Agendas for Research Cooperation in the Japanese Chemical and Materials Industry

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9.1 Abstract

Chemistry plays a significant role in creating new materials because it manipulates and creates new substances at the molecular level. The twenty-first century is regarded as the new chemical age, and the new advanced materials are characterized as designated materials on the molecular level. Based on long-range research and development experience at Toray Industries, the following key points are important for the development of new advanced materials:

1) Strong emphasis on basic research with innovative concepts.
2) Direct risk-taking by corporate executives.
3) Open-minded joint work with users for developing applications.

The new advanced materials are expected to satisfy human needs in futures, and the chemical industry should respond to this growing expectation by research cooperation among competitors in a precompetitive stage.

The following topics are discussed:

1) Industrial trends in the Japanese chemical and materials industries.
2) Competition and cooperation (C & C). Public and private cooperation in R & D activities for innovative future technology.
3) Setting research agendas and organization of the public and private sectors in the Japanese national plan.
4) Perspectives for the chemical industry in the new chemical age.

It should be stressed that the national project was successfully introduced in Japan by the private initiative of an informal working relationship between the industrial and public sectors.

Secondly, it should be emphasized that governments, individually and collectively, can enhance such efforts by creating well-balanced competition and cooperation, a climate of sustained economic growth, by supporting basic research and education. Free competition in the R & D of innovative technology is invaluable. In private industry, short-range R & D to modify existing products in the market is emphasized, whereas the R & D of both the public and private sectors should be focused on technology and new materials for the long-range future. In authors's view, private initiatives not directly by the government are the way to bring about well-balanced
cooperation and competition in R & D for future technology. If this can be brought about, the author foresee a bright future, not just for the chemical industry, but for all sectors of industry. And, best of all, the chief beneficiary of that future will be international society at large. [9.2]

The key issues may be summarized as follows:

1) Excessive competition and duplication of R & D should be eliminated.
2) Unless a given industrial sector is prosperous, individual firms in the sector will not survive.

Based on my experience during 1976–1988 with the government, the Federation of Management of Chemical Industry, Japan (Kobunshi-Doyukai) and the Japanese Round Table (Keidanren), the author will explore the following topics:

1) Industrial trends in the Japanese chemical and materials industries.
2) Public and private cooperation in R & D activities dealing with innovative future technology.
3) Setting research agendas and the organization of research by the public and private sectors – the uniqueness of the Japanese system.
4) Perspectives for the chemical industry in new chemical age.

This chapter emphasizes the importance of private initiatives in the initial informal working relationship with public sectors in 1977-1979 to set up the process of formulating industrial policy by identifying targets and then setting research agendas. In early 1977, the private sector achieved consensus on the basic framework of the project and proposed a draft industrial policy to the government. The author will give readers his impression of U.S.-Japanese competition, based on ten years in the U.S. as a student, scholar, and business executive. In addition, the author will cite an example of an official project concerning the basic technology industries. [9.3]

9.2
Industrial Trends and Restructuring in the Japanese Chemical and Materials Industry

When the chemical industry is envisaged in the framework of Japan’s the long-term future, it is urged to understand and put into practice the policies proposed by the Council of Economic Structural Adjustment for International Cooperation. The concepts of the two Maekawa Reports of May 1985 and the new Maekawa Report of May 1987 are shown in Fig. 9.1 below:

These reports describe how the Japanese structure will change in the period from 1985 to 2000. The manufacturing division is expected to shrink, while the service sector will keep expanding. Annual GNP growth is forecast to drop from the 3.69 % achieved in 1985 to 1–1.5 % in 2000.

The new Maekawa report forecasts that the percentage of manufacturing industry in the GNP will drop from 30.1 % in 1985 to 26.7 % in 2000. Above all, the materials industries, including steel, nonferrous metals, and cements, as well as the chemical industry, are expected to experience severe recession. The system assembly industry