

CHEMFACTS JAPAN

1981

CHEMICAL DATA SERVICES

IPC INDUSTRIAL PRESS LTD • SUTTON • SURREY • ENGLAND

First edition 1981

Price £70

ISBN 0 617 00250 9

© IPC Business Press Ltd 1981

Reproduction strictly prohibited without publisher's written agreement

Published by **CHEMICAL DATA SERVICES**

IPC Industrial Press Ltd., Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS, England

Tel: 01-661 3500 Telex: 892084 Bisprs G

Registered at the above address, No. 113326, England

FOREWORD

The Japanese chemical industry is in a state of change. The dependence on increasingly expensive naphtha feedstock has led to a decline in competitiveness in the petrochemical and fertilizer industries. Efforts at diversification have resulted in the increased output of higher value-added products such as engineering resins, specialty chemicals and pharmaceuticals. In planning for the future, various government-promoted research projects are under way, with the aim of developing new sources of energy and the technology for production of various chemicals from coal, natural gas, heavy oil and oil shale, as alternatives to naphtha feedstock.

Surveying the present position of the industry in Japan, this entirely new addition to the CDS Chemfacts series covers 103 major industrial chemicals and 235 chemical manufacturers.

In Section 1 each product profile starts with a product description, followed by tables giving figures for production, imports and exports covering a period of ten years, and tables of trade breakdowns for 1979 and 1980, including percentages of the volume of trade with the major importing and exporting countries; an asterisk indicates estimated figures. In addition a plant data table lists manufacturing details, and wherever possible states capacity figures for each product. Where company information was not available, figures based on estimates from reliable published sources have been included. In these cases, the designation 'Estimated capacity' appears in the Remarks section. Where neither company information nor reliable estimates were available, the capacity columns have been left blank. A map of Japan showing the locations of the plants listed and described completes each product profile. Section 2 consists of profiles of 235 chemical manufacturers mentioned in the plant data tables in Section 1.

During this year we have conducted a detailed postal survey of chemical companies in Japan, and we would like to thank them for their willing help in checking and where necessary amplifying our data. Their response has been supplemented by the study of published sources, including official statistics, company annual reports, and leading chemical, industrial and economic journals and newspapers published throughout the world.

While every care has been taken to ensure that the information given is accurate, under no circumstances can the publishers be liable in respect of any errors in or omissions from this survey.

Sutton, Surrey, England

December 1981

Chemical Data Services

Product Data: George Cranford

Plant Data: Martin Edwards

Company Profiles: Carol Rowland

TABLE OF CONTENTS

		Page
Section 1 :	Chemical Product Profiles These consist of 17 inorganic chemicals, 57 organic chemicals, 6 fertilizers and 23 polymers arranged alphabetically under product headings, listed and indexed on Divider Card 1. Information comprises product description, with the French, German, Italian and Spanish translation of the product name; market trends in production, imports and exports; trade breakdowns for imports and exports for 1979 and 1980; plant data stating plant locations and, where available, actual and planned capacities for each major chemical producer, and any details on processes, feedstocks, licensors and contractors. A map indicating plant locations and major neighbouring cities is included for every product.	7
Section 2 :	Company Information..... 235 companies named in Section 1 are alphabetically arranged: Divider Card 2 carries an index. Information comprises company address and, where available, directorate, details of history and present-day structure, number of employees, financial details, domestic and foreign subsidiaries, details of ownership, manufacturing activities etc.	131
	List of Companies and their Products surveyed in this volume.....	193

Note: the following abbreviations are used in Section 1.

