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Memo CP-M/23

DATE: October 01, 2007
TO: Distribution
FROM: V.Varlamov
SUBJECT: ENTRY L0091 correction.

Dear colleagues,

Unexpectively I found out the important mistakes in content of ENTRY L0091 prepared at the NNDC (HISTORY (20050714C) DR L0091 1 14): in all SUBENTs "(G,X)0-NN-1" must be used instead of "(G,N)".
The reasons are the folowing:
1) the article is very old (J,CJP,35,470,1957) and in that time nobody has known about partial (G,N), (G,2N), (G,3N),...reactions, everybody have measured cross sections of only the total photoneutron reaction;
2) all actinides nuclei reaction cross sections presented in L0091 have absolute values about 1000 - 1500 mb which are of the same order as (G,X)0-NN reactions in modern experiments, for example in L0031, L0050, L0058;
3) modern (G,N) reaction cross sections have absolute values about 300 - 400 mb.

I propose to discuss possibility for needed corrections on upgoing NRDC Meeting.

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Memo CP-E/123

Date: October 4, 2007
To: Distribution
From: OTSUKA Naohiko
Subject: ENTRY L0091 correction
Reference Memo CP-M/23

Excitation functions of (γ,n) reaction and $(\gamma,x+n)$ on ^{238}U and ^{232}Th compiled in EXFOR are plotted for discussion.

(1) L. Katz et al. define $\sigma(\gamma,N)$ as follows:

$$\sigma(\gamma,N) = \sigma(\gamma,n) + 2\,\sigma(\gamma,2n) + \dots + \nu\,\sigma(\gamma,f) + (\nu+1)\,\sigma(\gamma,n+f) + \dots$$

, and they use $\sigma(\gamma,N)$ (not $\sigma(\gamma,n)$) in their captions of Fig.1 to 4.

(2) Above threshold of $(\gamma,2n)$ (about 11 MeV), both R. Bergere et al. (L0082) and L. Katz et al. (L0091) are coded as (γ,n). R. Bergere's data show competition with $(\gamma,2n)$, but Katz's data do not show it.

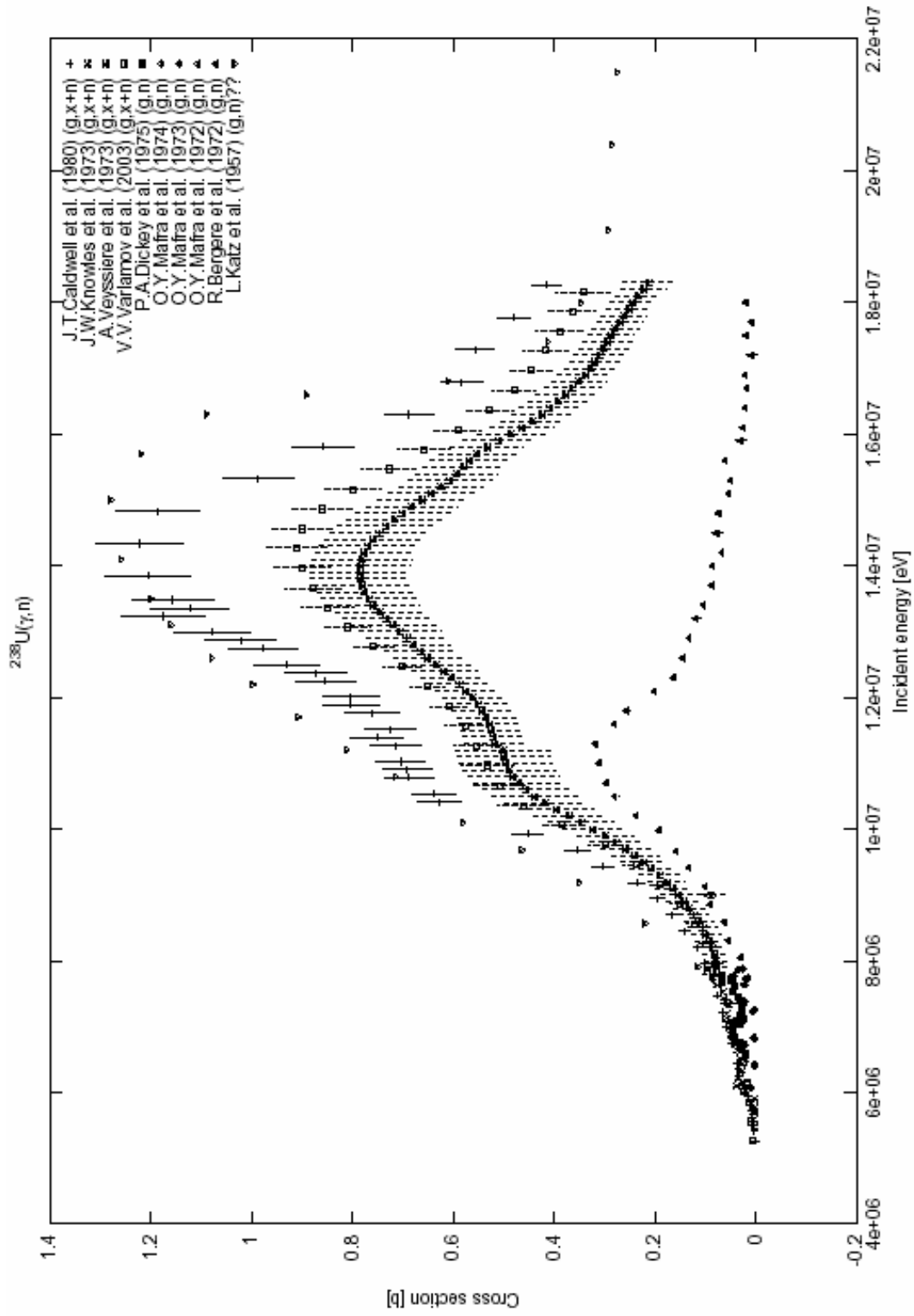(3) Absolute cross section of L. Katz et al. is close to data sets coded as $(\gamma,x+n)$.

Therefore I would like to support the correction proposed in CP-M/23:

        ...(G,N)... to ...(G,X)0-NN-1

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$^{238}U(\gamma,n)$ and $^{238}U(\gamma,x+n)$

^{232}Th(γ,n) and ^{232}Th(γ,x+n)

^{232}Th(γ,n)

Legend:
- J.T.Caldwell et al. (1980) (g,x+n)
- A.Veyssiere et al. (1973) (g,x+n)
- O.Y.Mafra et al. (1972) (g,x+n)
- V.V.Varlamov et al. (2003) (g,x+n)
- P.A.Dickey et al. (1975) (g,n)
- O.Y.Mafra et al. (1974) (g,n)
- R.Bergere et al. (1972) (g,n)
- L.Katz et al. (1957) (g,n) ??

X-axis: Incident energy [eV]
Y-axis: Cross section [b]