.51	0.07
(from old subentry 2)	11.	22.	9.3	0.9
(from old subentry 3)	11.	24.	2.87	0.2

Entry	Subent	Line(s)	Comment
M0151	2		DATA section: 1) FLAG 1. not used in table, 2) use isomer instead of FLAG 2,3.
M0152	3-13,15		FLAG missing in BIB section.
M0153	2-4		Split in separate subentries because of different targets.
	4	25	No value given for DATA-ERR 6.
M0155	2-5		REACTION SF5: PAR probably not correct because no secondary energy given.
M0156	2-6		REACTION: the coding (G,F),CHG,FY means "total element yield of fission products" and requires coding of ELEMENT in the DATA section. In this case, however, we believe that probably not fission product yields are meant but photofission yields (= fissions per photon) which in case of ratios like here is equivalent to the fission cross section ratio, to be coded ((92-U-235(G,F),,SIG,,,EXP)/ (92-U-238(G,F),,SIG,,,EXP))
M0158	2,3		See comment on M0094.
M0161	2-4		1) The comments on M0094 apply here, although SF6 = DA. 2) (G,P+G), (G,N+G) etc.: outgoing γs are always included, therefore use (G,P),(G,N) etc. (except if SF5 = SEQ)
M0162	2-4		1) See comment on M0094. 2) See comment 2) on M0161.
M0163			1) EN and ANG missing in all subentries: perhaps COMMON in subentry 1 lost? 2) See comment 1) on M0161.
M0164	2		REACTION must be ...(G,X)0-NN-1,,SIG,,,EXP.
M0165	2		Delete PAR from REACTION SF5.
	3-11		REACTION: 1) delete PAR from SF5, 2) add REL to SF8. Change data units to ARB-UNITS (see comment on M0125).
M0167	1	8,9	Report should be spelled KIYAI-
	8	14	Data line repeated.
	27	19	EN-MAX should be = 15.

Entry	Subent	Line(s)	Comment
M0167			We do not understand the relation between the REACTION given and the units given in free text. If the data are relative, the units must be ARB-UNITS. The comment "Total yield * 10**5 in N/G*MUAHR*SEC" for the REACTION ...,DL,NU,REL,EXP (subentry 2-7), however, suggests that it is not really proportional to the total yield, and the units are not really arbitrary but something else. Where do the micro-ampere-hours * seconds come from - perhaps from the Bremsstrahlung source? In this case the numbers are not pure delayed neutron yields but some other quantity which so far was not compiled in Exfor and, if it is important enough data to compile, would require a new code for SF5-SF8 (to be introduced in dictionary 36). Without knowing the original references we cannot decide this; could it be that these are a kind of raw data, with the main results being in subentry 37-41 (absolute yields in N/100 fissions) and 42-47 (delayed neutron cross sections in MB)? In all other subentries the units given in free text indicate that the data are probably not exactly corresponding to the reaction code.
	2-7		Total yield * 10^5 in N/G*MUAHR*SEC = ?
	8-12		Reduced yield * 10^5 in N/G*MUAHR = ?
	13-36		Yield * 10^5 in N/G*MUAHR*SEC = ?
	37-41		Absolute yield in N/100 fissions: the EXFOR convention is to give the data in neutrons per fission (i.e. divide numbers by 100) with units NO-DIM (see LEXFOR, Delayed Fission Neutrons).
	42-47		"cross section multiplied by 0.1" in MB. Why not just use MB? (If you want to keep the original numbers from publication, include the factor 0.1 in DATA table using E-format E-01).
	48-52		"reduced cross section" in MB*SEC = ?
M0168			EN missing for whole entry
	2		...,CUM,FY needs fission product(s) coded in SF4 or DATA section. This must be another quantity.
	3-19		1) REACTION should be ...,DE,FF,REL,EXP (relative energy spectrum of fission fragments). KE in SF6 would require data units MEV. 2) Heading of independent variable should be E rather than MISC.
M0169	2-7		REACTION SF6 should be DE

Entry	Subent	Line(s)	Comment
M0170	2-6		This seems to be a new quantity for Exfor which cannot be coded as a cumulative fission yield. FY in SF6 requires fission product(s) in SF4 or under ELEMENT/MASS; and ANG-MIN, ANG-MAX in COMMON or DATA requires DA or COR in SF6. More details needed to propose other coding.
M0171	2-6		Since the data depend on the angles coded in COMMON, REACTION should probably be ...,,DA/KE,FF,,EXP. (to be entered in dictionary 36).
M0172	2		Half-lives in different units should be given in separate columns (this is a case where repetition of a column heading is legal, see Manual page 5.4). Therefore, change heading FLAG to HL, units to D and move the appropriate values to this column.
M0174	2,3		EN missing.
M0175 M0176	9-11) 2-7)		This representation of angular distributions is, at present, not forseen in Exfor and cannot be coded with COS in SF8. If it is important, a new code would be needed.
M0178	3-6		ARB-UNITS in a subentry with only 1 data point make little sense because not even a relative shape of a curve is given, or a relation to another data point. Is there really no other meaning of the units? The numbers could make some sense if the units are the same in all subentries, so that one could compare the data e.g. of Th-232 with U-238. However, this is not possible either, because the relative d.n. yield for U-238 for EN-MAX = 15 MeV is 1.01 ARB-UNITS (subentry 2) and at the same time 3.1 ARB-UNITS (subentry 5).
	2		The error is 4 times bigger than the value - is this correct?
M0179	2		This representation of ang. distributions does not yet exist in Exfor and cannot be coded with COS in SF8. Since it seems to be a series in powers of $\sin^2$ for which the code SN2 in SF8 exists for angular correlations, perhaps the code ...,DA,FF,SN2/RS,EXP or similar should be introduced in dictionary 36 (for this the original reference has to be checked).