

**Illegal REACTION SF2=SF3**

(N. Otsuka, 2018-05-16, Memo CP-D/960)

It is not allowed to have the same code in REACTION SF2 and SF3 in general though it was legal in the past (c.f. LEXFOR “Scattering” in IAEA-NDS-208 Rev. Aug. 2002). For example

(6-C-12(P,P)6-C-12,PAR,DA)

is illegal, and should be changed to

(6-C-12(P,EL)6-C-12,,DA),

(6-C-12(P,INL)6-C-12,PAR,DA),

etc. I assessed about 45 such REACTION codes in the EXFOR Master File as summarized in the list appended to this memo.

Addition of the following italicized paragraph to the EXFOR Formats Manual Chapter 6 is proposed:

**Reaction field**

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**SF3. Process.** In general, this field contains a process code or the particle(s) produced in the reaction with the exception of the reaction product (which is given in SF4), or a combination of the two (see Coding rules, following).

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*e) The particle or nuclide code in SF2 may not be repeated in this subfield. For scattering, a process code such as EL, INL, SCT. THS must be used.*

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<b>Subentry</b>	<b>REACTION</b>	<b>Suggested corrections</b>
A0511.002	(6-C-12(P,P)6-C-12,,DA,P)	SF3: P -> EL. SF7: Delete P. ANG -> MISC. DATA -> DATA-CM.
A0511.003.1	(6-C-12(P,P)6-C-12,,POL/DA,,ANA)	SF3: P -> EL?
A0511.003.2	(6-C-12(P,P)6-C-12,,DA)	SF3: P -> EL?
A1379.010	(3-LI-6(D,D)3-LI-6,PAR,DA)	SF3: D-> INL
C0159.002	(5-B-11(A,A)5-B-11,,DA,,RTH)	Delete. Duplication of C0887.002.
C0159.003	(5-B-11(A,A)5-B-11,,DA,,REL)	Delete. Duplication of C0887.003.
C0201.004	(3-LI-6(D,D)3-LI-6,PAR,DA)	SF3: D-> EL. SF5: Delete PAR. Delete E-LVL=0.
C0201.009	(3-LI-7(D,D)3-LI-7,PAR,DA)	SF3: D-> EL. SF5: Delete PAR. Delete E-LVL=0.
C0201.010	(3-LI-7(D,D)3-LI-7,PAR,DA)	SF3: D-> INL.
C0201.017	(6-C-12(D,D)6-C-12,PAR,DA)	SF3: D-> EL. SF5: Delete PAR. Delete E-LVL=0.
C0201.020	(8-O-16(D,D)8-O-16,PAR,DA)	SF3: D-> EL. SF5: Delete PAR. Delete E-LVL=0.
C0295.004.1	(1-H-3(D,D),,L)	?
C0295.004.2	(1-H-3(D,D),,WID/RED,,RMT/AMP)	?
C0295.005.1	(1-H-3(D,D),,WID)	?
C0295.006.1	(1-H-3(D,D),,WID)	?
C0503.002	(6-C-12(3-LI-6,3-LI-6)6-C-12,,DA)	SF3: 3-LI-6 -> EL
C0503.003	(14-SI-28(3-LI-6,3-LI-6)14-SI-28,,DA)	SF3: 3-LI-6 -> EL
C0504.002	(6-C-12(3-LI-6,3-LI-6)6-C-12,,DA)	SF2: 3-LI-6 -> 3-LI-7. SF3: 3-LI-6 -> EL
C0504.003	(14-SI-28(3-LI-6,3-LI-6)14-SI-28,,DA)	SF2: 3-LI-6 -> 3-LI-7. SF3: 3-LI-6 -> EL
C0753.002	(4-BE-9(A,A)4-BE-9,,DA,,RTH)	SF3: A -> EL
E1154.005	(28-NI-62(14-SI-28,14-SI-28)28-NI-62,,DA)	SF3: 14-SI-28 -> INL. SF5: Add PAR. Add E-LVL=1.78 MeV.
E1154.006		E-LVL -> E-LVL1 and add E-LVL2=1.78 MeV.
E1154.007	(28-NI-62(14-SI-28,14-SI-28)28-NI-62,PAR,DA)	SF3: 14-SI-28 -> INL
E1154.011	(28-NI-62(14-SI-28,14-SI-28)28-NI-62,PAR,SIG)	SF3: 14-SI-28 -> INL
E1294.012	(28-NI-64(14-SI-28,14-SI-28)28-NI-64,,DA)	SF3: 14-SI-28 -> INL. SF5: Add PAR. Add Q-VAL=-1.34 MeV and -1.78 MeV.
E1294.013	(28-NI-58(14-SI-28,14-SI-28)28-NI-58,,DA)	SF3: 14-SI-28 -> INL. SF5: Add PAR. Add Q-VAL=-?.?? MeV and -1.78 MeV.

