

May 29, 2008

## **40<sup>th</sup> Annual JCIA Technology Award Winners**

Japan Chemical Industry Association

The Japan Chemical Industry Association (JCIA) recently announced the winners of its 40<sup>th</sup> Annual Technology Awards. The awards were established to promote the advancement of chemical technology and further development of the chemical industry, and superior chemical technology is commended every year.

From among 6 nominees this year, JCIA's Technology Committee, headed by Mr. Yasuhisa Chiba, Representative Director & Vice President of Ube Industries, Ltd., selected the following three winners:

### **JCIA Technology Award (Grand Prize)**

#### **Kaneka Corporation "Research and Development of Optically Active Pyrrolidinol and Business Expansion through Industrialization"**

Optically active pyrrolidinols are used as intermediates in the manufacture of pharmaceuticals such as anti-cancer drugs, anesthetics, antispasmodics, anti-HIV drugs, and as an intermediate in agrochemicals. Traditionally, the production method of optically active pyrrolidinols was limited: optical resolution, catalytic asymmetric synthesis using expensive catalysts, or multi-step synthesis from natural compounds. Hence, practical and cost effective methodology has been yet to be found.

Kaneka has found a super enzyme that selectively reduces raw material pyrrolidinone to s-pyrrolidinol (pyrrolidinol that is optically active). The company has developed the technology to manufacture optically active pyrrolidinols using an E. coli biocatalyst from both the reductase gene and glucose dehydrogenase gene harnessing coenzyme regeneration function. The integrated system provides an inexpensive and highly efficient solution of s-pyrrolidinol, thus materializing the commercial production.

With the development of this technology, Kaneka increased cost competitiveness which led to a rapid expansion of business. In addition, with this technology the company has reduced the burden on the environment by substantially reducing wastes and reducing of the use of organic solvents.

### **JCIA Technology Award (Special Technology Prize)**

#### **Hitachi Chemical Co., Ltd. "CMP Polishing Material for Insulation Membrane [GPX]"**

In order to increase semiconductor capacity and speed and to lower prices, it is necessary to make semiconductor integrated circuits (IC) more detailed and multi-layered. For chemical mechanical polishing (CMP) slurry to resolve surface unevenness when producing multi-layered IC, it is also necessary to have polishing features such as smoothing the uneven surface, high polishing speed,

and fewer polishing scratches. Although silica (SiO<sub>2</sub>) slurry was traditionally used, polishing speed and resolution of unevenness were not sufficient.

By focusing on the high-speed polishing effects of cerium oxide, Hitachi Chemical has developed cerium oxide polishing particles that can reduce polishing scratches by optimizing the structure and diameter of the particles. Furthermore, to control excess polishing of the layer and to resolve the unevenness on which polishing stops, the company has developed an organic high molecular compound that selectively controls polishing speed. In addition, using cerium oxide particles, Hitachi has developed CMP slurry "GPX" that reduces the unevenness after the polishing to one-tenth that of traditional silica slurry.

"GPX" has now acquired over 50% of market share for DRAM since its adoption by a Japanese semiconductor manufacturer in 1998.

**JCIA Technology Award (Environmental Technology Prize)**

**Kansai Paint Co., Ltd./Sharp Corporation**

**"Development of Plant-originated Resin Paint and Its Application to Home Electric Appliances"**

Traditional plant-based resin paint is inferior in areas such as durability of painted film (adhesiveness to raw materials, solidity, etc.), gloss and appearance, in addition to low productivity and workability.

Kansai Paint has improved esterified cornstarch plant-based paints by adjusting the amount of the molecule, adjusting crosslink density, incorporating hardeners, and selecting additional improved components. Since March 2006, this paint has been used on the stand of Sharp's liquid crystal display AQUOS TV. It marked the first time in the world that plant-based resin paint was applied to plastic parts for industrial use.

Using this paint, carbon dioxide reduction equals 28g of CO<sub>2</sub> conversion for each AQUOS TV set. If the paint is used on six million units, the volume equals 168 tons. Industrial use of this paint on plastic parts and components will have a substantial effect on the preservation of our global environment.

The awards ceremony will be held at the 17<sup>th</sup> JCIA Annual Convention to be held on May 30, 2008

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