

GAINS IN CHEMICAL OUTPUT CONTINUE

PRODUCTION growth in European countries was better than that in other major nations

PRODUCTION GREW among the major chemical-producing countries in 2006, as worldwide economies maintained their increases of the past several years.

The European Chemical Industry Council (CEFIC), which follows the European region as a whole rather than individual countries, notes that chemical production, excluding pharmaceuticals, grew by 1.9% in the region. This was better than growth that occurred in 2005 and above the long-term average, the trade association says.

CEFIC notes that the performance of the chemical industry, excluding drugs, is particularly gratifying, because the inclusion of pharmaceuticals tends to skew the results. In 2006, pharmaceutical output grew 7.1%.

If there was a surprise, it was that many

and the U.K., 1.3%. Production in France was unchanged from 2005.

In the U.S., total chemical output rose 2.1%, according to Federal Reserve Board indexes. This number trailed the percentage increases for all manufacturing, which rose 5.0% in 2006, and for nondurable manufacturing, which was up 2.2%.

Among the chemical sectors, basic inorganic chemicals showed the best growth, rising 4.1%. This is well ahead of the sector's 10-year average annual growth of just 0.8%. Within this sector, output of synthetic dyes and pigments jumped 13.8%.

Production of the other

basic category, organic chemicals, grew just 1.6%. This sector's major chemical industry customer, synthetic materials, produced just 0.5% more in 2006 than in the prior year, with plastic materials and resins up 1.8%, and artificial and synthetic fibers down 10.2%.

For both basic inorganics and organics in the U.S., comparisons with 2005 results are somewhat skewed by the effects of the 2005 Gulf Coast hurricanes, which caused production declines in that year for both sectors.

Perhaps the surprise in the U.S. chemical industry in 2006 compared with the prior year was a 0.3% decline in the production index for pharmaceuticals and medicines. As modest as the decrease was, government data indicate this is the first time since 1975 that this sector has contracted.

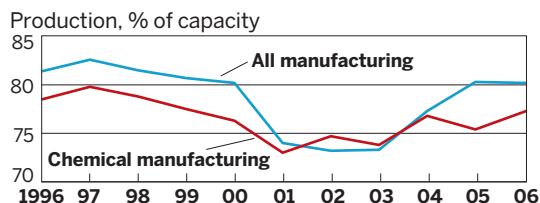
Canada is another country where chemicals outperformed pharmaceuticals. In Canada, total chemical production grew by 1.3% from 2005, according to data

provided by Statistics Canada. Among the sectors, basic chemicals increased its output by 3.2%, which was greater than the 2.9% growth in production of pharmaceuticals and medicines.

In Asia, Japan's chemical production index in 2006 fell 0.8% from the previous year, according to data from the Ministry of Trade, Economy & Industry. All of the indexes for that country's chemical output were lower than in the year before. Organic chemicals were down 3.3%; cyclic intermediates and dyes, 3.1%; sodium chemicals, 2.6%; fertilizers, 2.3%; petrochemicals, 2.1%; industrial inorganic chemicals and dyes, 1.3%; synthetic rubber,

U.S. PLANT USE

In 2006, chemical capacity use recovered from the effects of 2005 hurricanes

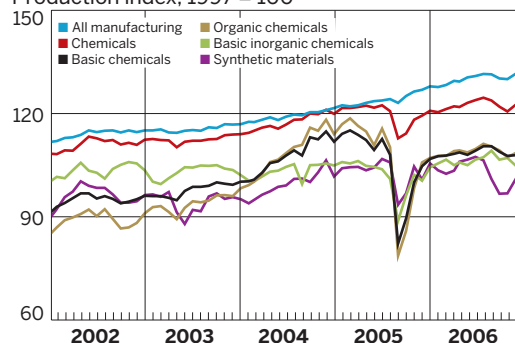


NOTE: As of December. SOURCE: Federal Reserve Board

U.S. PRODUCTION

Output rose for all but synthetic materials

Production index, 1997 = 100



NOTE: Seasonally adjusted. SOURCE: Federal Reserve Board

European countries saw production increases rising more than those of most of the other major producing nations. Among seven major European chemical-producing countries, the Netherlands and Spain showed the strongest growth, with output, including pharmaceuticals, rising 6.5%. They were followed by Germany, with a 4.3% increase; Belgium, 3.5%; Italy, 2.2%;

1.2%; plastics, 0.5%; and aromatics, 0.1%.

Meanwhile, in South Korea, total chemical production was up 3.5%, while output of rubber and plastic products increased 5.4%, data from the Korea National Statistical Office show. Ethylene production, which sports a 10-year average annual growth of 4.3%, stagnated.

Taiwan's production measures, as reported by the Ministry of Economic Affairs, were mixed. Output of all chemicals declined 2.0%, but production of basic chemicals soared 17.0%. The next best growth was for synthetic rubber, increasing by 4.0%. Also improving were plastics and resins, up 1.1%, and fertilizers, up 1.3%. Output of petrochemicals fell 0.1%, while production of man-made fibers, which has declined for the past two years, dropped 4.3%. Since 2004, output of man-made fibers has fallen 14.9%.

As usual, China released few numbers to the public on a timely basis, but the numbers it supplied for organic chemicals were strong. Production of ethylene, the country's largest volume chemical, was up 16.0%. Refined methanol jumped 42.3%, caprolactam rose 36.0%, and benzene increased 12.4%.

