

## §23. Network of Atomic and Molecular Database Related the Processing Plasmas

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Following progress from the previous year, work on the “**Network of Atomic and Molecular Database related the Processing Plasmas**” project has conducted under the NIFS coordination. This project has included a number of application-related, i.e. plasma processing-including one company, atmospheric and radiological science research groups, and so on.

As a challenge for the 21<sup>st</sup> century compilation and evaluation of these databases, so invaluable for science development and the industry, needs to be enlarged to include data from other areas of science and engineering. This project aims at searching for reliable atomic and molecular databases for further development of the plasma processing technology (e.g. vertical integrated computer-aided design for device processing). In this fiscal year, atmospheric research area has been involved; one consultative meeting was held that discussed the following.

(1) Present status of the on-going issue for the linkage between the IEE Japan data-base and the NIFS data-base. The conclusions from the meeting were that (i) Through Profs. Ito and Nakamura (the IEE Japan), NIFS will keep to negotiate the linkage possibility of the IEE data-base via the NIFS home page, specifically, together with the issues on the data-base royalty and so on (ii) along this way, NIFS has started to extend the project to cover more comprehensive data-base net work system for the atmospheric discharge and upper atmospheric chemical reactions. (iii) Dr. K. Takahashi with Prof. Y. Matsumi reported the present status of the

atomic and molecular data base for the modeling of atmospheric process, emphasizing that the comprehensive network for the data base and its exchanging the information.

(vi) Prof. T. Sato introduced new plasma application of the sterilization of bacteria in water by the corona discharge with the emphasis on the atomic and molecular database.

The debriefing session for the General Coordinated Researches was held and reported as follows.

(2) Since 2003, the product of three years of research was reviewed for the survey of the atomic and molecular data-base related to processing plasma, and for net work of atomic and molecular database related the processing plasma. Also, recent status of the atomic and molecular data needs demanded from new trends in processing plasma as well as from the international thermonuclear reactor design going at Cadarache, France were reported, emphasizing that activities at the Data Center is now expected to be important for research of these applications.

The four papers were invited: 1) Data Needs for Electron Interaction with Plasma Processing and Fusion Plasma Gases (H. Tanaka et al, 1<sup>st</sup> Korea-Japan Joint Seminar on Atomic and Molecular Data for Plasma, 8/31-9/1 2005 Jeju, Korea), 2) Electron Collision Data of C-H Compound Molecules for Plasma Modeling (H.Tanaka et al, 1<sup>st</sup> Research Coordination Meeting of the IAEA’s Coordinated Research Program on Atomic and Molecular Data for Plasma Modeling IAEA, Vienna, Austria 26/9-28/9 2005), 3) Recent Trends in Low-energy Electron Collisions with Gaseous Molecules (H.Tanaka et al. 58<sup>th</sup> Annual Gaseous Electronics Conference 18/10, 2005 Sun Jose, US), 4) Low Energy Electron collision Data for Fluorocarbon Molecules (H. Tanaka et al. 6th International Workshop on Fluorocarbon Plasmas, 19-23 March 2006 Villard de Lans, France).

NIFS report has been arranged for the set of experimental electron-molecule collision cross sections data by H. Tanaka at the Sophia University.

The publications supported partially under this project are referred in each member’s publication list.