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Memo CP-D/479

Date: 20 December 2006
To: Distribution
From: O. Schwerer
Subject: Purported and/or real mistakes in EXFOR
Reference: CP-C/378 (WP 2006-5 of the 2006 NRDC meeting)

We checked the two area 3 entries listed as erroneous in memo CP-C/378. While we appreciate all efforts to systematically find mistakes in the database, we do not agree that these two entries represent errors in compilation which could or should have been avoided at the compilation stage. Rather, these are entries of very old literature which represent the stage of knowledge of their time and are as such represented in EXFOR. To filter out old data of doubtful value, other mechanisms should be used (such as the quality flag recently discussed), while the original database should continue to reflect the status of the published literature; where necessary, compilers may add their comments under the CRITIQUE or COMMENT keywords.

In detail:

Subentry 30322.016: (1973)

Yb-176(n,2n)Yb-175-m cross section at 14 MeV, for 0.067 sec isomer, 5.8 ± 3 barn, “unphysically high”

My remarks:

- 1) The error is $> 50\%$, with the lower margin below 3 barns (Dimitri’s “border of physics”). Anyway, with such a big error, the user will understand that these data have limited significance.
- 2) This is the only measurement in EXFOR for this isomer. Therefore it should only be removed once we definitely know that it does not at all reflect what it intended to reflect.
- 3) The EXFOR entry correctly reports the publication. There is no “mistake” in the entry. Possibly there is a mistake somewhere in the experiment, but we don’t know, and the same is true for many other experiments (and often we may not know about it because some errors may cancel each other....)
- 4) The only possible action I can see would be to add a comment like “Compiler believes that cross section is too high compared with what we would expect and compared with measurements of the

ground state..” but this would be patronizing the user. From the size of the error together with the age of the experiment, the user will understand the (limited) significance of this experiment anyway; otherwise he should probably not use an experimental database at all.

Subentry 31161.010 (1961):

Ag-107(n,2n)Ag-106-m (8.2 d), DATA-APRX = 6500 mb at 14.8 MeV, “unphysically high”

My remarks:

1) This is not DATA but DATA-APRX. This is not correctly understood in the table of CP-C/378. (The table cited it as 6500 mb +- 0.0), but actually authors cite it as approximate value which immediately reduces its significance dramatically. For any automatic procedures for processing or checking EXFOR data, it is essential to differentiate between data and approximate data. Many evaluators or other users may exclude approximate data from their processing (unless no other measurements are available) anyway.

2) The authors themselves give, for comparison, a calculated value of 1460 mb (apparently for the total sum of ground and metastable state), which is much smaller than the approximate experimental value for –M. Thus, the authors understood themselves that their approximate value is unusually high, but this is what they have got.

3) Again, there is no mistake in the compilation; it correctly reflects the published article. From the fact that it is labeled as approximate value, and from the year of publication (1961), the user will be intelligent enough to judge this value. In my view, filtering out such data cannot, and should not, be the task of EXFOR, because the question of “where to draw the line” will introduce much arbitrariness into the system. Filtering out doubtful data must be left to a secondary step (quality flag, or “approved by evaluator XYZ” flag, etc.) without touching the integrity of the original database. In cases of strong indications to the compiler that something is basically wrong which may not be obvious to the user, the keyword COMMENT or CRITIQUE can be used. However, in this case, with DATA-APRX, this would not add much additional information. I believe experimental data must never be used blindly; some amount of judgment on the user’s side is always required.

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