PRODUCTION

U.S. PRODUCTION INDEX

Twelve of 15 major chemical categories increased output

| PRODUCTION INDEX, 1997 = 100 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 1996-06 |
| Total index | 93.3 | 100.0 | 106.1 | 111.1 | 116.1 | 112.1 | 112.1 | 113.3 | 116.1 | 119.9 | 124.7 | 4.0% | 2.9% |
| All manufacturing | 92.2 | 100.0 | 106.9 | 112.9 | 118.5 | 113.7 | 114.0 | 115.4 | 118.9 | 123.7 | 129.9 | 5.0 | 3.5 |
| Nondurable manufacturing | 96.4 | 100.0 | 101.5 | 102.2 | 102.8 | 99.4 | 100.4 | 100.6 | 102.5 | 104.9 | 107.2 | 2.2 | 1.1 |
| Chemicals | 94.4 | 100.0 | 101.7 | 103.7 | 105.3 | 103.4 | 110.8 | 112.4 | 117.1 | 119.7 | 122.2 | 2.1 | 2.6 |
| Basic chemicals | 93.0 | 100.0 | 96.6 | 101.4 | 97.9 | 88.1 | 94.8 | 97.6 | 106.8 | 106.1 | 108.5 | 2.2 | 1.6 |
| Basic inorganic chemicals | 98.0 | 100.0 | 104.1 | 105.8 | 98.3 | 94.2 | 103.3 | 103.2 | 103.0 | 102.0 | 106.2 | 4.1 | 0.8 |
| Alkalies & chlorine | 109.3 | 100.0 | 98.8 | 129.0 | 119.2 | 100.3 | 159.7 | 150.3 | 173.9 | 181.4 | 181.0 | -0.2 | 5.2 |
| Synthetic dyes & pigments | 95.5 | 100.0 | 98.7 | 95.3 | 98.2 | 91.1 | 103.8 | 103.1 | 98.0 | 102.4 | 116.6 | 13.8 | 2.0 |
| Other basic inorganic chemicals | 96.6 | 100.0 | 104.1 | 109.8 | 99.8 | 95.5 | 101.5 | 98.8 | 100.2 | 98.3 | 100.5 | 2.3 | 0.4 |
| Organic chemicals | 89.9 | 100.0 | 91.5 | 98.4 | 97.2 | 83.9 | 88.9 | 93.5 | 107.6 | 107.2 | 108.8 | 1.6 | 1.9 |
| Synthetic materials (a) | 94.1 | 100.0 | 104.3 | 105.2 | 103.3 | 93.2 | 95.9 | 94.3 | 98.9 | 102.6 | 103.1 | 0.5 | 0.9 |
| Plastic materials & resins | 90.8 | 100.0 | 108.2 | 112.3 | 111.4 | 101.1 | 106.5 | 102.6 | 110.3 | 115.2 | 117.3 | 1.8 | 2.6 |
| Artificial & synthetic fibers | 105.8 | 100.0 | 100.6 | 90.8 | 84.7 | 78.7 | 69.8 | 73.1 | 70.3 | 72.0 | 64.7 | -10.2 | -4.8 |
| Chemical products | 94.7 | 100.0 | 105.0 | 106.5 | 110.4 | 116.2 | 127.0 | 129.0 | 133.0 | 137.6 | 140.3 | 1.9 | 4.0 |
| Pharmaceuticals & medicines | 94.9 | 100.0 | 108.8 | 113.1 | 117.6 | 126.6 | 136.6 | 141.3 | 142.1 | 144.7 | 144.3 | -0.3 | 4.3 |
| Soap, cleaning compounds & toiletries | 94.5 | 100.0 | 98.5 | 94.6 | 97.6 | 99.3 | 113.0 | 108.8 | 121.8 | 131.9 | 143.5 | 8.8 | 4.3 |
| Paint & coatings | 99.3 | 100.0 | 100.2 | 98.3 | 98.0 | 95.8 | 96.0 | 94.8 | 100.5 | 101.0 | 104.0 | 3.1 | 0.5 |
| Pesticides, fertilizers & other agricultural chemicals | 96.4 | 100.0 | 102.1 | 92.0 | 86.9 | 79.9 | 82.7 | 86.4 | 90.7 | 95.6 | 96.4 | 0.8 | 0.0 |

a Includes synthetic rubber. SOURCE: Federal Reserve Board

CANADA PRODUCTION INDEX

Chemicals outperformed all Canadian manufacturing

| PRODUCTION INDEX, 1997 = 100 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | |
|---------------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 1996-06 |
| All manufacturing | 93.9 | 100.0 | 105.0 | 113.5 | 126.2 | 120.0 | 121.0 | 120.5 | 123.0 | 124.1 | 123.0 | -0.9% | 2.7% |
| Chemicals | 99.8 | 100.0 | 100.9 | 105.1 | 116.8 | 119.5 | 124.7 | 129.5 | 135.4 | 136.6 | 138.4 | 1.3 | 3.3 |
| Basic chemicals | 93.0 | 100.0 | 98.2 | 97.8 | 112.5 | 112.4 | 111.1 | 113.1 | 121.9 | 123.2 | 127.1 | 3.2 | 3.2 |
| Pharmaceuticals & medicines | 96.6 | 100.0 | 95.3 | 111.2 | 133.8 | 174.4 | 199.5 | 207.6 | 202.0 | 197.4 | 203.1 | 2.9 | 7.7 |

SOURCE: Statistics Canada

EUROPE PRODUCTION INDEX

The Netherlands and Spain showed strong growth

| CHEMICAL PRODUCTION INDEX, 1997 = 100 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | |
|--|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 1996-06 |
| Belgium | 90.2 | 100.0 | 101.2 | 108.1 | 119.9 | 116.5 | 127.2 | 127.0 | 131.3 | 135.0 | 139.7 | 3.5% | 4.5% |
| France | 96.2 | 100.0 | 105.1 | 107.5 | 112.5 | 109.9 | 108.7 | 107.5 | 108.1 | 109.9 | 109.9 | 0.0 | 1.3 |
| Germany | 94.4 | 100.0 | 100.2 | 104.5 | 107.5 | 104.9 | 107.5 | 107.5 | 109.0 | 113.4 | 118.3 | 4.3 | 2.3 |
| Italy | 96.6 | 100.0 | 100.2 | 100.4 | 101.8 | 99.2 | 100.5 | 104.9 | 107.1 | 108.4 | 110.8 | 2.2 | 1.4 |
| Netherlands | 95.6 | 100.0 | 100.0 | 107.0 | 116.0 | 117.0 | 124.0 | 124.0 | 124.0 | 126.1 | 134.3 | 6.5 | 3.5 |
| Spain | 93.5 | 100.0 | 103.6 | 107.7 | 106.2 | 107.1 | 110.3 | 113.5 | 116.1 | 119.0 | 126.7 | 6.5 | 3.1 |
| U.K. | 98.2 | 100.0 | 101.6 | 104.9 | 109.3 | 113.2 | 112.3 | 112.9 | 117.8 | 118.6 | 120.1 | 1.3 | 2.0 |

