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Memo CP-C/331

DATE: January 14, 2004
TO: Distribution
FROM: V. McLane
SUBJECT: Quasi-metastable states

Quasi-metastable states, that is, states with a measurable half-life less than 0.1 seconds, is a problem that I know has been discussed before. Solutions have been proposed, but I don't remember any resolution. (I looked back through the 1996 NRDC Meeting minutes, but didn't see anything).

In correcting some older data, I have come across a case of data measured by activation for some quasi-metastable states. At the time, they were compiled, they were given metastable state numbers. This is not a perfect solution, as there may be metastable states interspersed with these short-lived levels.

I propose that we allow a new set of isomer extensions, L, L1, L2, *etc.* The significance of the extension is simply to link the levels with the decay data, and would be significant only within a given data set. (I think this is similar to what had already been proposed).

An example is given following.

Distribution

M. Chiba, Sapporo
F. E. Chukreev, CAJaD
S. Dunaeva, NDS
S. Taova, 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
CNDC
NNDC File

ENTRY 10493
 SUBENT 10493001
 BIB
 INSTITUTE (1USASMU)
 REFERENCE (J,JIN,37,1121,197505)
 (C,75WASH,2,712,197503)
 AUTHOR (P.K.Eapen,G.N.Salaita)
 TITLE Isomeric cross-section ratios for (n,2n) reactions at
 14.8 MeV
 HISTORY (19750417C)
 ENDBIB
 COMMON
 EN
 MEV
 14.8
 ENDCOMMON
 ENDSUBENT
 SUBENT 10493008
 BIB
 REACTION 1(39-Y-89(N,2N)39-Y-88-L1,,SIG)
 2(39-Y-89(N,2N)39-Y-88-L2,,SIG)
 G(39-Y-89(N,2N)39-Y-88-G,,SIG)
 SAMPLE 99.99% enriched Y2O3 sample.
 DECAY-DATA1(39-Y-88-L1,320.MICROSEC,DG,392.7)
 2(39-Y-88-L2,14.6MSEC,DG,232.2,,DG,442.8)
 G(39-Y-88-G,107.D,DG,898.,,DG,1836.)
 ENDBIB
 NOCOMMON
 DATA

DATA	1DATA-ERR	1DATA	2DATA-ERR	2DATA	GDATA-ERR	G
MB	MB	MB	MB	MB	MB	
96.	8.	227.	18.	1292.	103.	

 ENDDATA
 ENDSUBENT
 SUBENT 10493011
 BIB
 REACTION (39-Y-89(N,2N)39-Y-88-L1+L2/G,,SIG/RAT)
 SAMPLE 99.99% enriched Y2O3 sample.
 DECAY-DATA (39-Y-88-L1,320.MICROSEC,DG,392.7)
 (39-Y-88-L2,14.6MSEC,DG,232.2,,DG,442.8)
 (39-Y-88-G,107.D,DG,898.,,DG,1836.)
 STATUS (DEP,10493008)
 ENDBIB
 NOCOMMON
 DATA

DATA	DATA-ERR
NO-DIM	NO-DIM
0.250	0.030

 ENDDATA
 ENDSUBENT

```

SUBENT          10493018
BIB
REACTION   L(81-TL-203(N,2N)81-TL-202-L,,SIG)
           G(81-TL-203(N,2N)81-TL-202-G,,SIG)
SAMPLE     99.99% enriched TlCl sample.
DECAY-DATAL(81-TL-202-L,536.MICROSEC,DG,459.6,,DG,490.7)
           G(81-TL-202-G,12.5D,DG,439.7,,DG,969.6)
ENDBIB
NOCOMMON
DATA
DATA      LDATA-ERR  LDATA      GDATA-ERR  G
MB         MB        MB         MB
670.       54.       2482.      198.
ENDDATA
ENDSUBENT
SUBENT          10493020
BIB
REACTION   (81-TL-203(N,2N)81-TL-202-L/G,,SIG/RAT)
SAMPLE     99.99% enriched TlCl sample.
DECAY-DATA (81-TL-202-L,536.MICROSEC,DG,459.6,,DG,490.7)
           (81-TL-202-G,12.5D,DG,439.7,,DG,969.6)
STATUS     (DEP,10493018)
ENDBIB
NOCOMMON
DATA
DATA      DATA-ERR
NO-DIM     NO-DIM
0.270      0.036
ENDDATA
ENDSUBENT
ENDENTRY

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