Proposed dictionary 30 code TCC (Total Charge Changing)

Comments on MEMO CP-A/144

V. McLane and O. Schwerer

Total Charge-Changing Cross Section: After looking at the papers given as examples in Memo CP-A/144, we think a clearer definition would be as follows.

Definition: The cross section for emission of a product whose charge differs from the incident projectile charge.

> If Z_0 = incident projectile charge,
> then σ_{TCC} = cross section for production of all particles such that $Z_1 \neq Z_0$

Sum Rule: $\sigma_{TCC} = \sigma_{tot} - \sigma_{Z0=Z1}$; where Z_0 is the projectile charge and Z_1 is the charge of the product measured.

Coding example:
        REACTION   (26-FE-56(N,TCC),,SIG)

The **Partial Charge-Changing Cross Section**, which is given for particles with a given ΔZ (e.g., $\Delta Z = -1$) can be coded as:

REACTION   (26-FE-56(N,X)ELEM,,SIG); with ELEM given in COMMON or DATA

Attached for reference: CP-A/144, CP-D/364

To: **Distribution**
From: **F.E. Chukreev, S.Babykina**
Subject**: TCC code plus LEXFOR page**
        (Reply to Memo CP-D/364)

We propose to input in Dictionary 30 new code-

TCC   **(total charge-changing cross sections)**

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LEXFOR

Total Charge-Changing Cross Section

Definition: the sum of all energetically possible nonelastic interactions minus the

neutron removal cross section.

Reaction Coding: TCC in SF3

Examples   (Target(28-Ni-52,TCC),,SIG)

(Target(6-C-12,TCC),,SIG)

Sum-rules: TCC= sigma (total)-sigma(el)-sigma(nr),

Where-sigma(total)=elastic plus nonelastic cross section

Sigma (nr)= only neutron removal cross section

Units: a code from Dictionary 25 - MB, etc.

References

1. B.Blank et.al. , Z.PHYS.A, 352, 69, 1995
2. A.N.Golovchenko et.al, Phys.Rev. C, 66, 014609, 2002

Memo CP-D/364

Date: 28 May 2003

To: Distribution

From: O. Schwerer

Subject: **Proposed dictionary 30 code TCC**

Reference: **Memos CP-A/139, CP-A/123**

The dictionary 30 (Process) code **TCC - Total charge changing**
was proposed in memo CP-A/123 in April 2002. Decision was postponed at the 2002 Paris NRDC meeting for the working group on high energy data in EXFOR to look into the matter.

While several memos relevant to high energy data were exchanged (all on elementary particle coding), no new information concerning total charge changing was distributed. However, the proposal was renewed in memo CP-A/139.

Adding a new code to the "Process" dictionary (REACTION SF3) is not trivial - these are codes like TOT (total), F (fission), EL (elastic) etc. which are all self-explanatory. Therefore we need more information.

- What is the definition of the Total charge changing cross section? (Lexfor entry)

- A coding example is needed. Is there a reaction product to be coded, either obligatory or optional? Any independent variables besides EN?

- In memo CP-A/123, the article ZP/A,352,69,1995 is mentioned as example. How would this be coded in EXFOR? (E.g., Tables 1 and 2)

- This article mentions a second article by the same authors measuring "partial charge changing cross sections". How will this be coded?

- Is the abbreviation TCC known well enough to be understood by the users? The present SF3 codes do not need any explanation or looking up the dictionary.