SOURCES: European Chemistry Industry Council, national associations

ASIA PRODUCTION INDEX

Chemicals trailed manufacturing in Japan and Taiwan

| PRODUCTION INDEX, 1997 = 100 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 1996-06 |
| JAPAN | | | | | | | | | | | | | |
| Mining & manufacturing | 96.5 | 100.0 | 92.9 | 93.6 | 99.1 | 94.1 | 90.1 | 93.0 | 98.1 | 99.2 | 104.0 | 4.8% | 0.8% |
| All chemicals (a) | 95.7 | 100.0 | 94.9 | 98.3 | 98.9 | 95.8 | 95.8 | 97.3 | 98.7 | 99.3 | 98.5 | -0.8 | 0.3 |
| Petrochemicals | 94.5 | 100.0 | 94.5 | 99.3 | 99.1 | 94.5 | 95.5 | 98.4 | 101.0 | 102.0 | 99.9 | -2.1 | 0.5 |
| Aromatics | 85.5 | 100.0 | 93.9 | 100.9 | 100.1 | 97.7 | 100.8 | 106.5 | 109.9 | 115.0 | 114.9 | -0.1 | 3.0 |
| Industrial sodium chemicals | 95.7 | 100.0 | 95.7 | 97.2 | 98.2 | 91.0 | 92.6 | 93.8 | 93.8 | 94.6 | 92.1 | -2.6 | -0.4 |
| Inorganic chemicals & dyes | 96.8 | 100.0 | 97.7 | 103.3 | 106.8 | 101.8 | 103.9 | 106.3 | 108.8 | 110.1 | 108.7 | -1.3 | 1.2 |
| Organic chemicals | 93.2 | 100.0 | 96.6 | 101.9 | 100.6 | 94.3 | 94.6 | 100.0 | 100.7 | 102.1 | 98.7 | -3.3 | 0.6 |
| Cyclic intermediates & dyes | 96.8 | 100.0 | 95.1 | 98.2 | 97.7 | 93.9 | 95.6 | 96.6 | 98.9 | 96.0 | 93.1 | -3.1 | -0.4 |
| Plastics | 89.8 | 100.0 | 92.2 | 94.8 | 96.4 | 91.0 | 91.0 | 91.4 | 94.3 | 94.3 | 93.8 | -0.5 | 0.4 |
| Synthetic rubber | 95.5 | 100.0 | 95.5 | 99.1 | 99.9 | 92.0 | 96.1 | 99.6 | 102.1 | 102.7 | 101.5 | -1.2 | 0.6 |
| Fertilizers | 101.8 | 100.0 | 90.9 | 88.1 | 87.1 | 80.6 | 75.0 | 69.5 | 69.8 | 68.5 | 67.0 | -2.3 | -4.1 |
| SOUTH KOREA | | | | | | | | | | | | | |
| All manufacturing | 95.9 | 100.0 | 93.4 | 116.8 | 136.8 | 137.1 | 148.3 | 156.0 | 172.4 | 183.3 | 202.6 | 10.5% | 7.8% |
| Chemicals & chemical products | 89.0 | 100.0 | 96.6 | 106.6 | 113.0 | 116.0 | 123.4 | 128.1 | 134.5 | 138.6 | 143.5 | 3.5 | 4.9 |
| Rubber & plastic products | 98.1 | 100.0 | 79.2 | 93.1 | 99.4 | 101.9 | 108.5 | 111.3 | 115.0 | 117.3 | 123.7 | 5.4 | 2.3 |
| TAIWAN | | | | | | | | | | | | | |
| All manufacturing | 93.3 | 100.0 | 103.2 | 111.2 | 120.2 | 110.1 | 120.4 | 129.4 | 143.2 | 148.7 | 157.1 | 5.6% | 5.4% |
| Chemicals | 93.8 | 100.0 | 102.9 | 112.6 | 120.5 | 129.4 | 121.9 | 133.4 | 146.8 | 147.9 | 144.9 | -2.0 | 4.4 |
| Basic chemicals | 95.9 | 100.0 | 98.9 | 107.5 | 120.9 | 123.5 | 125.4 | 133.5 | 150.1 | 151.1 | 176.8 | 17.0 | 6.3 |
| Petrochemicals | 95.5 | 100.0 | 101.2 | 118.5 | 133.4 | 163.8 | 175.4 | 197.8 | 213.6 | 228.0 | 227.6 | -0.1 | 9.1 |
| Fertilizers | 96.5 | 100.0 | 92.3 | 85.0 | 83.0 | 77.5 | 74.2 | 73.8 | 71.4 | 76.6 | 77.6 | 1.3 | -2.2 |
| Man-made fibers | 91.1 | 100.0 | 105.5 | 107.6 | 111.8 | 107.7 | 115.1 | 115.0 | 116.8 | 103.9 | 99.4 | -4.3 | 0.9 |
| Plastics & resins | 95.1 | 100.0 | 103.3 | 113.2 | 117.8 | 118.0 | 125.3 | 129.4 | 137.0 | 134.3 | 135.7 | 1.1 | 3.6 |
| Synthetic rubber | 80.3 | 100.0 | 103.3 | 109.0 | 102.4 | 105.5 | 115.8 | 120.9 | 129.1 | 127.7 | 132.8 | 4.0 | 5.2 |

a Excludes pharmaceuticals.

SOURCES: Japan Ministry of Economy, Trade & Industry; Korea National Statistical Office, South Korea; Taiwan Ministry of Economic Affairs, Department of Statistics

U.S. ORGANICS

Ethylene oxide increased nearly 9%, as others grew only modestly or declined

| THOUSANDS OF METRIC TONS UNLESS OTHERWISE NOTED | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 1996-06 |
| Acrylonitrile | 1,530 | 1,493 | 1,415 | 1,415 | 1,551 | 1,343 | 1,239 | 1,501 | 1,598 | 1,323 | 1,358 | 2.6% | -1.2% |
| Aniline | 489 | 607 | 701 | 719 | 846 | 865 | 921 | 969 | 1,034 | 964 | 930 | -3.6 | 6.6 |
| Benzene (thousands of liters) (a,b) | 8,009 | 8,865 | 8,467 | 9,088 | 9,156 | 7,271 | 8,130 | 7,926 | 8,781 | 7,574 | 7,642 | 0.9 | -0.5 |
| 1,3-Butadiene (c) | 1,744 | 1,863 | 1,844 | 1,942 | 2,009 | 1,721 | 1,869 | 1,902 | 2,204 | 2,046 | 1,836 | -10.3 | 0.5 |
| Cumene | 2,667 | 2,776 | 3,045 | 3,162 | 3,741 | 3,187 | 3,503 | 3,397 | 3,736 | 3,509 | 3,559 | 1.4 | 2.9 |
| Ethylbenzene | 4,699 | 5,432 | 5,743 | 5,945 | 5,968 | 4,642 | 5,412 | 5,578 | 5,779 | 5,251 | 5,286 | 0.7 | 1.2 |
| Ethylene | 22,270 | 23,169 | 23,615 | 25,300 | 25,113 | 22,513 | 23,644 | 22,976 | 25,682 | 23,974 | 25,020 | 4.4 | 1.2 |
| Ethylene dichloride | 5,142 | 11,927 | 11,140 | 10,358 | 9,911 | 9,336 | 9,328 | 9,994 | 12,163 | 11,308 | 9,732 | -13.9 | 6.6 |
| Ethylene oxide | 3,284 | 3,738 | 3,692 | 4,030 | 3,867 | 3,343 | 3,447 | 3,660 | 3,772 | 3,166 | 3,445 | 8.8 | 0.5 |
| Propylene (d) | 11,390 | 12,489 | 13,014 | 13,202 | 14,457 | 13,176 | 14,425 | 13,939 | 15,345 | 15,490 | 15,650 | 1.0 | 3.2 |
| Styrene | 5,386 | 5,156 | 5,166 | 5,397 | 5,405 | 4,214 | 4,899 | 5,167 | 5,394 | 5,042 | 4,827 | -4.3 | -1.1 |
| Urea | 7,755 | 7,533 | 8,042 | 8,080 | 6,969 | 6,080 | 7,038 | 5,783 | 5,756 | 5,267 | 5,431 | 3.1 | -3.5 |
| Vinyl acetate | 1,322 | 1,331 | 1,333 | 1,378 | 1,497 | 1,188 | 1,349 | 1,306 | 1,431 | 1,327 | 1,315 | -0.9 | -0.1 |

