MEMO CP-A/101

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To: Distribution
From: F.E.Chukreev
Subject: Transformation of Dictionary #27

The modern experiment allows to accelerate (to create) and to use as a target photons, leptons, mesons and any bound set of nucleons. In this connection role of the Dictionary 27 should be changed.

It would be probably possible to accept the following rules:

1. The fields 1 and 2 **REACTION** can contain:
1.1 photon,
1.2 lepton,
1.3 long-lived meson,
1.4 any bound combination baryons, which can not be destroyed by strong interaction.

2. The fields 3 and 4 **REACTION** can contain:
Any combination
2.1 photons,
2.2 leptons,
2.3 mesons and
2.4 baryons,
allowed by the laws of conservation (Energy, Strangeness, Electrical, Baryon and Lepton charges)

3. **PART-DET**, **RAD-DET** and **DECAY-DATA** (DECAY-MON) can contain only photon, lepton, meson or bound combination nucleons

For example, it is possible to write:
3-LI-6 (P, N) 4-BE-6, IND, SIG, but in **PART-DET** there should be (**A**), or (**N**), as **Be-6** - unbound nucleus, its time of life about nuclear.

It is simultaneously necessary to consider and field **ISOMER** in 27-th Dictionary. The concept isomer continuously extends. Now isomer is the exited state with time of life > 10.E-11 seconds.
In this connection it would be expedient to establish the following rule:

Isomer is any exited state of a nucleus. For Isomer should be necessarily specified or half-life or (and) its excitation energy, or other quantum characteristic. To specify Isomer number unessential. This number can be any.

Thus, the dictionary 27 should give the compiler only items of information on the bound state of baryon systems. A possible view of a line of this dictionary:

Atomic number (Z)	Suitable atomic masses
1	1-3
2	3,4
.....	....
28	50-78
....	.....
94	232,234,236-247

It is necessary to exclude such keyword, as **LVL-NUMB**. The reason of it - if today a level, for example, second, tomorrow it can become third. For investigated nuclear levels a quantum characteristic always is known what. If for a level the energy of excitation or other quantum characteristic is unknown, its identification should be given by the free text. If, for example, in reaction the condition is raised which the author names as second analog and energy of this state is unknown, the compiler should write:

EN-SEC (E-LVL, Z-Sym-A) and free text to specify the appropriate quantum characteristic. For this purpose it is possible to use also existing keyword **LEVEL-PROP**, having permitted to leave empty some fields.

For example, if there is a speech about a level **Si-31**, which is analogue of the basic condition **P-31**, it can be written down:

EN-SEC (E-LVL,14-SI-31)

LEVEL-PROP (14-SI-31, E-LVL =, SPIN=0.5, PARITY=1.) It is analog state of P-31 ground state.

We believe that the offered changes will not cause a long tail of changes in existing entries.

Our offers do not cover important cases, in which one or several nucleons are in the exited states, as, for example, He-4 (Λ) system (strangeness of this system =1) and antinucleus. The problem requires additional consideration.

Distribution:

DUNFORD@BNLND2.DNE.BNL.GOV
VML@BNL.GOV
NORDBORG@NEA.FR
KELLETT@NEA.FR
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HASEGAWA@CRACKER.TOKAI.JAERI.GO.JP
VLASOV@KINR.KIEV.UA
KALTCHENKO@KINR.KIEV.UA
OGRITZAY@KINR.KIEV.UA