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   S. Maev, CJD
  F. E. Chukreev, CAJaD   O. Schwerer, NDS
  S. Dunaeva, NDS   S. Takács, ATOMKI
  S. Taova, Sarov   F. T. Tárkányi, ATOMKI
  O. Gritzay, KINR   V. Varlamov, CDFE
  K. Kato, JCPDG   CNDC
  M. Kellett, NEADB   NNDC File
  V. N. Manokhin, CJD

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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
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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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