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INTRODUCTION

The global superabsorbent polymer (SAP) market, growing at approximately 7% p.a., is considered to be one of the fastest growing in the chemical industry. SAP demand from developing Asian economies has been especially robust. We profile some of the leading Japanese producers of SAP in this issue.

We hope you find *Asian Specialty Chemicals Newsletter* informative. BDA is a corporate finance advisory firm which helps clients to identify and to execute acquisitions and JVs in Asia. If you think that BDA's services may be useful to you, please contact us in New York at (212) 265-5300, Singapore at (65) 533-8500 or via e-mail at erellie@bdallc.com.

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CHINA/HK

Bayer will start building a US$110m plant for polyurethane coatings raw materials in Shanghai, China. The plant is due to come on stream in 2003, and will have a capacity of 11,500tpa for TDI- and HDI-based polyisocyanates. (February 1, 2001)

BP, through its subsidiary **Amoco Zhuhai Chemical Co**, is starting to construct a new purified terephthalic acid (PTA) facility in China. The plant is slated for completion in Q4 2002. (January 23, 2001)

CNPC Daqing Refining & Chemical Industrial Co has developed a compound ionic polyacrylamide for applications in oil recovery, paper-making, environmental protection and textiles. The company is the largest polyacrylamide producer in China, with an output of 50,000tpa of anionic polyacrylamide for oilfield use. (January 24, 2001)

DuPont-Honji Films Foshan Co has formed a partnership with **Nongbo Wuzhou Films** to produce 10tpa of polyester films. Its products will be sold in Shanghai and neighboring regions. Under the partnership agreement, DuPont-Honji will purchase Nongbo Wuzhou's production line in 2004. DuPont-Honji is a JV established by **DuPont Teijin Films** in China. DuPont Teijin Films has a total polyester film production capacity of 300tpa. (January 30, 2001)

Jinzhou Jinex Lubricant Additive Co Ltd (Jinex), a subsidiary of **Infineum**, has successfully started up a 30,000tpa polyisobutylene (PIB) unit in Jinzhou, China that will produce international-quality lube oil additives. This is the beginning of several initiatives to enable Jinex to become the first domestic integrated additive plant offering international standard products in China. PIB manufactured by the Jinex facility will be used as the key raw material for manufacturing dispersant additives. Infineum is a JV between ExxonMobil Chemical Company, The Shell Petroleum Company Ltd and Shell Oil Company. (January 16, 2001)

LG Chemical of Korea will upgrade its facilities to increase its ABS capacity from 550,000tpa to 700,000tpa. **Ningbo LG Yongxing Chemical Co Ltd**, a JV with **Yongxing Chemical** of China, raised its ABS capacity from 60,000tpa to 150,000tpa. The company expects to complete another upgrade that will boost capacity to 300,000tpa by H2 2002. The company estimates ABS demand in China to reach 1.65 million tpa, while domestic supply will only amount to 330,000tpa in 2000. (January 19, 2001)

Nanjing Yangzi Eastman Chemical Ltd, a JV between **Eastman Chemical Ltd** and **Yangzi Petrochemical Industrial Corp**, started production of Eastotac hydrocarbon tackifying resins. The resins are used to manufacture adhesives. The Nanjing plant is the first JV in China as well as the first plant outside the US to produce Eastotac resin. Eastotac resins are used in pressure-sensitive adhesives, hot-melt adhesives, caulks and sealants. (January 12, 2001)

Nippon Kayaku of Japan will increase its water-soluble dye capacity in China from 600 to 1,000tpa at its **Wuxi Advanced Chemicals** subsidiary. The final production stage will be expanded to increase throughput. Completion is expected by Q3 2001. Nippon Kayaku has also acquired **Bada Chemical Factory**'s 20% stake in Wuxi Advanced Chemicals. (February 7, 2001)

Solutia Inc of the US and **Wujin Fine Chemicals** of China have established a JV, **Xiafeng Fine Chemical Co Ltd**. Solutia will hold a 51% stake in this venture, which will market phosphonate products. The company expects to achieve annual sales of RMB60m (US$7m). (January 15, 2001)