P = Process F = Feedstock L = Licensor C = Contractor

— = None . . . = No details stated/Not available

*Estimated figure

NOTES

SECTION 1

CHEMICAL PRODUCT PROFILES

Product	Page	Product	Page
ABS Resins	1	Maleic Anhydride	63
Acetaldehyde	2	Melamine	64
Acetic Acid	3	Methanol	65
Acetic Anhydride	5	Methylamines	66
Acetone	6	Methyl Ethyl Ketone	67
Acrylic Esters	7	Methyl Methacrylate	68
Acrylic Fibres	8	Monochloroacetic Acid	69
Acrylic Resins	9	Nitric Acid	70
Acrylonitrile	11	Nitrile Rubber	71
Adipic Acid	12	<i>n</i> -Paraffins	72
Aluminium Sulphate	13	Pentaerythritol	73
Ammonia	15	Perchloroethylene	74
Ammonium Nitrate	17	Phenol	75
Ammonium Phosphates	18	Phosphoric Acid	76
Aniline	20	Phthalic Anhydride	78
Benzene	21	Polyacetal Resins	79
Benzoic Acid	23	Polyamides	80
Butadiene	24	Polybutadiene Rubber	82
<i>n</i> -Butanol	26	Polybutylene Terephthalate	83
Calcium Carbide	27	Polycarbonates	84
Caprolactam	28	Polychloroprene Rubber	85
Carbon Black	29	Polyester Resins	86
Carbon Dioxide	30	Polyethylene	87
Carbon Disulphide	31	Polyisobutene	89
Carbon Fibres	32	Polyisoprene Rubber	90
Carbon Tetrachloride	33	Polypropylene	91
Carboxymethylcellulose	34	Polystyrene	93
Chlorine	35	Polyvinyl Acetate	95
Citric Acid	37	Polyvinyl Alcohol	96
Cumene	38	Polyvinyl Chloride	98
Cyclohexane	39	Potassium Sulphate	100
Cyclohexylamine	40	Propionic Acid	101
Dimethyl Terephthalate	41	Propylene	102
Epichlorohydrin	42	Propylene Glycol	103
Ethanol	43	Propylene Oxide	104
Ethanolamines	45	Sodium Carbonate	105
Ethylene	46	Sodium Chlorate	106
Ethylene Dichloride	48	Sodium Cyanide	107
Ethylene Glycol	49	Sodium Hydroxide	108
Ethylene Oxide	50	Sodium Tripolyphosphate	110
Ethylene-Propylene Rubber	51	Sorbitol	111
Ethylene-Vinyl Acetate		Styrene	112
Copolymers	52	Styrene-Butadiene Rubber	114
2-Ethylhexanol	53	Sulphuric Acid	116
Fatty Acids	54	Terephthalic Acid	118
Formaldehyde	55	Titanium Dioxide	119
Formic Acid	56	Toluene	120
Glycerol	57	Trichloroethylene	122
Hydrofluoric Acid	58	Urea	123
Hydrogen Peroxide	59	Vinyl Acetate	125
Isocyanates	60	Vinyl Chloride	126
Isopropanol	62	Xylenes	128

TABLE OF CONTENTS

		Page
Section 1 :	Chemical Product Profiles	7
	These consist of 17 inorganic chemicals, 57 organic chemicals, 6 fertilizers and 23 polymers arranged alphabetically under product headings, listed and indexed on Divider Card 1. Information comprises product description, with the French, German, Italian and Spanish translation of the product name; market trends in production, imports and exports; trade breakdowns for imports and exports for 1979 and 1980; plant data stating plant locations and, where available, actual and planned capacities for each major chemical producer, and any details on processes, feedstocks, licensors and contractors. A map indicating plant locations and major neighbouring cities is included for every product.	
Section 2 :	Company Information.....	131
	235 companies named in Section 1 are alphabetically arranged: Divider Card 2 carries an index. Information comprises company address and, where available, directorate, details of history and present-day structure, number of employees, financial details, domestic and foreign subsidiaries, details of ownership, manufacturing activities etc.	
	List of Companies and their Products surveyed in this volume.....	193

Note: the following abbreviations are used in Section 1.

P = Process F = Feedstock L = Licensor C = Contractor

— = None . . . = No details stated/Not available

*Estimated figure

ABS Resins

Empirical formula: No simple formula

Synonyms: Acrylonitrile-Butadiene-Styrene resins.

Translation: French — Resinas ABS; German — ABS Kunstharze; Italian — Resina ABS; Spanish — Resinas ABS.

Description: The commercial resins are usually:— 1) a mixture of styrene - acrylonitrile copolymer with acrylonitrile butadiene rubber. 2) a terpolymer of styrene, butadiene, and acrylonitrile. ABS resins offer a good balance of impact, tensile strength, hardness and modulus of elasticity in the range 40° to 107°C. They are non-staining and have a high gloss, high chemical resistance, and low specific gravity.

Derivation: Can be made by mechanical or latex blending of styrene-acrylonitrile resins with butadiene acrylonitrile rubbers or with graft polymer rubbers. Also by polymerisation of basic resins to form homogenous resins.