E1294.014	(28-NI-64(14-SI-28,14-SI-28)28-NI-64,,DA)	SF3: 14-SI-28 -> INL. SF5: Add PAR. Add Q-VAL=-1.34 MeV and -1.78 MeV.
E1294.015	(28-NI-58(14-SI-28,14-SI-28)28-NI-58,,DA)	SF3: 14-SI-28 -> INL. SF5: Add PAR. Add Q-VAL=-??.? MeV and -1.78 MeV.
E1294.016	(28-NI-64(14-SI-28,14-SI-28)28-NI-64,,DA)	SF3: 14-SI-28 -> INL. SF5: Add PAR. Add Q-VAL=-1.34 MeV and -1.78 MeV.
E1669.002	(82-PB-208(4-BE-11,4-BE-11)82-PB-208,PAR,DA)	Delete. Duplication of E1806.003.
M0673.002	(1-H-1(G,G)1-H-1,,DA)	SF3: G -> EL (Compton scattering)
M0673.003	(1-H-1(G,G)1-H-1,,POL/DA,,ASY/PP)	SF3: G -> EL (Compton scattering)
O0047.007	(28-NI-58(P,P)28-NI-58,PAR,SIG,G)	SF3: P -> INL.
O0597.011	((29-CU-0(PIP,PIN),,DA)+ (29-CU-0(PIP,PIP),,DA))	Use ((29-CU-0(PIP,X)1-PN-0,,DA)+(29-CU-0(PIP,X)1-PP-0,,DA)).
O0597.013	((6-C-0(PIP,PIN),,DA)+ (6-C-0(PIP,PIP),,DA))	Use ((6-C-0(PIP,X)1-PN-0,,DA)+(6-C-0(PIP,X)1-PP-0,,DA)).
O0597.015	((82-PB-0(PIP,PIN),,DA)+ (82-PB-0(PIP,PIP),,DA))	Use ((82-PB-0(PIP,X)1-PN-0,,DA)+(82-PB-0(PIP,X)1-PP-0,,DA)).
R0017.003	(5-B-10(P,P)5-B-10,PAR/IND,SIG,,REL)	Use (5-B-10(P,INL)5-B-10,PAR,SIG,G,REL).
R0019.002	(6-C-12(7-N-14,7-N-14)6-C-12,PAR/IND,DA)	SF3: 7-N-14 -> EL. SF5: Delete PAR/IND.
R0019.003	(8-O-16(7-N-14,7-N-14)8-O-16,PAR/IND,DA)	SF3: 7-N-14 -> EL. SF5: Delete PAR/IND.
R0019.004	(8-O-16(5-B-10,5-B-10)8-O-16,PAR/IND,DA)	SF3: 5-B-10 -> EL. SF5: Delete PAR/IND.
R0019.005	(7-N-14(5-B-10,5-B-10)7-N-14,PAR/IND,DA)	SF3: 5-B-10 -> EL. SF5: Delete PAR/IND.
R0019.006	(6-C-12(5-B-10,5-B-10)6-C-12,PAR/IND,DA)	SF3: 5-B-10 -> EL. SF5: Delete PAR/IND.
T0046.005	(2-HE-3(D,D)2-HE-3,,SIG)	SF3: D -> EL
T0046.007	(2-HE-3(D,D)2-HE-3,,POL/DA,,VAP)	SF3: D -> EL
T0233.005.2	(8-O-16(A,A),,WID)	?