a Tar distillers and coke-oven operators not included. b Specification grades. c Rubber grade. d All grades.

SOURCES: National Petroleum Refiners Association, Bureau of the Census

PRODUCTION

CANADA ORGANICS

Results were mixed for those products with available data

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 1996-06 |
| Benzene | 758 | 715 | 718 | 805 | 859 | 751 | 849 | 843 | 915 | 798 | 743 | -6.9% | -0.2% |
| Butadiene | 212 | 219 | 236 | 230 | 252 | 245 | 276 | 276 | 289 | 246 | 262 | 6.5 | 2.1 |
| Ethylene | 3,202 | 3,244 | 3,557 | 3,881 | 4,069 | 4,261 | 4,734 | 4,729 | 5,095 | na | na | na | na |
| Formaldehyde | 195 | 210 | 228 | 211 | 194 | 179 | 212 | 245 | 269 | na | 236 | na | 1.9 |
| Propylene | 822 | 859 | 1,038 | 1,000 | 934 | 882 | 956 | 938 | 939 | 737 | 833 | 13.0 | 0.1 |
| Toluene | 303 | 321 | 222 | 260 | 218 | 222 | 256 | 289 | na | na | 253 | na | -1.8 |
| Urea | 3,281 | 3,470 | 3,714 | 3,783 | 3,887 | 3,363 | 3,436 | 3,311 | 3,654 | 3,549 | na | na | na |
| Xylenes | 384 | 362 | 308 | 253 | 312 | 271 | 294 | 336 | 351 | na | na | na | na |

na = not available. SOURCE: Statistics Canada

EUROPE ORGANICS

Production of most organic chemicals declined

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 (a) | ANNUAL CHANGE | |
|--------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 2005-06 |
| Acetic acid | 589 | 781 | 584 | 593 | 754 | 495 | 716 | 676 | 1,451 | 1,500 | 1,050 | -30.0% | |
| Acetone | 992 | 1,173 | 1,254 | 1,307 | 1,325 | 404 | 1,011 | 1,235 | 1,567 | 1,336 | 1,696 | 26.9 | |
| Benzene | 3,617 | 3,561 | 3,345 | 3,705 | 4,565 | 6,670 | 6,817 | 6,535 | 7,931 | 7,089 | 6,050 | -14.7 | |
| Butadiene | 1,906 | 1,939 | 1,971 | 2,027 | 2,097 | 1,992 | 2,024 | 2,131 | 2,222 | 2,233 | 2,182 | -2.3 | |
| 1-Butanol | 140 | 164 | 188 | 44 | 67 | 531 | 575 | 542 | 788 | 816 | 650 | -20.3 | |
| Ethylbenzene | na | 679 | 684 | 937 | 149 | 1,180 | 769 | 911 | 4,262 | 4,276 | 3,730 | -12.8 | |
| Ethylene | 17,748 | 18,537 | 18,980 | 19,362 | 19,444 | 19,674 | 20,159 | 20,686 | 21,408 | 21,600 | 21,192 | -1.9 | |
| Ethylene dichloride | 413 | 902 | 860 | 1,056 | 1,122 | 2,759 | 3,358 | 3,374 | 6,044 | 6,646 | 5,538 | -16.7 | |
| Ethylene glycol | 365 | 506 | 1,171 | 1,177 | 1,195 | 268 | 239 | 857 | 1,404 | 1,637 | 1,495 | -8.7 | |
| Ethylene oxide | 190 | 634 | 644 | 592 | 637 | 934 | 717 | 792 | 2,311 | 2,397 | 2,160 | -9.9 | |
| Formaldehyde | 735 | 808 | 824 | 947 | 954 | 2,463 | 3,299 | 3,295 | 4,017 | 4,057 | 4,174 | 2.9 | |
| Methanol | 1,046 | 2,365 | 2,242 | 869 | 1,148 | 2,030 | 1,844 | 2,009 | 2,878 | 3,248 | 3,165 | -2.6 | |
| Phenol | 951 | na | 1,391 | na | na | 689 | 797 | 724 | 2,059 | 2,005 | 2,216 | 10.5 | |
| Phthalic anhydride | 182 | 414 | 446 | 446 | 488 | 371 | 442 | 430 | 848 | 852 | 691 | -18.9 | |
| Propylene | 12,037 | 12,624 | 12,885 | 13,153 | 13,330 | 13,352 | 14,107 | 14,708 | 15,123 | 15,406 | 15,291 | -0.7 | |
| Propylene glycol | 328 | 361 | 351 | 429 | 443 | 316 | 305 | 329 | 1,987 | 2,179 | 748 | -65.7 | |
| Propylene oxide | 398 | 819 | 727 | 845 | 908 | 735 | 777 | 861 | 666 | 950 | 1,200 | 26.3 | |
| Styrene | na | 3,025 | 3,152 | 2,989 | 3,215 | 958 | 3,078 | 3,215 | 6,220 | 4,963 | 4,660 | -6.1 | |
| Toluene | 1,161 | 209 | 1,130 | 1,172 | 1,155 | 886 | 919 | 848 | 1,913 | 2,014 | 1,570 | -22.0 | |
| Vinyl acetate | na | 391 | 469 | 718 | 644 | 457 | 667 | 502 | 881 | 800 | 850 | 6.3 | |
| Xylenes | 129 | 1,368 | 2,514 | 2,497 | 2,602 | 579 | 1,122 | 626 | 4,382 | 4,282 | 4,127 | -3.6 | |