Grades: Over 70 grades available, including self-extinguishing, cold-forming, antistatic expandable, glass-reinforced, electroplating, low-gloss, and high blend grades.

Uses: The largest markets are for plastic pipe and fittings, automotive applications, large home appliances. Other uses include telephones, shoe heels, luggage, etc.

MARKET TRENDS

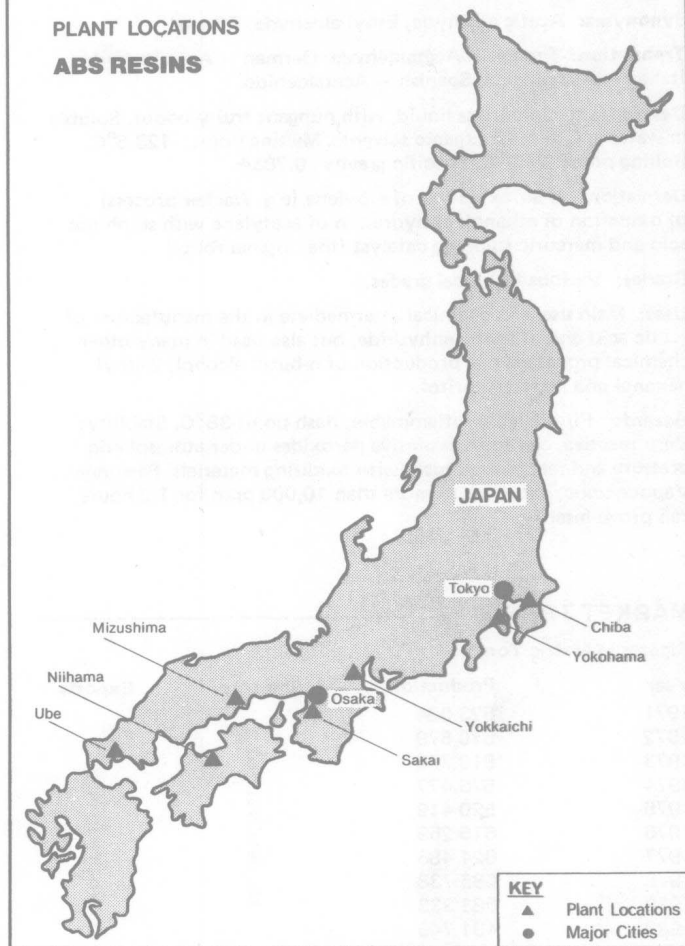
Figures in Metric Tons

Year	Production	Imports	Exports
1971	153 374	—	16 549
1972	222 096	—	36 474
1973	247 476	—	24 760
1974	196 482	—	27 428
1975	164 925	—	29 462
1976	231 840	—	39 124
1977	228 842	—	40 620
1978	266 198	—	50 464
1979	353 013	—	38 374
1980	260 000	—	36 770

Exports: blocks, granules and other solid primary forms.

PLANT LOCATIONS

ABS RESINS



CHEMICAL PLANT DATA

Company	Plant Location	Capacity Metric tons/yr.		Remarks
		Present	Planned	
Asahi-Dow Limited	Mizushima	24 000		F — butadiene, styrene, acrylonitrile; L — Asahi/Dow.
Daicel Chemical Industries Ltd	Sakai	19 000		Capacity for ABS and SAN resins. P — suspension polymerization; F — butadiene, styrene, acrylonitrile; L — Daicel.
Denki Kagaku Kogyo KK	Chiba	21 600		F — butadiene, styrene, acrylonitrile.
Japan Synthetic Rubber Co Ltd	Yokkaichi	60 000		Also 10 000 tpa AES resin. F — butadiene, styrene, acrylonitrile; L — JSR.
Mitsubishi Monsanto Chemical Company	Yokkaichi	42 000		Capacity for ABS resins, also 18 000 tpa SAN resins.
Mitsubishi Rayon Co Ltd	Yokohama	38 400		F — butadiene, styrene, acrylonitrile; L — Monsanto.
Sumitomo Naugatuck Co Ltd	Niihama	30 000		F — butadiene, styrene, acrylonitrile; L — Mitsubishi Rayon.
Toray Industries Inc	Chiba	32 000		F — butadiene, styrene, acrylonitrile; L — Uniroyal.
Ube Cycon Ltd	Ube	6 000		P — mass polymerization; F — butadiene, styrene, acrylonitrile; L — Firestone/Toray.
				F — butadiene, styrene, acrylonitrile; L — Borg-Warner.

