Nuclear Structure and Reaction Data Center

Kurchatov's Institute, Moscow
F.E. Chukreev, S.Yu. Babykina

Progress Report
to IAEA Advisory Group Meeting on Network of Nuclear Reaction Data Centers

15-19 May 2000, Obninsk, Russia

Our EXFOR activity had two main directions:

Compilation for A-library.

After Vienna-99 Technical meeting A046 and A047 TRANSes were prepared. The TRANes contains monitor reaction data, astrophysical data and corrections of some old entries. Astrophysical data compilation will be continued in this year. We would like to compile Bochum's group publications. The group published very many papers regarding to stellar energy sources. The measurements of Bochum's group are well grounded.

Team work with the NEA Data Bank.

New 180 entries were prepared after Vienna-99 Technical Meeting. Some entries we transmitted for T-Library, but majority of prepared entries will be included in O-library. The entries contain differential and integral data oriented for nuclear waste transformation and medical applications.

B-Library correction is finished, but we are waiting very many remarks because EXFOR rules are changing constantly. The library will be put in PRELIM after the meeting, if our meeting will not adopted new essential changing for EXFOR.

WEB access to catalogue of ICPND was created on CDFE site (depni.npi.msu.su) by combined efforts of CAJAD and CDFE. More detail information on the item can be found in CDFE's progress report. We have plan to include another partial catalogues (may be, neutron production cross-section or isomeric ratios) with suitable data. The content of the site is discussed now. At the site we plan to put calculated internal conversion probabilities for isomer transitions of low energies, less than 3 KeV. The data were not published. Only short report, which contains calculation method, was published. The data are needed to analyze conversion electron spectra on outer atomic shells. Similar spectra are very useful to understanding interatomic interactions in solid states.

About some difficulties of our users:

These difficulties can be divided into two groups.

First group. We constantly have questions from our users on type of the data, which are presented in EXFOR. They arise at the people, which try to build models of nuclear reactions, which produced by particles with intermediate energies, when the products are far from a valley

of stability. Lack of the exact information about a type of the measured cross section and details of experiment create these questions, in many cases.

Moreover, there are cases, when the authors of the publication incorrectly specify type of measured cross section (CUM or IND) or incorrect sequence of isomeric states are presented. These mistakes are connected, as to incompleteness of information about radioactive processes on the moment of the publication of research, or with direct mistakes of the authors. It is valid, when in an experiment the cross sections of formation of several tens nuclides are determined, the authors not always have an opportunity in details to analyze genetic connections of obtained products. This task is not always simple. It is enough to mention, for example, Tb-150, which formation in the ground state can be only CUM/M-, and in isomeric state is IND only. In our practice there are some cases, when the authors, not only Russian, asked to check up correctness them IND and CUM before the publication of results.

The second source of similar difficulties is unwillingness of the users to study LEXFOR. They have enough work without it. Therefore they require the "redundant" information. From our colleagues, we have remarks constantly, that the redundant information complicates work of the search programs. It is certainly correct, but the absence of the redundant information complicates work of the users.

Whose interests to us are more important? My opinion, that interests of our users.

Second group. The experimentalists have another problems. The development of experimental technique of measurements of cross-sections short-lived nuclides has given rises new difficulties. In many cases from measurements of gamma-spectra to determine cross section is impossible, as decay scheme is unknown.

It especially frequently meets for odd nuclides. Let’s consider, for example, 188-Au. Its half-life is 8.8 minutes, and product of its decay is 188Pt. Now in ITEP, where the measurements of production cross sections short-lived nuclides are adjusted, the measurements for 188-Au and lot of other isotopes are made. But the determination of cross-section is impossible, because the relative probability gamma radiation is known only. It, in turn, is connected with absence of measurements of probability of decay to ground state of a daughter nucleus. Sometimes we manage to help the experimentalists, but in most cases it appears impossible.

The experimentalists, who study radioactive transformations, similar problems do not disturb. Their efforts are directed on search of bands, superdeformation and other interesting characteristics. And such "trivial" characteristic, as probability of transitions between the ground states remains outside of a field of their interests.

Therefore we address to our colleagues, which can influence on financial distribution for radioactive processes investigations, to take into account needs of modern experiment and theories of nuclear reactions. They could ask the experimenters to not neglect definition of the "trivial" characteristics of radioactive decays.