Xi'an Tianyun Industrial Co Ltd of China has brought onstream a 3,500tpa first phase acrylic resin production line. Commercial production is expected to begin shortly. (January 16, 2001)

INDIA

Ciba Specialty Chemicals of Switzerland intends to discontinue its performance polymers business in India by the end of Q1 2001. It will sell its 76% stake in **Petro-Araldite**, a JV with **Tamale Nada Pert Products**, to equity fund **Morgan Greenfield**. Morgan Greenfield has acquired the marketing rights for the company's performance polymers, including the *Araldite* brand, for Rup400m (US$8.6m). The divestiture of Ciba's performance polymer division has raised a total of US$23m. (January 29, 2001)

Ciba Specialty Chemicals has opened a new US$7m, 2000tpa polymer antioxidants plant at Santa Monica Works in Goa, India. Ciba's main antioxidants, *Irganox 1010* and *Irganox 1076*, will be produced at this plant for sale to the domestic market. Ciba's three other antioxidant plants in Asia are in Japan, Taiwan and China. (January 30, 2001)

LG Polymers India (LGPI), a 100% owned subsidiary of Korea-based **LG Chemical**, is expected to withdraw its plan of constructing a polymer plant in Dahej, Gujarat. The plant would have produced EPS, PS and value-added styrenic products. LGPI has hoped to boost its operation in India through the Dahej unit. The possible change in plan is believed to be the result of **BASF**'s acquisition of the 60,000tpa PS plant of **Pushpa Polymers**. (February 16, 2001)

INDONESIA

Ferro of the US has commenced operations at its color masterbatch plant in Jakarta, Indonesia in which it invested US$2m. The present capacity is 2,500tpa. Ferro will invest an additional US$3m to increase the total production capacity to 5,000tpa. (January 8, 2001)

Tomen and **Nippon Shokubai**, both of Japan, will pay US$24m for **PT Tri Polyta**'s 45% share in their acrylic acid JV, **PT Nisshoku Tripolyta Acrylindo**. The company operates a 60,000tpa acrylic acid unit at Cilegon, Indonesia. Nippon Shokubai previously owned 50% of the JV, and Tomen 5%. (December 4, 2000)

JAPAN

Akzo Nobel Resins BV of the Netherlands and **Mitsubishi Rayon** of Japan have formed a JV to produce high performance coating resins. The company will develop environmentally friendly acrylic waterborne paints and paints containing a high level of solids. Its products will be supplied to automotive manufacturers worldwide through a series of swap arrangements. The company is targeting a 10% share of the Japanese water-based acrylic paint market within five years. (December 21, 2000)

Ciba Specialty Chemicals of Switzerland will raise its stake in **Musashino Chemical Laboratory** of Japan from 50% to 60%. This will increase Ciba's sales of antioxidants and UV absorbers in the Asia Pacific region. (January 30, 2001)

Daikin Industries of Japan plans to invest about ¥40bn (US$344m) to increase its fluorochemicals production capacity by 50%. Of the total investment, 65% will be spent on its Daikin's facilities in Japan, 20% will be spent on similar efforts in the US and 15% in Europe. Daikin expects to increase fluorochemical sales by 80% to approximately ¥150bn (US$1.3bn) by FY 2003. Daikin presently holds a 25% share of the global fluorochemicals market. (January 26, 2001)

Mitsubishi Chemical will invest ¥10bn (US$86m) to increase polybutylene terephthalate capacity from 60,000tpa to 80,000tpa at its Yokkaichi, Japan facility. (January 11, 2001)

Mitsui Chemical is to be the exclusive distributor of **Ticona**'s cycloolefin copolymers (COC) in Japan. Ticona, a unit of **Celanese AG** of Germany, will market and distribute COC in Asia ex-Japan and India from its regional headquarters in Singapore. (February 15, 2001)