TRADE BREAKDOWN

Figures in Metric Tons

Imports	1979	%	1980	%	Exports to	1979	%	1980	%
No details stated					Australia	2 404	6		
					China	1 220	3	1 279	3
					Hong Kong	8 050	21	7 037	19
					Indonesia			1 258	3
					Malaysia	1 066	3	1 141	3
					Singapore	4 914	13	4 605	13
					South Korea	3 721	10	2 867	8
					Spain	1 225	3		
					Taiwan	9 594	25	10 690	29
					Thailand	1 386	4	968	3
					USSR			1 749	5
					Others	4 794	12	5 176	14

Acetaldehyde

Empirical formula: CH₃CHO

Synonyms: Acetic aldehyde, Ethyl aldehyde, Ethanal

Translation: French — Acétaldéhyde; German — Acetaldehyd;
Italian — Acetaldeide; Spanish — Acetaldehido.

Description: Colourless liquid, with pungent fruity odour. Soluble in water and in most organic solvents. Melting point: -123.5°C. Boiling point: 20.2°C. Specific gravity: 0.7834.

Derivation: a) air oxidation of ethylene (e.g. Wacker process)
b) oxidation of ethanol. c) hydration of acetylene with sulphuric acid and mercuric sulphate catalyst (the original route).

Grades: Various technical grades.

Uses: Main use is as chemical intermediate in the manufacture of acetic acid and of acetic anhydride, but also used in many other chemical processes, e.g. production of n-butyl alcohol, 2-ethyl hexanol and pentaerythritol.

Hazards: Fire: Highly inflammable, flash point-38°C. Stability: Very reactive, can form explosive peroxides under atmospheric pressure and reacts vigorously with oxidising materials. Personnel: Vapour toxic, exposure to more than 10,000 ppm for 1-2 hours can prove fatal.

MARKET TRENDS

Figures in Metric Tons

Year	Production	Imports	Exports
1971	523 024	No details stated	No details stated
1972	570 579		
1973	610 778		
1974	576 477		
1975	520 419		
1976	615 259		
1977	624 486		
1978	586 738		
1979	583 333		
1980	431 746		



CHEMICAL PLANT DATA

Company	Plant Location	Capacity		Remarks
		Metric tons/yr. Present	Planned	
Denki Kagaku Kogyo KK	Chiba	60 000		P — oxidation; F — ethylene; L — Aldehyd; C — JGC.
Japan Aldehyde Co Ltd	Chiba	130 000		P — oxidation; F — ethylene; L — Aldehyd.
Kyowa Yuka Co Ltd	Yokkaichi	125 000		P — oxidation; F — ethylene; L — Aldehyd.
Mitsubishi Chemical Industries Ltd	Mizushima	120 000		P — oxidation; F — ethylene; L — Aldehyd.
Mitsui Petrochemical Industries Ltd	Iwakuni-Ohtake	54 000		Estimated capacity. P — oxidation; F — ethylene; L — Aldehyd.
Showa Acetyl Chemicals Co Ltd	Ohita	100 000		P — oxidation; F — ethylene.
Tokuyama Petrochemical Co Ltd	Shin Nanyo	100 000		Estimated capacity. P — oxidation; F — ethylene; L — Aldehyd.

TRADE BREAKDOWN

Figures in Metric Tons

Imports	1979	%	1980	%	Exports	1979	%	1980	%
No details stated					No details stated				

Acetic Acid

Empirical formula: CH_3COOH

Synonyms: Ethanoic acid, Methane carboxylic acid

Translation: French — Acide acétique; German — Essigsäure; Italian — Acido acetico; Spanish — Acido acético.

Description: Clear colourless liquid with a very pungent odour. Miscible with water, alcohol, glycerine and ether. Melting point: 16.1°C . Boiling point: 118.1°C . Specific gravity: 1.04.

