Leaping Forward With Specialty Chemistry

Korea’s specialty chemical industry is poised to become a high-end industry through collaboration with other industries

The chemical industry of Korea has emerged as the No. 1 sector in the domestic manufacturing industry and is the world’s 6th largest chemical industry, playing a pivotal role in the provision of support for the country’s leading industrial sectors. Recently, however, it has faced limitations in growth and lots of difficulties. It has become necessary to develop the new/renewable energy and bio chemistry industries based on environmentally friendly alternative resource technologies, given the focus on environmental and energy-related issues and the slowdown in the growth of the auto and information technology industries, the country’s core industrial sectors, due to reduced demand and increasingly fierce competition.

Continued collaboration between businesses, universities, research institutes and government -- which has served as the engine propelling the country’s economic growth -- will be able to help the country overcome current difficulties and take another leap forward based on the established infrastructure and accumulated potential capability. The specialty chemical industry will also be able to play an important part in such an effort.

As an intermediate material industry that supplies materials to the electronics, textile, shipbuilding and auto industries following their production using raw materials supplied by the petrochemical industry, the specialty chemical industry is a technology-intensive, high value-added industry with considerable industrial ripple effects. This core mainstay industry supplies materials and products used in the electronics, information, mechanical, medical, environmental and energy-related industries. Products produced by the specialty chemical industry include functional chemical materials such as electronic information-related materials, dyestuff, pigment particles, paint, ink, adhesives, additives and compounds used in photography and physiologically active materials like medications, agricultural chemicals, cosmetics and incense.

Dye stuff and pigment particles are used as core raw materials for the dyeing and textile industries, which are front-line industries. Looking at the status of Korea’s textile industry, which is one of the country’s growth engines, the country ranks 5th globally. Future research and development (R&D) efforts in the dyeing industry will focus on various aspects, such as applications to new fiber products and to the development of new printing and dyeing technologies.

As for surface-active agents, the enhancement of competitiveness through the development of products for special uses -- such as cosmetics and medications -- and products for new uses like surface-active agents seems to be the only way to boost profits. Domestic surface-active agent businesses have already secured application know-how concerning the relevant industry. The technological level of general-use products and some items with high added value produced by domestic businesses is nearing that of the top countries.

Adhesives are at a critical turning point due to the increasing keen attention paid to issues related to environmental pollution, global warming and volatile organic compounds (VOCs) under the slogan “Global Green Life.”

Paint is used as a final finishing material for enhancing appearance in a wide range of sectors. Thus, the paint industry is an essential products & materials industry that helps extend products’ service life and stimulate end consumers’ intention to purchase. With the emergence of convergence technology that connects with information, bio and nano technology, energy-saving, highly functional, multi-functional paint technology is expanding and diversifying the scope of participation in the realization of future high-end industries.

Amid the current global economic slowdown, the cosmetics industry is less affected than are other sectors, creating high added value compared to investment. Thus, it is regarded as a leading sustainable growth sector.

Demand for cosmetics is rising amid aging trends, an increase in income earned by women and greater interest in one’s health and well-being. Many women also regard cosmetics as substitutes of high-priced cosmetics to add to being consumables. Thus, high growth is expected in the cosmetics industry, as a sector less sensitive to changes in the economic situation than others.

As for the status of the specialty chemical industry, the world market was valued at USD 1.69 trillion in 2012 and is expected to grow at an annual rate of 5.1 percent on average to USD 2.51 trillion by 2020. Materials, products and innovative technologies provided by the industry are emerging as the core of the 21st century’s new industries, such as those based on information and bio technologies as well as those related to the environment, resource and energy.

Korea accounts for about 2.2 percent of the global specialty chemistry market volume. The volume of domestic consumption and specialty chemistry production stood at KRW 48.39 trillion (USD 47.7 billion) in 2012. The country enjoys competitiveness in specialty chemistry compared to other major countries, but the products it exports are mostly general-purpose products that are mid-to-lower-priced. In 2013, the country exported and imported specialty chemistry products worth USD 8.9 billion (a 9.7 percent y-y-o-y increase) and USD 16.02 billion (a 1 percent y-y-o-y decrease), respectively, posting a trade deficit of USD 7.09 billion.

Export/Import Trends in Specialty Chemistry

As a part of such efforts, the country engages in programs for the following: shared growth between information/electronics industries and energy/environment-related industries by designing related chemical industries as major industrial sectors; the standardization of technology-intensive products and production competitiveness in specialty chemistry compared to other major countries, but the products it exports are mostly general-purpose products that are mid-to-lower-priced. In 2013, the country exported and imported specialty chemistry products worth USD 8.9 billion (a 9.7 percent y-y-o-y increase) and USD 16.02 billion (a 1 percent y-y-o-y decrease), respectively, posting a trade deficit of USD 7.09 billion.

Import/Export Structure of Specialty Chemistry

As the world’s top chemical businesses, Korea’s businesses are focusing on the following to export customized products suited to customers’ needs: securing markets and source technologies; attaining the goal of achieving globalized chemical businesses specializing in functional products in linkage with world-class material businesses; standardizing chemical technologies and products; and providing total solutions that combine catalysts and work processes.

The government has encouraged the industry to focus on enhancing the functionality of materials and technologies for physical property control to improve quality of products and improve their price competitiveness through the construction of a consortium between sectors (e.g., petrochemistry and specialty chemistry).

There is a need to focus the country’s innovative technology capabilities on the appraisal and standardization of the toxicity and stability of chemical materials and to strive to secure source technologies for human-friendly materials that will meet environmental and health-related needs. It should also strive for the development of technologies that minimize environmental risks and products made with such technologies through the promotion of stable, pollution-free, environmentally friendly industries.

Domestic businesses should venture into the global market by using information technology as well as an efficient logistics system. Regarding specialty chemistry materials featuring specific functionality, there is a need to secure source technologies and patent rights to maintain a stable competitive advantage.

The country is accelerating research and investment for the creation of new materials, seeing a slowdown in demand for general-purpose specialty chemistry products and the declining competitiveness of such products. As for the basic chemistry sector, domestic businesses strive to diversify raw material sources to reduce costs and to endeavor to improve production processes through the development of catalysts while engaging in application research for the expansion of demand.

Developing new materials takes time and money, but successful development brings about tremendous ripple effects and high added value. Thus, businesses continue to invest and engage in research, often in collaboration with those outside of the country.

The specialty chemical industry is expected to go beyond the current stage of application of chemical technologies and develop as a high-end industry engaging in the production of new concept products in linkage with information and bio technologies.

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Korea must take measures to strengthen its competitiveness in the chemical industry, maintain it as a cash cow and its position as a core industrial sector, and improve its world ranking by one notch (from 6th to 5th) through collaboration between businesses, particularly large ones.

To that end, the country is pushing ahead with a strategic concentration on securing technology for the application of alternative raw materials and sufficient industrial competitiveness to be an advanced country in the sector through intensive R&D and investment. It also needs diverse technological and economic strategies.

Korea is making great efforts to restructure the existing chemical industry into a sustainable one through the diversification of raw materials (which do not depend too much on petroleum) and the sophistication of the production process, and by securing competitiveness through the production of products with high added value and the development of environmentally friendly products that can meet environmental regulations.

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