Toray Industries Inc of Japan has acquired the polyphenylene sulfide (PPS) fiber unit of California-based **American Fibers & Yarns Co (AFY)**, for an undisclosed amount. The company now holds 60% of the global PPS fiber market. The acquisition will enable Toray to achieve ¥1bn (US$8.5m) in sales of PPS fiber by March 2002. Toray launched its PPS resin business in 1986 and began producing PPS fiber in 1998. The fiber is resistant to heat and chemicals and is used mainly as dust chamber filters for coal boilers. AFY also produces polypropylene fiber for use in automobiles and home interior. It holds an estimated 50% of the global PPS fiber market. (January 31, 2001)

Teikoku Chemical Industries Co Ltd, a member of the **Nagase Group**, announced that it will merge with three other group companies: **Nagase Chemicals Ltd**, **Nagase Biochemicals Ltd**, and **Nagase Chemtex Co Ltd**. The new company will be capitalized at ¥2.4bn (US$20m) and have annual sales of approximately ¥25bn (US$212m). It will begin operations on April 1, 2001. The principal businesses will be organic synthesis, biotechnology, fine chemicals and electronics. (February 8, 2001)

Toyo-Morton, a JV between **Rohm and Haas** and **Toyo Ink Manufacturing**, will build a new resin plant at the Kawagoe site of **Nippon Polymer**. This is to supplement extra capacity for raw acrylic emulsion that was brought onstream in 2000. Investment in the additional site totals ¥4bn (US$34m). (February 7, 2001)

KOREA

BASF of Germany intends to establish a 140,000tpa toluene diisocyanate production unit in Yosu, Korea in 2003. The company has entered into a strategic alliance with **Hanwha Chemical Corporation**.

Hanwha will supply BASF with chlorine in exchange for hydrochloric acid resulting from toluene diisocyanates production. BASF is also planning to double production capacity to 160,000tpa at its methylene diphenyl isocyanat unit by 2004. These projects are part of a US$400m investment program in Asia. (December 4, 2000)

Saehan Industry of Korea sold 80% of its stake in **Pacific Epoxy** to **Dow Chemical** for W7bn (US$6m). Saehan Industry will retain its remaining 20% stake. Pacific Epoxy has annual sales of W28.5bn (US$227m) and a production capacity of 12,000tpa of converted epoxy resins, most of which is sold in the domestic market. Demand for epoxy resins in Korea totaled 60,000tons in 2000 and is expected to exceed 100,000tons by 2010. (January 29, 2001)

MALAYSIA

Dairen Chemical Corporation (DCC) of Taiwan will invest at least another RM100m (US$26.3m) under phase two of its manufacturing plant development at Tanjong Langsat Industrial Estate in Johor. Its existing plant, **Dairen Chemical (M) Sdn Bhd**, began operation in November 2000 and has a production capacity of 30,000tpa. 20% of its production is supplied to the local market while tbe remaining is exported to Southeast Asia. The production capacity will grow to 240,000tpa upon completion of the phase two project. DCC is one of Asia's largest producer of industrial adhesive ethylene vinyl acetate (EVA) with an estimated 80% share of the Southeast Asia market. (February 16, 2001)

Pan Malaysia Corp Bhd will increase its stake in **Chemical Company of Malaysia Bhd (CCM)** from 10% to 23%. This is expected to make Pan Malaysia Corp Bhd the single largest shareholder in the company. CCM makes industrial chemicals and agrochemicals and has interests in the healthcare sector. (December 15, 2000)

BP Amoco plc of the UK plans to build a new 65,000 tpa trimellitic anhydride (TMA) facility at its existing purified terephthalic acid (PTA) complex in Kuantan, Malaysia. BP expects to complete the US$150m TMA plant by the end of 2002. This will double BP Amoco's TMA capacity to 130,000 tpa. The facility also operates a 600,000 tpa unit to make PTA for polyester. (January 24, 2001)