Derivation: (a) From catalytic combination of methanol and carbon monoxide. (b) From oxidation of acetaldehyde in air at $70\text{--}80^\circ\text{C}$ in the presence of manganous acetate. There are certain modifications of this process. The acetaldehyde is obtained industrially from ethylene oxidation (e.g. Wacker process), by oxidation of ethanol or by hydration of acetylene. (c) Liquid and vapour-phase catalytic oxidation of butane and other light hydrocarbons.

Grades: The pure acid (minimum 99.8%) is often referred to as glacial acetic acid. There are also many commercial and technical grades with lower acetic acid contents.

Uses: In the manufacture of vinyl acetate and acetic anhydride as well as acetate esters such as ethyl and butyl acetates. Much of the acetic anhydride is used in the production of cellulose acetate.

Hazards: Fire: Combustible liquid, flash point 43.3°C . Stability: Reacts vigorously with oxidising materials and violently with caustic potash and caustic soda. Compatibility: Highly corrosive to metals. Personnel: Vapour causes irritation of eyes and respiratory system. Liquid causes severe burning of skin.

MARKET TRENDS

Figures in Metric Tons

Year	Production	Imports	Exports
1971	428 938	1	26 619
1972	474 032	6	30 910
1973	526 494	3	20 933
1974	508 840	4 045	12 943
1975	443 222	9	18 802
1976	550 439	<1	45 717
1977	543 773	<1	42 827
1978	517 968	3	46 452
1979	502 149	5 107	24 655
1980	417 626	16	16 280

Production: synthetic 99%,
Trade: acetic acid and salts.

PLANT LOCATIONS ACETIC ACID



CHEMICAL PLANT DATA

Company	Plant Location	Capacity Metric tons/yr.		Remarks
		Present	Planned	
Chisso Petrochemical Corporation	Goi	30 000		P — oxidation; F — acetaldehyde.
Daicel Chemical Industries Ltd	Ohtake	40 000		By-product of glycerol manufacture. F — peracetic acid, propylene oxide.
Denki Kagaku Kogyo K K	Ohtake	15 000		P — oxidation; F — naphtha; L — BP; C — Lummus.
	Chiba	60 000		P — oxidation; F — acetaldehyde from ethylene.
Kyodo Sakusan Co Ltd	Aboshi	225 000		Recent expansion from 150 000 tpa. P — carbonylation; F — methanol, carbon monoxide; L — Monsanto.
Kyowa Yuka Co Ltd	Yokkaichi	75 000		P — oxidation; F — acetaldehyde from ethylene.
The Nippon Synthetic Chemical Industry Co Ltd	Mizushima	144 000		P — oxidation; F — acetaldehyde.
	Mizushima		200 000	Plant planned to start in 1983. Will replace present plant. P — carbonylation; F — methanol, carbon monoxide; L — Monsanto.
Showa Acetyl Chemicals Co Ltd	Ohita	130 000		P — oxidation; F — acetaldehyde.
Tokuyama Petrochemical Co Ltd	Shin Nanyo	60 000		Estimated capacity. P — oxidation; F — acetaldehyde from et ethylene.

Continued —

TRADE BREAKDOWN

Figures in Metric Tons

Imports from	1979	%	1980	%
China	51	1		
Taiwan			13	81
USA	5 056	99	3	19
Others			<1	—

Exports to	1979	%	1980	%
Australia	114	—	686	4
China	6 779	27		
Hong Kong			194	1
Indonesia	1 014	4	84	1
Philippines	1 886	8	1 298	8
Singapore	591	2	2 027	12
South Korea	670	3	7 861	48
Taiwan	6 845	28	3 050	19
Thailand	1 639	7	316	2
USA	4 467	18		
Vietnam			400	2
Others	652	3	376	2

Acetic Anhydride

Empirical formula: (CH₃CO)₂O

Synonyms: Acetyl oxide, ethanoic anhydride

Translation: French — Anhydride acétique; German — Essigsäureanhydrid; Italian — Anidride acetica; Spanish — Anhidrido acético.

Description: The anhydride is a colourless liquid with an acrid odour. It reacts with water to form acetic acid, but is miscible with alcohol, ether and acetic acid. Melting point: -73°C; Boiling point: 140°C; Specific gravity: 1.082.

Derivation: Acetic anhydride is derived either by reaction of acetic acid and ketene (from acetic acid cracking) or by direct catalytic oxidation of acetaldehyde. A recently developed method (Tennessee Eastman) uses methanol and acetic acid as starting materials, whereby acetic anhydride is formed by carbonylation of methyl acetate with carbon monoxide.