NOTE: Data from 2002 forward are for 25 countries in the European Union and prior to 2002, for 15 countries. Thus, 10-year comparisons are not meaningful. a C&EN estimates based on partial reporting. na = not available. SOURCES: European Union and national government statistics offices, Association of Petrochemicals Producers in Europe

CHINA ORGANICS

Ethylene production increased by more than 1 million metric tons

| THOUSANDS OF METRIC TONS | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|---------|
| | | | | | | | | | | | 2005-06 | 1997-06 |
| Benzene (pure) | 1,358 | 1,341 | 1,535 | 1,850 | 1,988 | 2,131 | 2,408 | 2,556 | 3,061 | 3,441 | 12.4% | 10.9% |
| Caprolactam | 100 | 120 | 109 | 164 | 152 | 170 | 201 | 228 | 214 | 291 | 36.0 | 12.6 |
| Ethylene | 3,585 | 3,772 | 4,348 | 4,743 | 4,807 | 5,414 | 6,118 | 6,266 | 7,555 | 8,765 | 16.0 | 10.4 |
| Methanol (refined) | 1,743 | 1,581 | 1,794 | 1,967 | 2,065 | 2,110 | 2,989 | 4,406 | 5,356 | 7,623 | 42.3 | 17.8 |

SOURCE: China National Chemical Information Center

ASIA ORGANICS

Production fell sharply for Japanese acrylonitrile, phthalate plasticizers, and phthalic anhydride

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 1996-06 |
| JAPAN | | | | | | | | | | | | | |
| Acetic acid | 599 | 620 | 654 | 644 | 675 | 594 | 569 | 592 | 589 | 599 | 597 | -0.3% | 0.0% |
| Acetone | 417 | 458 | 459 | 507 | 508 | 476 | 472 | 492 | 539 | 546 | 531 | -2.7 | 2.4 |
| Acrylonitrile | 675 | 730 | 667 | 738 | 732 | 738 | 708 | 780 | 711 | 742 | 667 | -10.1 | -0.1 |
| Benzene (a) | 4,177 | 4,502 | 4,203 | 4,459 | 4,425 | 4,261 | 4,313 | 4,551 | 4,758 | 4,980 | 4,874 | -2.1 | 1.6 |
| Butadiene | 1,025 | 1,052 | 977 | 1,035 | 1,044 | 976 | 993 | 1,062 | 1,041 | 1,040 | 1,002 | -3.7 | -0.2 |
| Butanol | 415 | 447 | 424 | 495 | 461 | 472 | 476 | 519 | 506 | 513 | 537 | 4.7 | 2.6 |
| Caprolactam | 555 | 556 | 519 | 581 | 599 | 531 | 508 | 530 | 503 | 458 | 467 | 2.0 | -1.7 |
| Cyclohexane | 639 | 721 | 652 | 688 | 673 | 598 | 607 | 685 | 676 | 722 | 731 | 1.2 | 1.4 |
| Ethylene | 7,138 | 7,416 | 7,076 | 7,687 | 7,614 | 7,361 | 7,152 | 7,367 | 7,570 | 7,618 | 7,522 | -1.3 | 0.5 |
| Ethylene dichloride | 3,116 | 3,491 | 3,491 | 3,503 | 3,431 | 3,275 | 3,352 | 3,463 | 3,594 | 3,687 | 3,514 | -4.7 | 1.2 |
| Ethylene glycol | 751 | 886 | 920 | 922 | 930 | 787 | 733 | 814 | 786 | 841 | 763 | -9.3 | 0.2 |
| Ethylene oxide | 840 | 952 | 953 | 976 | 990 | 891 | 868 | 939 | 941 | 1,005 | 974 | -3.1 | 1.5 |
| Octanol | 331 | 321 | 285 | 315 | 278 | 262 | 302 | 306 | 307 | 279 | 280 | 0.4 | -1.7 |
| Phenol | 768 | 833 | 851 | 888 | 916 | 884 | 891 | 926 | 966 | 938 | 860 | -8.3 | 1.1 |
| Phthalate plasticizers | 484 | 481 | 398 | 417 | 396 | 369 | 377 | 382 | 357 | 315 | 279 | -11.4 | -5.4 |
| Phthalic anhydride | 342 | 330 | 301 | 301 | 290 | 259 | 262 | 262 | 257 | 239 | 175 | -26.8 | -6.5 |
| Polypropylene glycol | 296 | 295 | 274 | 302 | 304 | 294 | 299 | 314 | 346 | 339 | 344 | 1.5 | 1.5 |
| Propylene | 5,143 | 5,409 | 5,101 | 5,520 | 5,453 | 5,342 | 5,309 | 5,610 | 5,767 | 6,030 | 6,090 | 1.0 | 1.7 |
| Purified terephthalic acid | 1,561 | 1,663 | 1,616 | 1,547 | 1,527 | 1,496 | 1,624 | 1,443 | 1,531 | 1,472 | 1,432 | -2.7 | -0.9 |
| Styrene | 3,085 | 3,035 | 2,770 | 3,055 | 2,968 | 3,004 | 3,016 | 3,201 | 3,345 | 3,392 | 3,295 | -2.9 | 0.7 |
| Toluene (a) | 1,370 | 1,419 | 1,349 | 1,488 | 1,489 | 1,423 | 1,548 | 1,584 | 1,634 | 1,676 | 1,633 | -2.6 | 1.8 |
| Toluene diisocyanate | 166 | 192 | 192 | 192 | 214 | 214 | 223 | 230 | 245 | 216 | 232 | 7.4 | 3.4 |
| Xylene (a) | 3,931 | 4,634 | 4,340 | 4,641 | 4,681 | 4,798 | 4,900 | 5,213 | 5,395 | 5,570 | 5,727 | 2.8 | 3.8 |
| p-Xylene | 2,329 | 2,921 | 2,754 | 2,969 | 2,920 | 2,814 | 2,920 | 3,097 | 3,164 | 3,358 | 3,357 | -0.0 | 3.7 |
| SOUTH KOREA | | | | | | | | | | | | | |
| Benzene | 1,407 | 1,819 | 2,412 | 2,572 | 2,834 | 2,650 | 2,852 | 3,246 | 3,462 | 3,594 | 3,719 | 3.5% | 10.3% |
| Butadiene | 601 | 658 | 731 | 764 | 808 | 777 | 816 | 860 | 917 | 939 | 948 | 1.0 | 4.7 |
| Ethylene | 3,968 | 4,450 | 5,110 | 5,216 | 5,439 | 5,398 | 5,636 | 5,872 | 5,945 | 6,058 | 6,055 | -0.1 | 4.3 |
| Propylene | 2,244 | 2,760 | 3,247 | 3,282 | 3,409 | 3,273 | 3,557 | 3,753 | 3,892 | 3,945 | 4,171 | 5.7 | 6.4 |
| Vinyl chloride | 709 | 911 | 984 | 1,017 | 1,133 | 1,392 | 1,416 | 1,441 | 1,498 | 1,501 | 1,521 | 1.3 | 7.9 |
| TAIWAN | | | | | | | | | | | | | |
| Acrylonitrile | 180 | 180 | 167 | 175 | 186 | 292 | 339 | 352 | 379 | 386 | 418 | 8.3% | 8.8% |
| Benzene | 511 | 506 | 415 | 605 | 690 | 1,070 | 931 | 998 | 1,088 | 1,204 | 1,180 | -2.0 | 8.7 |
| Butadiene | 129 | 130 | 122 | 190 | 220 | 349 | 346 | 390 | 412 | 387 | 394 | 1.8 | 11.8 |
| Caprolactam | 104 | 114 | 123 | 119 | 171 | 184 | 186 | 216 | 216 | 247 | 257 | 4.1 | 9.5 |
| Diethyl phthalate | 193 | 274 | 270 | 269 | 198 | 280 | 257 | 243 | 239 | 204 | 211 | 3.4 | 0.9 |
| Ethylene | 906 | 959 | 935 | 1,296 | 1,592 | 2,584 | 2,393 | 2,679 | 2,864 | 2,890 | 2,888 | -0.1 | 12.3 |
| Ethylene glycol | 194 | 193 | 206 | 301 | 612 | 1,036 | 939 | 1,169 | 1,459 | 1,413 | 1,343 | -5.0 | 21.3 |
| Propylene | 514 | 553 | 545 | 765 | 930 | 1,410 | 1,462 | 1,752 | 1,995 | 2,012 | 2,105 | 4.6 | 15.1 |
| Purified terephthalic acid | 2,210 | 2,345 | 2,433 | 2,769 | 3,140 | 3,217 | 3,705 | 4,079 | 4,620 | 4,597 | 4,400 | -4.3 | 7.1 |
| Styrene | 411 | 464 | 386 | 806 | 956 | 1,146 | 1,249 | 1,274 | 1,247 | 1,248 | 1,222 | -2.1 | 11.5 |
| Toluene | 13 | 43 | 23 | 18 | 26 | 54 | 42 | 64 | 140 | 86 | 30 | -65.1 | 8.7 |
| Vinyl chloride | 1,013 | 927 | 1,018 | 1,288 | 1,410 | 1,452 | 1,557 | 1,718 | 1,763 | 1,783 | 1,609 | -9.8 | 4.7 |

