

REPEATED

12.12.88 AM IAEA

MEMO CP-A/52

ACTION

26.08.87.

DEC 2 1988

334-F4.013

To: distribution *)

From: Chukreev F. E.

Subject: Isomeric states (reply to MEMOS CP-G/162, CP-D/151)

ACT OFFIC	J. Schmidt
FOR ACC	
DIS	

Lemmel

The problem of describing the process of isomeric state formation arised long ago and, naturally, its solution could make easier the compiler task.

I would like to begin with the section of short-lived isomeres.

045889

1. Short-lived isomeres

Many our difficulties result from the fact that we have confined ourselves to the list of isomers in Vocabulary 27.

Nearly every nucleus (except the lightest) is in the excited state whose lifetimes lie within wide limits. The isomer state notion itself changes as the experimental technique is moving into the region of measurements of ever shorter times.

We would like to think that our compilations will live longer than their creators and if we proceed from this may be somewhat too daring supposition, then the most reasonable thing we can do is to reject the list of isomers and, hence, the labels in Vocabulary 27.

If one studies excitation of a certain state of the finite nucleus in the reaction this state must be indicated as

(-, -) Z-S-A-L

Where "L" may contain "blank", "G", "Mn" and n is any integer.

*) S. Pearlstein, NNDC
N. Tubbs, NEA-DB
V. N. Manokhin, GJD
J. J. Schmidt, IAEA
F. E. Chukreev, CAJAD
V. V. Varlamov, CDFE

A. Hashizume, RIKEN
H. Tanaka, Study Group
Zhuang Youxiang, IAE-CP
H. D. Lemmel, NDS

The code "blank" has the meaning of formation of the nucleus Z-S-A in the ground state when the way of the nucleus transition into this state from the excited one is not indicated by the authors.

The code "G" has the meaning of formation of the nucleus Z-S-A in the ground state when the authors have taken special measures in order to how the process of its formation in more detail. It is clear that this code can be accompanied by the codes M+, M-, (M) in the fifth field.

The code "Mn" indicates that the authors have studied the cross section of formation of the nucleus in some excited state. The excited state characteristics must be shown in Decay-Data or EN-SEC.

Giving up special separation of excited states to long-lived (M) and short-lived (S or A) offers to the compiler more freedom for a correct description of the modern experiment. Without this we shall always confuse when describing many investigations such as, for example, those where the gamma-ray "on line" output is measured.

Separation to the short-lived and long-lived isomers could be justified only in the case when we were sure that no long-lived isomers are among excited states of nuclei whose lifetimes has not been measured yet.

2. On application of the M+ and M1+M2

In this question we prefer position CP-D/151 rather than CP-C/162. The former, in our opinion, is physically more meaningful.

cc. De Freitas Cunha
Goulo
Kyi
Lammes
Lemmel

Ozorio Fernandez
Oramote
Schmidt
Schweser
Seits

Wang Dahai