

**We are concentrating on the development of next-generation environmentally friendly products and energy conservation products as we work to turn crisis into opportunity.**



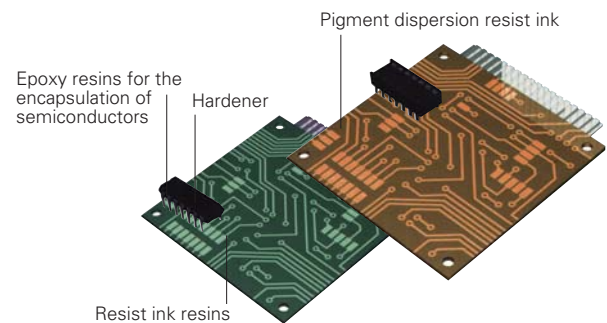
Koichi Takase  
Member of the Board  
Managing Director  
Head of Functional  
Chemicals Group

## Functional Materials Business

### Business Overview

**We develop, manufacture, and sell functional materials such as epoxy resins for semiconductor encapsulation and UV-curing resins.**

The Nippon Kayaku functional materials business comprises the development, manufacture, and sales of materials with a variety of functions, including epoxy resins for semiconductor encapsulation and UV-curing resins. These materials are broadly used for industrial applications, primarily in the electronics field.



### Overview of Operations for the Fiscal Year Ended May 31, 2009

During this year, sales suffered a large-scale decrease despite our efforts to improve our profit-earning structure through steps such as price revisions and development of applications in new fields.

In the functional materials business there was a sudden cooling of the market that began with the bankruptcies related to the subprime loan problem. This led to simultaneous inventory adjustments at companies across the industry, resulting in a harsh market environment unlike anything before. Demand fell sharply as a result, in particular for the epoxy resins used in semiconductor encapsulation. Sales of UV-curing resins were also below the level of the previous fiscal year.

## Future Developments

We are concentrating on the development of next-generation environmentally friendly products from a mid- and long-term perspective.

For the epoxy resins that are used for semiconductor encapsulation, we are concentrating our efforts on further expanding sales of our environmentally friendly NC-3000, a high-end material which has already established a position as the *de facto* standard in the market. At the same time, we will also introduce new environmentally friendly products into the middle-range field, and work to increase demand. For UV-curing resins, we will carry out further cost reductions and work to strengthen our profit-earning structure. We are also planning to market a new polyamide resin for PCBs in the fiscal year ending May 2010.

## Electronic Materials Business

### Business Overview

We develop, manufacture, and sell LCD (liquid crystal display) films, optical disc materials, and other materials that are used in essential components of information/communications devices.

Our consolidated subsidiary Polatechno Co., Ltd. manufactures the special polarizing films that are essential for LCD displays. These polarizing films were developed using dye technology that is one of the original Nippon Kayaku technologies. Unlike the iodine-type polarizing films used in the production of large LCD panels, these products manifest their strength in the niche market of mid- and small-size panels where high durability is required, such as those used in automobile displays.

Nippon Kayaku also markets optical functional films for PDP (plasma display panels), colors for inkjet printers, resins for DVDs and Blu-ray Discs, sealants for LCD panels, and other products.



Sealants for LCD panels

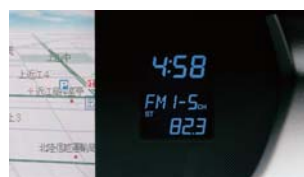
Brightness-boosting sheets for LCD panels



Optical films used in PDP (plasma display panels)



Resins for Blu-ray Discs



Polarizing films for automobile LCD monitors



LCD projector components

### Overview of Operations for the Fiscal Year Ended May 31, 2009

Overall sales declined despite strong sales of colors for inkjet printers.

Sales of colors for inkjet printers continued to grow steadily, however sales of optical disc resins, LCD sealants, and films for plasma displays were all below the levels of the previous year. Sales from Polatechno, which manufactures polarizing films for LCD displays, were also down from the previous fiscal year.

### Future Developments

We are improving our profit-earning structure and developing environmentally friendly products and other new products.

The markets reached bottom in February of 2009, and signs of recovery are visible. However Nippon Kayaku will continue efforts aimed at strengthening our profit-earning structure. We are planning to transfer a portion of our products and processes to a China subsidiary, working to raise our cost competitiveness.

At the same time, we are carrying out proactive measures to ensure that we are not left behind by the economic recovery, including marketing alicyclic epoxy LED sealant resins, and expanding the market for MEMS (micro electro mechanical systems) resists.

# Functional Chemicals Business

## Catalyst Business

### Business Overview

**We develop, manufacture, sell, and provide plant license support for the catalysts that are used in the production of acrylic acid and methacrylic acid.**

The Nippon Kayaku catalyst business comprises the development, manufacture, and sales of catalysts that play a fundamental role in the production of acrylic and methacrylic acid (direct oxidation method). Acrylic acid serves as a raw material for a large number of products. Those products include the SAP (super absorbent polymers) that are utilized in consumer items such as disposable diapers; and also acrylic paints for automobile production, adhesives, RC resins, and other purposes. Methacrylic acid is used in LCD light-guide plates and other optical applications, in products such as transparent plastics for giant aquarium tanks, as well as in automotive parts and artificial marble. Nippon Kayaku catalysts have been highly rated by customers who manufacture acrylic acid and methacrylic acid.

