

LEXFOR “Scattering”

(N. Otsuka, 2022-08-06, Memo 4C-3/0421, A15)

I confirm the new coding rule concluded in the NRDC 2022 meeting works well for implementation of the corrections recommended in Memo 4C-3/0420, and propose addition of the following part in LEXFOR “Scattering”:

Partial Scattering

The sum of elastic scattering and partial inelastic scattering.

REACTION Coding: SCT in SF3 and PAR in SF5.

Example: (...(N,SCT)...,PAR,SIG)

Partial scattering cross section is typically obtained when the inelastic scattering leaving the target nucleus in low-lying excitation levels cannot be separated from the elastic scattering due to insufficient resolution.

1. When relevant level energies are given by the author:

These level energies (including 0 for elastic scattering) are coded under E-LVL.

2. When relevant level energies are not given but an approximate value of the maximum excitation energy (e.g., neutron energy resolution in FWHM) is given by the author:

The approximate value is coded under E-EXC-MX-A. The value must be explained under EN-SEC.

Example:

```
EN-SEC (E-EXC-MX-A,79-TA-181) Energy resolution of NE218
scintillator (~1.8 MeV)
```

When the author provides a dataset for $Q \sim 0$ component without secondary energy information, but the compiler believes the inelastic scattering contribution is not fully separated, the situation is indicated by EL in SF3 and EXL in SF5. Secondary energy inferred by other than the author is not coded but its estimation is given in free text.

Example:

```
REACTION (79-TA-181 (N,EL) 79-TA-181,EXL,DA)
CRITIQUE S.Simakov: Inelastic scattering below Ex~1.8 MeV (=energy
resolution of 13% at 14.1 MeV) may contribute.
REL-REF (S,S.Simakov+,INDC (NDS)-0857,91,2022)
Comment on inelastic scattering contribution.
```

We concluded in the NRDC 2022 meeting to use the heading E-EXC-MAXA for the approximate value of the maximum excitation energy. However, Dictionary 24 has abbreviated MAX as MX. To maintain consistency in the dictionary, I propose the following changes in Dictionary 24.

Dictionary 24 (Data headings)

E-EXC-MAXA (*Delete*)

E-EXC-MX-A Approximate upper limit of excitation energy range

A new modifier EXL (Excitation to low-lying levels) was added in Dictionary 9126. As WP2022-29 proposes such an indication by a new branch code rather than a new modifier and it looks more reasonable considering presence of a similar modifier EM (exclusion of elastic scattering). I propose to treat EXL as a branch code.

Dictionary 31 (Branches)

EXL (Excitation to low-lying levels)

Dictionary 34 (Modifiers)

EXL (Delete)