a Petroleum and nonpetroleum sources. **SOURCES:** Japan Ministry of Economy, Trade & Industry; Korea National Statistical Office, South Korea; Petrochemical Industry Association of Taiwan; Taiwan Ministry of Economic Affairs

PRODUCTION

U.S. INORGANICS

Only ammonia and sodium chlorate registered increases

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 (a) | ANNUAL CHANGE | |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 1996-06 |
| Aluminum sulfate (b) | 1,086 | 1,053 | 1,058 | 1,085 | 976 | 1,020 | 1,053 | 961 | 971 | 967 | 898 | -7.1% | -1.9% |
| Ammonia (c) | 16,256 | 16,227 | 16,757 | 15,725 | 14,339 | 11,090 | 12,574 | 10,466 | 10,937 | 10,141 | 10,359 | 2.1 | -4.4 |
| Ammonium nitrate (d) | 7,708 | 7,804 | 8,235 | 6,920 | 7,237 | 5,833 | 6,436 | 5,733 | 6,558 | 7,638 | 6,301 | -17.5 | -2.0 |
| Ammonium sulfate (e) | 2,414 | 2,451 | 2,528 | 2,357 | 2,547 | 2,347 | 2,671 | 2,604 | 2,726 | 2,636 | 2,603 | -1.2 | 0.8 |
| Chlorine (f) | 11,301 | 11,720 | 11,647 | 12,111 | 12,698 | 11,487 | 11,681 | 10,359 | 12,326 | 10,275 | 10,248 | -0.3 | -1.0 |
| Hydrochloric acid (g) | 3,733 | 4,145 | 4,226 | 4,081 | 4,278 | 3,969 | 4,037 | 4,180 | 5,301 | 4,618 | 4,113 | -10.9 | 1.0 |
| Nitric acid, 100% (h) | 8,349 | 8,556 | 8,422 | 8,113 | 7,898 | 6,416 | 6,940 | 6,747 | 6,466 | 6,710 | 6,636 | -1.1 | -2.3 |
| Phosphoric acid, P ₂ O ₅ | 11,982 | 11,935 | 12,599 | 12,433 | 11,330 | 10,472 | 11,146 | 11,324 | 11,511 | 11,437 | 10,704 | -6.4 | -1.1 |
| Sodium chlorate | 600 | 568 | 707 | 742 | 853 | 792 | 721 | 669 | 556 | 523 | 558 | 6.6 | -0.7 |
| Sodium hydroxide | 10,488 | 9,953 | 11,894 | 11,972 | 10,451 | 9,811 | 9,459 | 8,793 | 9,618 | 8,519 | 7,993 | -6.2 | -2.7 |
| Sodium sulfate (i) | 602 | 640 | 571 | 599 | 462 | 513 | 500 | 466 | 469 | 467 | 443 | -5.2 | -3.0 |
| Sulfuric acid (j) | 43,327 | 43,472 | 44,000 | 40,594 | 39,584 | 36,338 | 36,062 | 37,373 | 38,021 | 37,147 | 35,954 | -3.2 | -1.8 |

a Preliminary data. b Commercial, 17% Al₂O₃; includes production by municipalities. c Synthetic anhydrous; excludes by-product ammonia liquor and ammonium sulfate. d Original solution. e Synthetic and noncoke by-product. f Includes quantities liquefied for use, storage, or shipment. g Includes anhydrous hydrochloric acid production. h Includes unspecified amounts produced but not withdrawn from the system. i Anhydrous, high and low purity, and Glauber's salt. j Gross (new and fortified).

