

**Units for particle and product yields
(CP-C/294, 286, 284, several e-mails)**

After many iterations, a consensus was reached with memo CP-C/294 and the new units were introduced in dictionary 25. Two items remain to be clarified:

- Definition of product vs. particle (CP-C/294, e-mail by Chukreev)
- Units PRD/FIS: were used on TRANS T009 (entry T0160) for nu-bar though not included in final proposal. At NDS replaced by PRT/FIS.

Do we need PRD/FIS for other cases?

**NATIONAL NUCLEAR DATA CENTER
Bldg. 197D
Brookhaven National Laboratory
P. O. Box 5000
Upton, NY 11973-5000 U.S.A.**

(Internet) "NNDC@BNL.GOV"

Telephone: (516)344-2902
FAX: (516)344-2806

Memo CP-C/294

DATE: (June 7, 2001) *Actually: October 23, 2001*
TO: Distribution
FROM: V. McLane
SUBJECT: Unit updates consensus (re: Memos CP-C/284, CP-C/286)

To summarize the remarks made to the proposal of Memo CP-C/286:

- Otto Schwerer prefers a combination of solutions 1 and 2, i.e., replacing specific reactions except for fission, but using only PRT instead of PRT and PRD. However, he can live with either solution.
- Felix Chukreev prefers using PRT and PRD, but also can live with either version.
Comment by VM: Regarding the comment on using PART-DET, the particle detected is, in general, defined by the reaction; PART-DET is only obligatory where this is not the case. PART-DET *is not tied to units*.
- Staca Maev is happy with either version.

I believe it is less confusing if we differentiate between particles and products, that is, SF3 and SF4. Therefore, so that we can begin using the codes immediately, I propose we go with the following modified version, with PRT used for all particles and PRD used for all products. **We should discuss a more exact definition of product or particle at the NRDC meeting in May.**

Attached is a listing of the codes to be used.

If there are no comments by in one month, I will assume this is agreed.

Using both PRD and PRT, and replacing specific reactions except fission, we have the following

codes. (I will add a discussion to LEXFOR for use in future additions).

PRT used for outgoing particle (in general reaction SF3, but may be defined in SF7, or in SF4 if SF3 is X).

PRD used for reaction product (in general, reaction SF4)

INC used for incident projectile (in general, reaction SF2)

REAC used for reaction with FIS used for fission (in general, reaction SF2-3)

PC for percent (also per 100 incident)

<u>Code</u>		<u>Replaces</u>
MB/PRT	Millibarns/outgoing particle	new
P/IN/MEVSR	Particles/inc.projectile/MeV/steradian	N/PT/MEVSR
PC/FIS	Particles/100 fissions	as is
PC/FIS/MEV	Particles/100 fissions/MeV	PC/FIS/MEV
PC/INC	Particles/100 incident projectile	GAM/100N
PC/REAC	Particles/100 reactions	all other reactions besides fission
PRD/REAC	Products/reaction	new
PRD/INC	Products/inc.projectile	NUC/PART
PRD/MUAHR	Products/microAmpere/hour	PART/MUAHR
PRT/FIS	Particles/fission	PART/FIS
PRT/REAC	Particles/reaction	new
PRT/IN/MEV	Particles/inc.projectile/MeV	N/PART/MEV
PRT/INC	Particles/inc.projectile	GAM/PART and N/PART
PRT/INC/SR	Particles/inc.projectile/steradian	G/PT/SR

Subject: Comments on preliminary TRANS T009
From: "Otto Schwerer, IAEA Nuclear Data Section"
<SCHWERER%IAEAND@NDSALPHA.IAEA.ORG>
Date: **Tue, 09 Oct 2001 11:15:15 +0100 (CET)**

Dear all,

please find below my comments on preliminary TRANS T009.

T0130.013,014,015: Redundant closing parenthesis in REACTON code

T0160.004,005: New units PRD/FIS: were proposed in memo CP-C/284 which however is superseded by memo CP-C/286, where this code was no longer mentioned.

However, in proposal (1) of CP-C/286, there is a code PRD/REAC with the expansion "Products/fission", which probably should read PRD/FIS.