In this field, we are also utilizing our catalyst expertise for business providing technical assistance to plants. Through this business, we provide technologies that are required for the design and operation of plants that produce acrylic acid and methacrylic acid.



### Overview of Operations for the Fiscal Year Ended May 31, 2009

**We succeeded in achieving steady growth in sales.**

With the increase in plants producing acrylic acid and methacrylic acid overseas, our sales grew steadily and exceeded the level of the previous fiscal year.

### Future Developments

**We are improving our profit-earning structure in order to ensure future profits.**

A slowdown in the markets is predicted in the future, and sales are expected to decline. We will work to ensure profits by reducing production costs, through measures such as recycling of raw materials.

## Color Chemicals Business

### Business Overview

**We supply high-quality fabric and paper dyes to the markets in Japan, China, and other countries.**

In addition to the manufacture and sales of textile dyes and dyes for paper pulp, our color chemicals business has become involved in the new field of car seat dyes. Nippon Kayaku dyes are characterized by their high quality, including high fastness, bright colors, and good color reproducibility.



### Overview of Operations for the Fiscal Year Ended May 31, 2009

**Sales of textile dyes decreased, and overall sales were below the level of the previous fiscal year.**

During the fiscal year ended May 31, 2009, although sales of paper dyes were strong during the first half of the fiscal year, the economic slowdown began to affect this business in the autumn, resulting in a drop in sales for both textile and paper dyes. Sales for the color chemicals business as a whole were below the level of the previous fiscal year.

### Future Developments

In June 2009, we established the Export Headquarters and R&D Center on the grounds of Wuxi Advanced Kayaku Chemical Co., Ltd., aiming for growth in the China market and other markets where future expansion is predicted.

We are strengthening our system for production, sales, and technical services in China, and are actively developing new customers in China and other countries.

## Topics

### ● Development of an original manufacturing method for alicyclic epoxy resin, and application to LED sealants

Nippon Kayaku has created a fusion of its original catalyst technology and its newly developed technology for high levels of purification, and has successfully developed technology for the manufacture of alicyclic epoxy resin by the hydrogen peroxide oxidation method, which is believed to ensure safer manufacturing operations. To this base of alicyclic epoxy resin, we are applying compounding technologies and are aiming to market this material as a LED sealant in the fiscal year ending May 2014, with sales expected to exceed 1.0 billion yen. LEDs are an energy-saving light source that consumes little electric power and has a long lifetime. The LED market is expected to expand as LEDs are increasingly used for the light source in LCD displays and ordinary lighting. The LED sealant is an essential material that protects the LED element and its circuits from water and dust. In particular, although silicon sealants are currently the main sealant used for high-brightness white LEDs, a market which is expected to grow, the LED sealant developed by Nippon Kayaku succeeds in delivering better performance than silicon sealants in terms of gas permeability, surface hardness, and adhesive performance.

### ● Joint development with Dupont of a new photosensitive epoxy film

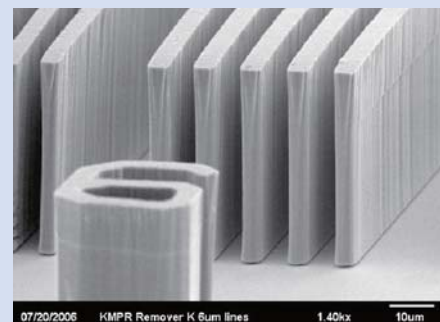
Nippon Kayaku and our U.S. subsidiary company MicroChem Corporation began joint development with the U.S. company Dupont of a new photosensitive epoxy film in January 2009, and is aiming to market the product sometime in 2009. We are closely studying approaches to wafer-level packaging and through-silicon via technology in particular in the semiconductor packaging field where future growth is expected. This photosensitive dry film features higher productivity and higher accuracy than conventional liquid resists, and because it does not involve the use of organic solvents, it helps support environmentally friendly production.

### ● Development of new polyimide and polyamide resins

Nippon Kayaku is engaged in the business of conventional polyimide (PI) and polyamide (PA) resins. We have also recently decided to enter the film material business based on the PI and PA which we developed ourselves. PI and PA are broadly used for flexible printed circuit boards (FPC) and other purposes. Although we are a late entry into this field, we are aiming to increase our share in niche markets such as FPC cover films and bonding sheets.

### ● Strengthening the MEMS materials business

Through our subsidiary Kayaku MicroChem Corporation, Nippon Kayaku has been engaged in domestic and export sales of photo resists, developers, and other materials and devices for MEMS (Micro Electro Mechanical Systems). On April 1, 2009, it was decided to incorporate all of this company's business into the Electronic Materials Division. By incorporating the sales functions in addition to the MEMS photo resist manufacturing, we are aiming to accelerate the pace of marketing and R&D and to expand sales. At present, the size of the global MEMS market has grown to several trillion yen, with the market being driven by actuator products such as nozzles for inkjet printers. In the future, growth is expected in various sensors such as motion sensors, acceleration and pressure sensors, consumer electronics components such as the radio frequency components that are used in cellular telephones and other devices, and three-dimensional, high-density, and other semiconductor packages.



Example of micro-processing using SU-8, the *de facto* standard among epoxy resists for MEMS