Uses: The major use for acetic anhydride is in production of cellulose acetate by reaction with cellulose. It is also used in the manufacture of aspirin and other pharmaceuticals, and as an esterifying agent for starch.

Hazards: Fire: acetic anhydride is a flammable liquid; flash point: 54°C. It can react rapidly with water and some alkalis. The vapour causes irritation to the eyes and respiratory system, while the liquid may cause severe burns.

MARKET TRENDS

Figures in Metric Tons

Year	Production	Imports	Exports
1971	96 220*	No details stated	No details stated
1972	103 721		
1973	110 002		
1974	116 084		
1975	102 164		
1976	110 723		
1977	119 833		
1978	116 366		
1979	114 112		
1980	150 491		



CHEMICAL PLANT DATA

Company	Plant Location	Capacity Metric tons/yr.		Remarks
		Present	Planned	
Chisso Corporation	Minamata	3 000		F — acetic acid.
	Morioka	10 000		F — acetic acid.
Daicel Chemical Industries Ltd	Aboshi	120 000		P — ketene route; F — acetic acid, ketene.
The Nippon Synthetic Chemical Industry Co Ltd	Ogaki	3 600		P — ketene route; F — Acetic acid, ketene.
Teijin Ltd	Matsuyama			

TRADE BREAKDOWN

Figures in Metric Tons

Imports	1979	%	1980	%	Exports	1979	%	1980	%
No details stated					No details stated				

Acetone

Empirical formula: CH₃COCH₃

Synonyms: Dimethyl ketone, 2-propanone

Translation: French — Acétone; German — Aceton; Italian — Acetone; Spanish — Acetona.

Description: Colourless volatile and highly inflammable liquid with a characteristic odour. Miscible with water and most organic solvents. Melting point: -95°C. Boiling point: 56.5°C. Specific gravity: 0.792.

Derivation: From a) catalytic oxidation of isopropyl alcohol, b) oxidation of cumene, c) vapour-phase oxidation of butane.

Grades: Pure and various commercial and technical grades.

Uses: As an intermediate for many chemical processes, e.g. in the manufacture of methyl isobutyl ketone, methyl methacrylate, Bis-phenol A and other chemicals. Also as a solvent for lacquers, cellulose acetate, vinyl resins, acetylene, gums, chlorophyll etc. Much used as a solvent in the plastics and paint industries.

Hazards: Fire: Highly inflammable liquid, flash point - 9.4°C. If water is used in fire-fighting, large quantities must be applied to prevent re-ignition; a 4% acetone/96% water solution has a flash point as low as 54°C. Compatibility: Will dissolve rubber and many plastics. Personnel: Vapour toxic.

MARKET TRENDS

Figures in Metric Tons

Year	Production	Imports	Exports
1971	212 846	2	28 919
1972	204 078	17 730	8 151
1973	223 442	23 156	6 767
1974	225 501	13 445	5 730
1975	169 651	8 189	7 284
1976	233 271	18 648	6 642
1977	238 090	12 272	11 824
1978	260 805	11 065	18 675
1979	254 490	30 493	12 730
1980	234 585	27 187	12 795

Production: synthetic.

CHEMICAL PLANT DATA

Company	Plant Location	Capacity Metric tons/yr.		Remarks
		Present	Planned	
Kyowa Yuka Co Ltd	Yokkaichi	36 000		P — direct oxidation; F — isopropanol; L — Aldehyd.
Mitsubishi Chemical Industries Ltd	Mizushima	55 000		P — direct oxidation; F — isopropanol; L — Aldehyd; C — Uhde.
Mitsui Petrochemical Industries Ltd	Chiba	90 000		Estimated capacity. P — oxidation; F — cumene; C — Mitsui.
	Iwakuni-Ohtake	36 000		Estimated capacity. P — oxidation; F — cumene; L — BP; C — Stone & Webster.
Mitsui Toatsu Chemicals Inc	Osaka	60 000		Estimated capacity. P — oxidation; F — cumene; L — BP.
Nippon Petrochemicals Co Ltd	Kawasaki	26 000		P — oxidation; F — cumene, isopropanol.
Sumitomo Chemical Co Ltd	Ohita	12 000		P — oxidation; F — cymene.