PHILIPPINES

Mabuhay Vinyl Corp (MVC) of Philippines will sell its 49% stake in **Philippine Resins Industries Inc (PRII)** for P884.9m (US$18.5m) to **Tosoh Corp** and **Mitsubishi Corp** of Japan (both co-shareholders in PRII). The selling price is equivalent to 1.2 times the book value of PRII as of June 30, 2000. MVC will concentrate on its chlor-alkali business and will pursue expansion in this area. MVC has also offered to transfer its PVC marketing and sales operations to PRII for P120m (US$2.5m). The offer will be valid until March 12, 2001. MVC has yet to receive PRII's reply on its PVC offer. (February 13, 2001)

TAIWAN

Asahi Kasei Corp of Japan and **Chimei** of Taiwan will form a JV to build a 30,000tpa PMMA (polymethylmethacrylate) plant in Taiwan. Chimei will build and operate the plant, supplying MMA polymer to Asahi Kasei. Demand for MMA polymer is increasing worldwide, particularly in Asia. Asahi Kasei currently has 45,000tpa of MMA capacity and Chimei has 60,000tpa of poly-MMA capacity. (January 31, 2001)

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Chang Chun Petrochemical Group of Taiwan is increasing its investments in ethylene, propylene derivatives and specialty chemicals. It is planning to build a 60,000tpa polybutylene terephthalate facility in Kaohsiung, Taiwan during 2001, in addition to starting up a 240,000tpa VAM plant in 2000. The company is also considering a 20,000tpa polytetramethylene ether glycol (PTMEG) project and the expansion of a butanediol plant to 100,000tpa during 2001. (January 5, 2001)

China American Petrochemical Co of Taiwan, 50% owned by **BP**, received approval to build a 600,000tpa purified terephthalic acid (PTA) plant at Taichung, Taiwan. The company has five plants in Kaoshiung, Taiwan, with a total capacity of 1.4 million tpa. (January 29, 2001)

Formosa Plastics Group of Taiwan and **Idemitsu Petrochemical Co** of Japan will form a JV in Taiwan, to be officially launched in March 2001. The JV will undertake the second stage expansion of Idemitsu's polycarbonate facility to increase capacity to 10,000tpa by the end of 2002. Work on the first stage (50,000tpa capacity) is expected to be completed by the end of 2001. (January 3, 2001)

THAILAND

Asahi Kasei of Japan increased its capacity for compound production at its **Asahi Kasei Plastics Thailand (APT)** subsidiary to 20,000tpa. A significant increase in demand for plastic compounds is expected in Thailand as foreign automotive manufacturers move their operations into Thailand from Japan and the West. Three 7,000tpa compounding lines have been installed by APT in Ayutthaya. (February 15, 2001)

Atofina of France has started production of flame retardants at its new 12,000tpa flame retardants plant near Bangkok. The EUR4m (US$4m) plant will complement Atofina's 13,000tpa plant in Singapore that supplies flame retardants for use in electronic materials and equipment. Atofina is the world's fourth largest producer of flame retardants, and has facilities in France, Spain, the UK and the US. (January 31, 2001)

BASF of Germany opened a new plant for the production of super-absorbent polymers (SAPs) in Rayong, Thailand. **Chemdal International Corp** began construction of the plant prior to the acquisition of the project by BASF in 2000. The plant will have a production capacity of 20,000tpa and will supply Thailand and other Asian countries. BASF is the world's leading producer of SAPs and acrylic acid. It is the only company to have production facilities for both products in America, Europe and Asia. (January 15, 2001)

Gun Ei Chemical Industry Co and **Nissho Iwai Corp**, both of Japan, will expand their JV in Thailand to increase phenolic resin production. The companies expect a surge in demand for the autoparts material with a recovery in the Thai auto parts industry. The JV will invest an estimated ¥200m (US$24.2m) to expand its production capacity to 15,000-16,000tpa by June 2001. The JV's sales in 2000 were approximately 7,600 tons. It expects to achieve sales of 8,000 tons in 2001 and 10,000 tons in 2004. (January 19, 2001)

FOCUS

The superabsorbent polymer (SAP) market in Japan

Global SAP market overview

SAPs refers to partially cross-linked sodium polyacrylates, a material capable of absorbing up to 30 times their weight. Their main end-use is as an absorbent in disposable diapers. The world SAP market is growing at about 7% p.a., and is considered to be one of the fastest growing segments in the chemical industry. Demand from disposable baby diaper makers is growing steadily in developed countries. Demand for adult incontinence diapers is also expected to grow at a slightly higher rate as populations age. Further growth of the SAP market is anticipated in the long term due to new applications under development. The table below shows the global market leaders.