In this context, I need clarification, or a consensus, which of the 2 alternative

proposals of CP-C/286 is considered approved, for the next dictionary update which I want to do very soon.

I asked for this clarification in an e-mail to all of 12 July. My personal preference, as mentioned there, would be proposal (2). This would mean, among other things, changing PRD/FIS to PRT/FIS.

Best regards,

Otto

Subject: PRT and PRD codes
From: NUCLIDE <feliks@polyn.kiae.su>
Date: **Thu, 12 Jul 2001 15:19:36 +0400**

To all on CP-C/286 and O.Schwerer remark.

Both versions are possible. But if we save PRT only, then we must accept additional rule: "PART-DET must be included obligatory"

Example: 11-NA-23(A,2P)11-NA-25,,PY

Both Na-25 and proton are reaction products, of course, but for majority of users Na-25 is product of the reaction only. If we will use PRD/INC, then users will understand, that yield of Na-25 has been measured. If we will use PRT/INC only, we must include PART-DET too, because yield of protons = 2* yield of Na-25.

May be PRT must be used for elementary particles only (p, gamma, neutron, meson, electrons etc). Then new rule is needed: "PRT can be used for the particles with barion charge less or equal 1"

Best regards.
F.E.Chukreev,
Tel: (095)-1961612
(095)-1969968

CAJAD, Kurchatov's Institute, Moscow,123182,
Russian Federation.
E-mail feliks@polyn.kiae.su
Fax: (095) 8825804

Subject: Re: Unit code updates (Memo CP/C/286)
From: Otto Schwerer <schwerer@iaeaand.IAEA.ORG>
Date: Thu, 12 Jul 2001 11:19:09 +0200

To all on CP-C/286:

1) CP-C/286 contains actually 2 alternative proposals. Which one are we about to agree to?

I personally prefer version (2) (using only PRT but not both PRD and PRT) because a) as already mentioned in the memo, to have both PRD and PRT might be confusing for both users and compilers, and b) I prefer keeping the widely used unit PC/FIS (normally called "percent per fission") rather than replacing it by PC/REAC. But if everybody else prefers option (1) I can live with it.

2) In addition to the units proposed in WP2001-14, we agreed also to introduce MB/PRD (millibarns per product particle), see Conclusion C25. Please include it in the list as either MB/PRD or MB/PRT depending on the option selected.

3) In memo CP-C/286, **PRD/REAC is expanded as "Products/fission". This should be changed to "Products/reaction".**

Best regards,

Otto

Victoria McLane wrote:

>
> To all:
>
> I have heard back from only 2 centers both of whom agree with
> the proposal of Memo CP-C/286 for updating the unit codes.
>
> I therefore propose that we adopt the new codes as given in
> Memo CP-C/286 which are update of the agreement reached at the
> May NRDC meeting (Conclusion C25).
>
> If anyone disagrees, please "speak now or forever hold your
> peace".
>
> Vicki
>
> Victoria McLane
> National Nuclear Data Center
> Brookhaven National Laboratory
> Upton, NY 11973-5000
> Phone: 631-344-5205

> Fax: 631-344-2806
> Email: vml@bnl.gov

**NATIONAL NUCLEAR DATA CENTER
Bldg. 197D
Brookhaven National Laboratory
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Memo CP-C/286

DATE: June 7, 2001 (*distributed June 28, 2001*)
TO: Distribution
FROM: V. McLane
SUBJECT: Unit updates (continuing)

I have been looking through the gamma spectra data. There are spectra presented in units of gammas/100 captures. We will need new units for this. A possible code is PC/REAC, which could replace PC/FIS.

Looking at the units proposed in Memo CP-C/284, I realize that there is also one inconsistency with the codes proposed, that is, the use of PRT/100INC. This code should probably be changed to PC/INC.

A revised table of proposed codes follows.

Please send comments about the proposed units so we can settle the question soon.

Distribution:

M. Chiba, Sapporo
F. E. Chukreev, CAJaD
S. Dunaeva, Sarov
O. Gritzay, KINR
K. Kato, JCPDG
M. Kellett, NEADB
V. N. Manokhin, CJD

S. Maev, CJD
O. Schwerer, NDS
S. Takács, ATOMKI
F. T. Tárkányi, ATOMKI
V. Varlamov, CDFE
Zhuang Youxiang, CNDC
NNDC File

(1) Using both PRD and PRT, and replacing specific reactions, we would have the following codes.

