Short Nuclide Code for SF7
Memo CP-D/648 (N. Otsuka, V. McLane, O. Schwerer, S. Dunaeva, 2010-06-10)

We would like to revisit the problem of long reaction strings. According to Conclusion 20 of the NRDC 2002 meeting, nucleus with $Z>4$ has been coded in the Z-S-A formalism

Example **(D0271.002): dσ/dΩ(p)/dE_x(^{40}Ca)**
```
20-CA-40(P,P+X)2-HE-4,,DA/DE,P/20-CA-40
```

At the 2004 NRDC meeting a decision was made to allow continuation records to solve this problem (Conclusion 26). While this will probably still be necessary, we believe there is an additional solution that would take care of many of the current strings that are longer than 55 characters.

For helium-6, we have a short version of its nuclide code `HE6` exceptionally. We propose to extend this coding way for all nuclide coded in SF7 to simplify REACTION codes as it was proposed in WP2004-19. The following new particle codes are then necessary for existing entries

Dictionary 33 (Particles)
BE10	Be-10
C14	C-14
CA40	Ca-40
LI6	Li-6

Example **(D0271.002): dσ/dΩ(p)/dE_x(^{40}Ca)**
```
20-CA-40(P,P+X)2-HE-4,,DA/DE,P/CA40
```

Note that these codes are proposed only for SF7. Also `RSD` will be used if particle considered is equal to SF4.

Example **(D5051.003): dσ/dΩ(α)/dΩ(^{6}Li)/dE(α)**
```
3-LI-7(A,N+A)3-LI-6,,DA/DA/DE,A/3-LI-6/A
```
must be
```
3-LI-7(A,N+A)3-LI-6,,DA/DA/DE,A/RSD/A
```
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The following update of the EXFOR Formats Manual is proposed:

SF7 Particle Considered. Provides particle or nuclide code(s) indicating to which of several outgoing particles or nuclides the quantity refers.[1] When more than one particle/nuclide is entered, *e.g.*, for a quantity describing the correlation between outgoing particles, all codes are entered, separated by a slash. For the case where a

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[1] Note that the particle considered is not necessarily identical to the particle detected, *e.g.*, the angular distribution of an outgoing particle that has been deduced from a recoil particle detected.

variable is given for a correlated pair, *e.g.*, the center-of-mass energy of two or more emitted particles, the codes are separated by a plus sign (+). Contains either a code from Dictionary 33 with an "allowed SF7 flag" (7) (see **LEXFOR, Outgoing Particles**). The code RSD is used in SF7 when the reaction product (SF4) is the particle considered.

Note: For particles heavier than α, a code in the form *Z-S-A-X* may exist in older entries.

Examples of SF7 entry:

`(….(…,P)4-BE-9,,DA,RSD)` angular distribution on ^{9}Be product.

`(….(…,N+P)….,DA/DA/DE,N/P/N+P)` triple differential cross section as a function of the angle of the emitted neutron and proton and the center-of-mass energy of the emitted neutron-proton pair.

The particle considered should be omitted if there is no ambiguity. For integral data this subfield is in most cases not used.