SOURCES: Department of Commerce, Bureau of the Census

CANADA INORGANICS

Production for many products declined in 2006

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 1996-06 |
| Aluminum sulfate | 172 | 162 | 191 | 205 | 167 | 170 | 176 | 171 | 167 | 175 | 164 | -6.3% | -0.5% |
| Ammonia | 4,682 | 4,768 | 4,737 | 4,889 | 4,888 | 4,297 | 4,501 | 4,455 | 4,996 | 4,607 | 4,623 | 0.3 | -0.1 |
| Ammonium nitrate | 1,059 | 979 | 1,000 | 1,052 | 1,110 | 1,174 | 1,152 | 1,031 | 1,096 | 1,206 | 1,181 | -2.1 | 1.1 |
| Carbon black | 185 | 205 | 217 | 218 | 229 | 215 | 215 | 205 | 223 | 235 | 225 | -4.3 | 2.0 |
| Chlorine | 1,119 | 1,067 | 989 | 1,065 | 1,079 | 1,054 | 1,095 | 994 | 1,057 | 1,004 | 929 | -7.5 | -1.8 |
| Hydrochloric acid | 147 | 142 | 149 | 157 | 155 | 143 | 151 | 153 | 149 | 142 | 155 | 9.2% | 0.5% |
| Hydrogen peroxide | 156 | 179 | 199 | 228 | 237 | 203 | 222 | 226 | 244 | 244 | na | na | na |
| Nitric acid | 1,039 | 1,002 | 935 | 1,007 | 1,074 | 1,054 | 1,143 | 1,105 | 1,219 | 1,147 | 1,180 | 2.9 | 1.3 |
| Sodium chlorate | 926 | 1,038 | 1,012 | 1,048 | 1,107 | 1,082 | 1,055 | 1,129 | 1,183 | 1,169 | 1,111 | -5.0 | 1.8 |
| Sodium hydroxide | 1,154 | 1,099 | 1,015 | 1,082 | 1,094 | 1,074 | 1,111 | 1,059 | 1,146 | 1,119 | 1,012 | -9.6 | -1.3 |
| Sulfuric acid | 4,278 | 4,088 | 4,333 | 4,194 | 3,804 | 3,846 | 3,887 | 3,465 | 3,933 | 3,743 | 3,823 | 2.1 | -1.1 |

na = not available. SOURCE: Statistics Canada

JAPAN INORGANICS

Output of chlorine and titanium dioxide contracted by 5% or more

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | |
|-----------------------------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 1996-06 |
| Ammonia | 1,811 | 1,836 | 1,689 | 1,685 | 1,715 | 1,604 | 1,450 | 1,291 | 1,340 | 1,318 | 1,328 | 0.8% | -3.1% |
| Ammonium sulfate (a) | 1,756 | 1,780 | 1,618 | 1,716 | 1,749 | 1,585 | 1,564 | 1,570 | 1,526 | 1,458 | 1,439 | -1.3 | -2.0 |
| Carbon black | 757 | 776 | 723 | 761 | 788 | 742 | 755 | 788 | 804 | 805 | 827 | 2.7 | 0.9 |
| Chlorine, liquid | 894 | 928 | 881 | 875 | 847 | 777 | 754 | 723 | 619 | 601 | 571 | -5.0 | -4.4 |
| Hydrochloric acid | 2,416 | 2,539 | 2,408 | 2,448 | 2,494 | 2,342 | 2,317 | 2,363 | 2,324 | 2,308 | 2,326 | 0.8 | -0.4 |
| Hydrogen peroxide | 143 | 141 | 140 | 145 | 151 | 159 | 167 | 176 | 196 | 197 | 221 | 12.2 | 4.4 |
| Nitrogen (mcm) | 9,314 | 9,676 | 9,716 | 9,855 | 10,290 | 10,296 | 10,455 | 10,835 | 11,281 | 11,435 | 11,998 | 4.9 | 2.6 |
| Oxygen (mcm) | 8,904 | 9,795 | 9,188 | 9,534 | 10,655 | 10,373 | 10,720 | 11,250 | 11,278 | 11,371 | 11,766 | 3.5 | 2.8 |
| Sodium hydroxide | 4,062 | 4,391 | 4,252 | 4,345 | 4,471 | 4,291 | 4,271 | 4,369 | 4,493 | 4,552 | 4,453 | -2.2 | 0.9 |
| Sodium silicate | 800 | 795 | 765 | 769 | 720 | 679 | 622 | 596 | 577 | 546 | 541 | -0.9 | -3.8 |
| Sulfuric acid | 6,851 | 6,828 | 6,739 | 6,943 | 7,059 | 6,727 | 6,763 | 6,534 | 6,444 | 6,546 | 6,843 | 4.5 | -0.0 |
| Titanium dioxide | 238 | 241 | 251 | 269 | 270 | 257 | 240 | 253 | 253 | 259 | 240 | -7.3 | 0.1 |

a For agricultural and nonagricultural use. mcm = millions of cubic meters. SOURCE: Ministry of Economy, Trade & Industry