Company	Capacity (tpa)
BASF, Germany	430,000
Stockhausen, Germany	295,000
Nippon Shokubai, Japan	230,000
Sanyo Chemical, Japan	180,000
Dow Chemical, US	180,000
Sumitomo Seika, Japan	75,000

Japanese SAP market overview

In the Japanese market, consumption of paper diapers for adults continues to increase as the population ages. The production of SAP for the first half of 2000 in Japan totaled 115,278 tons, an increase of 7.8% from the previous term. 39.2% was sold domestically, and the remaining was shipped to foreign markets, primarily to meet increased demand in Southeast Asia and Central America.

The domestic market is consolidated, with **Nippon Shokubai** and **Sanyo Chemical Industries** accounting for more than 60% of the domestic market. We feature the top three manufacturers in the Japan market:

1. Nippon Shokubai

Summary: The company is the largest SAP producer in Japan and third largest in the global market, with a production capacity of 230,000tpa. Its key products incude acrylic acid, acrylic ester, SAP, catalysts and environmental systems.

SAP production: Nippon Shokubai produces 230,000tpa of SAP at its facilities in Belgium, Japan, and the US. The production capacities of its SAP plants are: Himeji plant, Japan - 140,000tpa; Antwerp plant, Belgium - 30,000tpa; and NA Industries in the US – 60,000tpa. It previously consigned production of 24,000tpa of SAP to BASF, but this arrangement was canceled in January 1999. Nippon Shokubai also has a global acrylic acid capacity of 340,000tpa. Acrylic acid is the key raw material for the production of SAP. 220,000tpa of acrylic acid is from its plant at Himeji, Japan; 60,000tpa from its JV, PT Nisshoku Tripolyta Acrylindo in Indonesia; and 60,000tpa from American Acryl, a 50:50 JV between its US subsidiary, NA Industries and Atofina Chemicals.

Fiscal 1999 financials (ending March 2000):

Revenues	¥162.5bn (US$1.4bn)
Operating profit	¥6.6bn (US$56.9m)
Net profit	¥2.7bn (US$22.9m)

2. Sanyo Chemical Industries

Summary: Sanyo Chemicals is a member of the Tomen group. It was the first company in the world to commercialize SAPs, and is the second largest producer of SAPs in Japan. Its key products are surfactants, polyurethane, toner resin, SAP and high-molecular agents. In April 2001, Sanyo Chemical and Mitsubishi will merge their SAP businesses in Japan, creating a 60:40 JV.

SAP Production: Sanyo Chemical's Nagoya factory produces 85,000tpa of SAP. Together with Hoechst, a licensee of the technology, the company has a capacity totaling about 180,000tpa in Japan, the US and Europe.

Fiscal 1999 financials (ending March 2000):

Revenues	¥81.5bn (US$700m)
Operating profit	¥10.2bn (US$87.3m)
Net profit	¥5.4bn (US$46.2m)

3. Sumitomo Seika Chemicals

Summary: Sumitomo Seika Chemicals, an affiliate of Sumitomo Chemical, was established in 1944. The company has recently been focusing on developing its fine chemicals business, including water-absorbent resins and pharmaceutical intermediates. The total production capacity of SAP is 75,000tpa. Products include polymers, functional chemical products, industrial gases, fine chemicals and other industrial chemicals.

SAP production: Sumitomo Seika produces 48,000tpa of SAP through one of its plants in Japan, and 27,000tpa of SAP at another facility in Singapore. The Singapore facility started commercial operations in March 1999.

Fiscal 1999 financials (ending March 2000):

Revenues	¥41.8bn (US$360m)
Operating profit	¥1.6bn (US$13.8m)
Net profit	¥568m (US$4.9m)

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