

SAP

8-21 August 2005

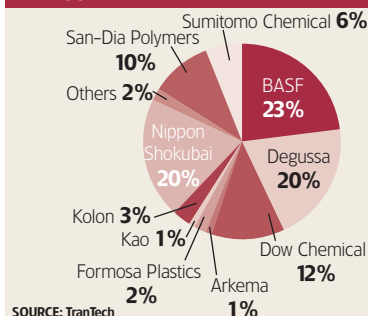
MAJOR GLOBAL SAP CAPACITY, '000 TONNE/YEAR

Company	Country	Capacity
western Europe		
Arkema	France	12
BASF	Belgium	110
Degussa	Germany	120
Dow Chemical	Germany	70
Nippon Shokubai	Belgium	60
US		
BASF		160
Degussa		170
Dow Chemical		80
Nippon Shokubai		60
Japan		
Kao		10
Nippon Shokubai		170
San-Dia Polymers		130
Sumitomo		47
Asia-Pacific		
BASF	Thailand	20
Formosa Plastics	Taiwan	35
Kolon	South Korea	41
Nippon Shokubai	China	30
San-Dia Polymers	China	20
SongWon	South Korea	6
Sumitomo	Singapore	35

SOURCE: TRANTECH

For other producers and details of capacity, output and location: www.chemplan.com
Profile last published 23 September 2002;
Chemical Profile is published fortnightly.

GLOBAL MARKET SHARES FOR SAP IN 2004



SOURCE: TranTech

USES

Superabsorbent polymers (SAP) are able to absorb and retain large volumes of water and aqueous solutions. They are mostly made from partially neutralised, lightly crosslinked polyacrylic acids and are the key ingredients in disposable nappies, feminine hygiene and adult incontinence products.

Over 90% of SAP output is used in personal care applications. About 77.5% of global acrylic SAP is used in nappies, 9.5% in adult incontinence products, 4% in feminine hygiene, 3.8% in agriculture, 1% in construction, 0.4-0.6% each in packaging, cable, pharmaceutical, fire fighting and waste treatment.

Acrylic SAP is also used in petroleum, batteries and some 20 other applications. Almost all SAP is produced as powder.

SUPPLY/DEMAND

According to TranTech, global capacity for SAP stood at over 1.3m tonne in 2004, 430 000 tonne of which was in the US followed closely by Japan and western Europe, with 378 000 tonne and 358 000 tonne, respectively. Asia-Pacific, excluding Japan, was a distant third with 175 000 tonne.

The consumption pattern in the US, western Europe, Japan and Asia-Pacific was 28.7%, 27.1%, 14.4% and 10% respectively. There is a high volume of export/import flow between various world regions with Japan topping the list with 196 000 net exports.

SAP is the largest outlet for glacial acrylic acid, consuming some 852 000 tonne/year.

PRICING

The price of SAP depends on absorption under load, fluid uptake rate, residual monomer content, polymer extractables, acquisition rate and gel strength, which varies from one application to another.

Crosslinked homopolymer acrylic SAP prices were negotiated between €1.4/kg and €1.6/kg in 2004. Prices have increased in 2005 by 10%, mainly due to the increased glacial acrylic price.

TECHNOLOGY

Acrylic SAP manufacturing is usually a four, and in some cases a three-step, process. The polymer is made by aqueous solution polymerisation of glacial acrylic acid with crosslinking monomer and an initiator. Acrylamide is used as well as comonomer for some industrial applications. Neutralisation is carried out

pre- or post-polymerisation depending on the type of reactor and reaction conditions.

The polymer is a soft, rubbery gel that is colourless and clear. The soft gel intermediate is placed on a belt and run through a long tunnel that blows hot air for drying. A drum dryer is also used to a lesser extent.

The dried hard cake is ground to granular amorphous powder. Finally, the tiny particles undergo further crosslinking mostly at the surface to reduce extractable polymers and residual monomer. Another round of heating causes a reaction that yields the final cross-linked product.

Almost 92.3% of world capacity is based on aqueous solution polymerisation. About 7% of capacity is based on inverse suspension polymerisation that results in micro beads.

HEALTH AND SAFETY

SAP is white and odourless with peak distribution size of 800-1000 micrometers. Although SAP can irritate the eyes and skin, it is a non-toxic material as long as certain conditions on impurities are met. Impurities can include residual monomer and crosslinker, by-product formed by side reactions of the catalyst, extractable polymers and heavy metals.

For hygiene applications, the residual acrylic acid content must be less than 100 ppm. The extractable polymer is normally between 4 and 6%. For plant applications the residual acrylic acid and acrylamide contents are below 600 and 25 ppm respectively.

OUTLOOK

Demand for SAP has been rising steadily for three decades. Global demand growth is forecast at 6%/year to 2010, the highest growth rates being expected in Asia-Pacific (12%), Asia/Middle East (8.5%), Australia/New Zealand (8%), Latin America (6%), the US (4.3%) and western Europe (4.8%).

Non-hygiene applications will grow faster than hygiene uses. Biodegradable SAP will play an increasingly important role in the next five years. The major players have been growing capacity to meet the projected demand. Any shortage of supply within the next five years may be due to a lack of available glacial acrylic acid feedstock.

Profile provided by Trantech
 E-mail: amirnazmi@chemplan.com