<u>Code</u>		<u>Replaces</u>
P/IN/MEVSR	Particles/inc.projectile/MeV/steradian	N/PT/MEVSR
PC/INC	Particles/100 incident projectiles	GAM/100N
PC/REAC	Particles/100 reactions	PC/FIS
PC/REAC/MEV	Particles/100 reactions/MeV	PC/FIS/MEV
PRD/REAC	Products/fission	PART/FIS
PRD/INC	Products/inc.projectile	NUC/PART0
PRD/MUAHR	Products/microAmpere/hour	PART/MUAHR
PRT/REAC	Particles/reaction	PART/FIS
PRT/IN/MEV	Particles/inc.projectile/MeV	N/PART/MEV
PRT/INC	Particles/inc.projectile	GAM/PART and N/PART
PRT/INC/SR	Particles/inc.projectile/steradian	G/PT/SR

(2) Using only PRT, and leaving specific reactions, we would have the following codes.

<u>Code</u>		<u>Replaces</u>
P/IN/MEVSR	Particles/inc.projectile/MeV/steradian	N/PT/MEVSR
PC/CPT	Particles/100 captures	new
PC/FIS	Particles/100 fissions	same
PC/FIS/MEV	Particles/100 fissions/MeV	same
PC/INC	Particles/100 incident projectiles	GAM/100N
PRT/FIS	Particles/fission	PART/FIS
PRT/IN/MEV	Particles/inc.projectile/MeV	N/PART/MEV
PRT/INC	Particles/inc.projectile	GAM/PART, N/PART, NUC/PART
PRT/INC/SR	Particles/inc.projectile./steradian	G/PT/SR
PRT/MUAHR	Particles/microAmpere/hour	PART/MUAHR

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FAX: (516)344-2806

Memo CP-C/284

DATE: June 7, 2001
TO: Distribution
FROM: V. McLane
SUBJECT: Unit updates

I have been looking at using the NEW standard codes for the incident and outgoing particles in unit codes. I would like to suggest a change in the use of PRD for the outgoing particle. The main reason for this is that in coding, for example, the number of neutrons/fission, using the code PRD/FIS can be confusing to the user; likewise gammas/fission.

I suggest either (1) we use PRD and PRT for products and particles, or (2) use PRT for both. The codes using options (1) and (2) follow. Two would be the simplest. One might be the least confusing in the case of yield data.

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M. Chiba, Sapporo
F. E. Chukreev, CAJaD
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Zhuang Youxiang, CNDC
NNDC File

(1) Using both PRD and PRT we would have the following codes.

<u>Code</u>		<u>Replaces</u>
P/IN/MEVSR	Particles/inc.projectile/MeV/steradian	N/PT/MEVSR
PRD/FIS	Products/fission	PART/FIS
PRD/INC	Products/inc.projectile	NUC/PART
PRD/MUAHR	Products/microAmpere/hour	PART/MUAHR
PRT/FIS	Particles/fission	(also PART/FIS)
PRT/IN/MEV	Particles/inc.projectile/MeV	N/PART/MEV
PRT/INC	Particles/inc.projectile	GAM/PART and N/PART
PRT/INC/SR	Particles/inc.projectile/steradian	G/PT/SR
PRT/100INC	Particles/100 incident projectiles	GAM/100N

(2) Using only PRT we would have the following codes.

<u>Code</u>		<u>Replaces</u>
P/IN/MEVSR	Particles/inc.projectile/MeV/steradian	N/PT/MEVSR
PRT/FIS	Particles/fission	PART/FIS
PRT/IN/MEV	Particles/inc.projectile/MeV	N/PART/MEV
PRT/INC	Particles/inc.projectile	GAM/PART, N/PART, NUC/PART
PRT/INC/SR	Particles/inc.projectile.steradian	G/PT/SR
PRT/100INC	Particles/100 incident projectiles	GAM/100N
PRT/MUAHR	Particles/microAmpere/hour	PART/MUAHR