TRADE BREAKDOWN

Figures in Metric Tons

Imports from	1979	%	1980	%	Exports to	1979	%	1980	%
China	6	—	3 445	13	Australia	1 491	12	2 553	20
Germany, FR	2	—			China	559	4		
USA	30 485	100	23 741	87	Cuba	59	—		
					Hong Kong	210	2	200	2
					Indonesia			203	2
					North Korea	180	1	260	2
					Philippines	788	6	431	3
					Singapore			898	7
					South Korea	6 185	49	2 828	22
					Taiwan	2 836	22	4 473	35
					Thailand	399	3	575	4
					Others	23	—	374	3
Others			1	—					



Acrylic Esters

Empirical formulae: $\text{CH}_2=\text{CH COOCH}_3$ (methyl acrylate), $\text{CH}_2=\text{CHCOOC}_2\text{H}_5$ (ethyl acrylate), $\text{CH}_2=\text{CHCOOC}_4\text{H}_9$ (*n*-butyl acrylate).

Synonyms: Acrylic monomers

Translation: French — Esters acryliques; German — Acrylester; Italian — Esteri dello acido acrilico; Spanish — Esteres acrilicos.

Description: The three main esters in this group are colourless liquids with acrid odours, immiscible with water, and may polymerize explosively. Boiling points: (methyl acrylate) 80°C; (ethyl acrylate) 100°C; (*n*-butyl acrylate) 145°C.

Derivation: In general, the esters may be prepared from acrylic acid by esterification with alcohols. Acrylic acid itself may be prepared by oxidation of propylene. A specific method for preparation of methyl acrylate involves the reaction of sulphuric acid and methanol with ethylene cyanohydrin; while ethyl acrylate can be prepared from ethylene cyanohydrin, ethanol and sulphuric acid.

Uses: Acrylic esters are used primarily as monomers for formation of acrylic resins, acrylate-methacrylate copolymers, paints and lacquer resins.

Hazards: All three esters are highly flammable, flash point: (methyl acrylate) -2.8°C; (ethyl acrylate) 16°C. The esters, in particular methyl acrylate, are strongly irritating to the eyes and respiratory system.

MARKET TRENDS

Figures in Metric Tons

Year	Production	Imports	Exports
1971	53 656*	No details stated	.
1972	64 628		.
1973	70 114		6 000
1974	63 195		12 000
1975	66 184		20 000*
1976	93 968		.
1977	97 721		18 100
1978	108 798		20 333
1979	126 248		20 000
1980	116 035		.

Production: acrylic acid ester.

PLANT LOCATIONS ACRYLIC ESTERS



CHEMICAL PLANT DATA

Company	Plant Location	Capacity Metric tons/yr.		Remarks
		Present	Planned	
Asahi Chemical Industry Co Ltd	Kawasaki	10 000		Estimated capacity for methyl acrylate. P — direct oxidation; F — propylene; L — BP.
DIA Acrylate Co Ltd	Yokkaichi			Production of methyl, ethyl, butyl, and 2-ethylhexyl acrylates.
Mitsubishi Petrochemical Co Ltd	Yokkaichi	20 500		Capacity for acrylic esters. P — direct oxidation; F — propylene; L — Mitsubishi Petrochem; C — JGC.
Nippon Shokubai Kagaku Kogyo Co Ltd	Himeji	45 000		Capacity for acrylic acid. Esters capacity is 60 000 tpa. P — direct oxidation; F — propylene; L — Nippon Shokubai; C — Nippon Shokubai.
Nissho Kayaku Co Ltd	Ohita	21 000		Capacity for acrylic esters, acrylic acid and acrolein. P — direct oxidation; F — propylene; L — Nippon Kayaku; C — JGC.
Osaka Organic Chemical Industry Co Ltd	Kashiwara	3 000		Estimated capacity for acrylic acid and esters.
Sumitomo Chemical Co Ltd	Niihama	32 000		Capacity for acrylic acid.
Toagosei Chemical Industry Co Ltd	Nagoya	60 000		Capacity for acrylic esters.

TRADE BREAKDOWN

Figures in Metric Tons

Imports	1979	%	1980	%	Exports	1979	%	1980	%
No details stated					No details stated				