§11. Study of Methods of Scientific and Industrial Application of Atomic and Molecular Data


Recent fast, significant and remarkable advancement we have witnessed in past decades in areas such as high-tech industries, medical research, environmental science, atmospheric science, fusion sciences as well as other basic sciences including astrophysics and radiation physics and chemistry fully depend on extensive utilization of atomic and molecular (A&M) data for structures basic understanding of various phenomena, but also establishing guiding new key principles and basic technologies based on simulations with this accurate and complete A&M data basis. Without this A&M data basis, such an impressive progress of our technologies and basic understanding of nature would not have been realized.

We undertook this collaborative effort to establish the forum as a platform connecting between A&M data producers and data users to integrate independent and isolated effort of data production and storage so that more efficient and complete data production and transmission could be possible.

In the present research project, we established a non-profit organization (NPO), named “The Forum for the Atomic and Molecular Data And Their Applications”. Summarizing the results of discussions since 2004, we made a draft of documents of the certificate of incorporation and the business scheme, for which discussions were carried out in a working group meeting on 19-Aug-2009. The objectives of the forum is determined to be (1) the establishment of a community of producers of atomic and molecular data and users, (2) promotion of use of data in various fields from basic science to industrial applications, (3) establishment of a system to support operation of the data base. Matching between data producers in universities and national laboratories, and users in private companies are realized by organizing conferences and seminars are determined to be the main activity of the forum. The matching will also be realized through the internet activities using a web site and mailing list, using the Google Groups.

A seminar was held as a part of the activities of the forum on 18 and 19-Feb-2010. We had 35 participants and 15 presentations in 3 sessions, on the underwater discharge plasma, needs of atomic data for modeling plasma processing, and the atomic data and atomic processes of W plasmas for the magnetic fusion plasmas. Underwater plasmas are shown to be a new field of application of the atomic and molecular data. On the other hand, it is found that more discussion is required for the needs and seeds of the data for the plasma processing. It is also suggested that development of another atomic data codes may be necessary to analyze complex W spectrum.

During discussions in working group meetings and seminar, it is also realized that for the efficient matching between data producers and users, each member should open information on their research and development, and the forum will provide appropriate environment of discussions through seminars as well as through internet activities.

(fig.1) Top page of the web site of the A&M data forum.