

15 November 1989

To: Distribution

From:  
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Subject: Quantity "Nuclide Production"

The quantity code NX for "Nuclide Production" has been adopted earlier. A detailed proposal is available, see Memo 4C-1/199 of 88/10/27.

When implementing this code, we found some details missing.

1. Numeric code for sorting

It had been proposed to sort this code after the charged-particle production cross-sections, i.e. after AEM. Unfortunately, this is not possible, because there is no sorting value free.

We therefore suggest to give it the numerical value 44 which will sort it not at the end but in front of the charged particle production quantities, between NEM and NP.

2. Expansion

The proposed expansion (n,x) is not sufficiently meaningful. We suggest the expansion "Nucl Product" for the book, and "Nuclide production" in other cases. This term is more correct than "Isotope production", as the term "isotope" in its strict definition refers to isotopes of the same element.



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3. Manual entry

Whereas above-mentioned memo 4C-1/199 gives a clear example for the use of this quantity, the proposed Manual entry looks too short. A suggestion for a more detailed Manual entry is attached.

On page II.2.1. giving an overview of the quantities, "NX 44 Nuclide production" is to be entered under the heading "Aggregate cross-sections".

The choice of the quantity code NX was a bit unfortunate, as in the Goldstein notation used in the CINDA book (Appendix table 2) and in the Manual the notation σ_{nX} has been used for "Nonelastic". Since this established notation should not be changed, we propose to use for the new quantity NX = Nucl Product the cross-section notation σ_{nNuc} .

Proposed Manual entry for the quantity NX = "Nuclide Production"

Reaction	Code	Expansion	Definition and use
$\sigma_{nNuc}(E)$	NX	Nucl Product	<p><u>Definition:</u> This quantity refers to the sum of processes occurring in a given target from which a given nuclide is produced, if these processes are not specified individually. The product nuclide must be given in the "Comments" field, following the author name.</p> <p><u>Use:</u> For sum cross-sections of reactions in a given target leading to the same product nucleus.</p> <p>At higher energies the target can be a natural element or an isotope; example: Z-S-A ((n,α)+(n,2d)+(n,2n+2p)+...)Z'-S'-A'.</p> <p>At lower energies the target must be a natural element; example: the target has isotopes Z-A and Z-(A+2); the reactions Z-A (n,γ) and Z-(A+2) (n,2n) both lead to the product nuclide Z-(A+1).</p> <p>Both cases: If the partial cross-sections leading to the product nuclide are not given, the sum cross section (n,x) is coded as "NX" with the product nuclide specified in the "Comments" field.</p>
$\sigma_{nNuc}(\theta)$			
$\sigma_{nNuc}(E;E',\theta)$			
etc.			