Nuclear Data Section
International Atomic Energy Agency
P.O.Box 100, A-1400 Vienna, Austria

Memo CP-D/589

Date: 30 September 2009
To: Distribution
From: N. Otsuka, O. Schwerer, S. Singh

Subject: **Fission fragment production cross section and fission yield**
Reference: Memo CP-D/483

Fission fragment production cross section $\sigma(Z,A)$ can be related to fission yield FY(A,Z) as follows:

$$\sigma(Z,A) = FY(A,Z) * \sigma_f$$

, where σ_f is the fission cross section of the reaction. The fission fragment production cross section is not mentioned in LEXFOR entries "Fission Yields" and "Production and Emission Cross Sections" except $^{235}U(n,f)^{133g}Xe$ cumulative cross section in coding sample of "Fission Yields". Recently we have prepared two entries for Indian data [1,2] A new quantity code `CHN,SIG` proposed for dictionary 236 in Memo CP-D/483 are used in these entries. The following updates are proposed for both entries.

(1) Proposed addition/correction (underline) to LEXFOR "Fission Yields"

1. **Absolute Yields**. (Fissions and fission fragments are counted independently.)
REACTION coding: The quantity code `FY` in SF6. The yield type is specified in SF5 (Branch) (see under specific type of yield, following pages).
Units: a code from Dictionary 25 with the dimension FY (*e.g.*, `PC/FIS`).

2. **Absolute Cross sections** (Fission fragment production cross section)
The absolute yield may be also expressed by the fission fragment production cross section. The relation between the cross section and fission yield is $\sigma(Z,A) = FY(A,Z)\bullet\sigma_f$, where σ_f is the fission cross section of the reaction.

REACTION coding: The quantity code `SIG` in SF6. The branch codes (SF5) for absolute yields may be also used in coding of fission fragment production cross sections.
Units: a code from Dictionary 25 with the dimension `B` (*e.g.*, `B`).

3. Relative yields.
…
Examples for product nuclei coded within the reaction code:
…

`(92-U-235(N,F)MASS,CHN,FY)`	chain yield of several mass numbers given in the DATA table under the data heading `MASS`.
`(92-U-235(N,F)MASS,CHN,SIG)`	chain cross section of several mass numbers given in the DATA table under the data heading `MASS`.

…

(2) Proposed addition (underline) to LEXFOR "Production and Emission Cross Sections"

Production and Emission Cross Sections

(See **Fission Yields** for fission fragment production cross sections.)

Definition: The **production cross section** for a particle …
…

Reference

[1] S. S. Rattan *et al*., J. Radioanal. Nucl. Chem.. **242** (1999) 551 (EXFOR D6006)
[2] S. Singh *et al*., J. Radioanal. Nucl. Chem.. **279** (2009) 547 (EXFOR D6077)

Distribution:

blokhin@ippe.ru
chiba@earth.sgu.ac.jp
claes.nordborg@oecd.org
emmeric.dupont@oecd.org
ganesan@barc.gov.in
gezg@ciae.ac.cn
hasegawa@nea.fr
henriksson@near.fr
hongwei@ciae.ac.cn
jhchang@kaeri.re.kr
kaltchenko@kinr.kiev.ua
katakura.junichi@jaea.go.jp
kato@nucl.sci.hokudai.ac.jp
kirarlyb@atomki.hu
l.vrapcenjak@iaea.org
manuel.bossant@oecd.org
manokhin@ippe.ru
mmarina@ippe.ru
mwherman@bnl.gov
nicolas.soppera@oecd.org
nklimova@kinr.kiev.ua
n.otsuka@iaea.org
nrdc@jcprg.org
oblozinsky@bnl.gov
ogritzay@kinr.kiev.ua
otto.schwerer@aon.at
r.forrest@iaea.org
samaev@obninsk.ru
s.babykina@polyn.kiae.su
scyang@kaeri.re.kr
s.dunaeva@iaea.org
stakacs@atomki.hu
stanislav.hlavac@savba.sk
taova@expd.vniief.ru
tarkanyi@atomki.hu
varlamov@depni.sinp.msu.ru
vlasov@kinr.kiev.ua
vmclane@optonline.net
v.pronyaev@iaea.org
v.zerkin@iaea.org
yolee@kaeri.re.kr

cc :

sarbjits@barc.gov.in