EUROPE INORGANICS

Some inorganics showed growth, but not enough to offset declines of others

| THOUSANDS OF METRIC TONS UNLESS OTHERWISE INDICATED | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 (a) | ANNUAL CHANGE | |
|---|--------|--------|--------|-------|-------|--------|--------|--------|--------|--------|----------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 2005-06 |
| Carbon black | 687 | 1,243 | 1,386 | 1,322 | 1,342 | 1,059 | 1,025 | 1,009 | 1,468 | 1,388 | 1,400 | | 0.9% |
| Chlorine | 8,959 | 9,386 | 9,190 | 9,219 | 9,697 | 9,265 | 9,222 | 9,525 | 10,396 | 10,382 | 10,296 | | -0.8 |
| Hydrochloric acid | 1,540 | 1,907 | 1,830 | 2,098 | 2,050 | 2,608 | 4,142 | 3,784 | 5,165 | 6,002 | 5,402 | | -10.0 |
| Hydrogen (mcm) | 1,904 | 1,883 | 2,124 | 2,252 | 2,196 | 5,553 | 7,519 | 8,962 | 10,690 | 11,251 | 11,577 | | 2.9 |
| Hydrogen peroxide | 143 | 133 | 248 | 438 | 847 | 372 | 655 | 736 | 1,085 | 1,123 | 1,220 | | 8.6 |
| Nitrogen (mcm) | 11,398 | 11,950 | 10,490 | 7,422 | 8,091 | 12,829 | 13,942 | 17,807 | 22,326 | 22,457 | 21,000 | | -6.5 |
| Oxygen (mcm) | 7,044 | 10,610 | 4,674 | 5,592 | 5,965 | 12,678 | 19,026 | 22,554 | 27,112 | 27,824 | 20,929 | | -24.8 |
| Phosphoric acid (b) | 615 | 599 | 526 | 995 | 692 | 2,463 | 3,921 | 3,574 | 4,304 | 4,257 | 3,777 | | -11.3 |
| Sodium carbonate | 1,592 | 1,589 | 4,998 | 4,567 | 4,401 | 1,451 | 1,493 | 3,874 | 6,609 | 6,956 | 7,575 | | 8.9 |
| Sodium hydroxide | 5,785 | 6,197 | 6,090 | 5,418 | 5,780 | 6,756 | 9,114 | 7,937 | 9,994 | 9,829 | 7,655 | | -22.1 |
| Sodium sulfate | 1,930 | 2,718 | 2,748 | 2,237 | 2,314 | 1,806 | 2,951 | 3,082 | 3,406 | 3,565 | 4,010 | | 12.5 |
| Sulfuric acid (c) | 5,795 | 6,586 | 6,832 | 7,109 | 6,598 | 8,157 | 13,835 | 12,746 | 16,584 | 16,609 | 15,500 | | -6.7 |
| Titanium oxides | na | na | 415 | 433 | 538 | na | 440 | 419 | 588 | 602 | 663 | | 10.1 |

NOTE: Data from 2002 forward are for 25 countries in the European Union and prior to 2002, for 15 countries. Thus, 10-year comparisons are not meaningful. **a** C&EN estimates based on partial reporting. **b** As P₂O₅. **c** As SO₃. **mcm** = millions of cubic meters. **na** = not available.

SOURCES: European Union and national government statistics offices, EuroChlor

CHINA INORGANICS

Output of sodium hydroxide jumped sharply, by nearly 22%

| THOUSANDS OF METRIC TONS | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | | |
|--------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|---------|------|
| | | | | | | | | | | | 2005-06 | 1997-06 | |
| Hydrochloric acid (31%) | 3,843 | 3,801 | 3,960 | 4,454 | 4,705 | 4,926 | 5,276 | 6,007 | 6,582 | 7,306 | | 11.0% | 74% |
| Sodium carbonate | 7,285 | 7,368 | 7,486 | 9,199 | 9,144 | 10,189 | 11,075 | 12,668 | 14,211 | 15,972 | | 12.4 | 9.1 |
| Sodium hydroxide | 5,483 | 5,184 | 5,495 | 7,123 | 7,880 | 8,227 | 9,399 | 10,603 | 12,400 | 15,118 | | 21.9 | 11.9 |
| Sulfuric acid | 19,460 | 20,519 | 21,589 | 23,888 | 26,963 | 29,674 | 33,191 | 38,249 | 44,621 | 48,603 | | 8.9 | 10.7 |

SOURCE: China National Chemical Information Center

U.S. PLASTICS

High-density and linear low-density polyethylene posted gains of more than 7%

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | | |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|-------------|------------|
| | | | | | | | | | | | | 2005-06 | 1996-06 | |
| THERMOPLASTIC RESINS | | | | | | | | | | | | | | |
| Polyethylene | | | | | | | | | | | | | | |
| Low-density (a,b) | 3,531 | 3,489 | 3,437 | 3,493 | 3,436 | 3,491 | 3,647 | 3,540 | 3,763 | 3,558 | 3,564 | | 0.2% | 0.1% |
| Linear low-density (a,b) | 2,885 | 3,124 | 3,278 | 3,677 | 3,607 | 4,659 | 5,139 | 5,052 | 5,640 | 5,395 | 5,777 | | 7.1 | 7.2 |
| High-density (c) | 5,612 | 5,696 | 5,862 | 6,289 | 6,336 | 6,933 | 7,243 | 7,126 | 7,960 | 7,328 | 7,991 | | 9.1 | 3.6 |
| Polypropylene (d) | 5,439 | 6,042 | 6,271 | 7,028 | 7,139 | 7,228 | 7,691 | 8,013 | 8,415 | 8,149 | 8,301 | | 1.9 | 4.3 |
| Styrene polymers | | | | | | | | | | | | | | |
| Polystyrene (e) | 2,751 | 2,894 | 2,829 | 2,935 | 3,104 | 2,773 | 3,025 | 2,900 | 3,062 | 2,855 | 2,844 | | -0.4 | 0.3 |
| Acrylonitrile-butadiene-styrene & other styrene polymers (d,f) | 1,402 | 1,403 | 1,503 | 1,462 | 1,473 | 1,294 | 1,382 | 1,351 | 1,466 | 1,413 | 1,411 | | -0.2 | 0.1 |
| Polyamine, nylon type | 500 | 554 | 583 | 612 | 581 | 517 | 578 | 580 | 608 | 568 | 576 | | 1.4 | 1.4 |
| Polyvinyl chloride & copolymers (d) | 5,997 | 6,388 | 6,578 | 6,764 | 6,551 | 6,467 | 6,939 | 6,669 | 7,251 | 6,921 | 6,767 | | -2.2 | 1.2 |
| THERMOSETTING RESINS | | | | | | | | | | | | | | |
| Epoxy (g) | 300 | 297 | 290 | 298 | 314 | 273 | 297 | 262 | 293 | 276 | 283 | | 2.5% | -0.6% |
| Urea & melamine | 1,104 | 1,197 | 1,302 | 1,354 | 1,437 | 1,379 | 1,460 | 1,440 | 1,504 | 1,524 | 1,556 | | 2.1 | 3.5 |
| Phenolic | 1,577 | 1,694 | 1,787 | 1,990 | 1,974 | 1,979 | 2,013 | 2,015 | 2,102 | 2,127 | 2,263 | | 6.4 | 3.7 |

NOTE: Totals are for those products listed and exclude some small-volume plastic; dry-weight basis unless otherwise specified. **a** Density 0.940 and below. **b** Data include Canadian production from 2001. **c** Density above 0.940. **d** Data include Canadian production. **e** Data include Canadian production from 2000. **f** Data include styrene-butadiene copolymers, styrene acrylonitrile, and other styrene-based polymers. **g** Unmodified. **SOURCE:** American Plastics Council

PRODUCTION

CANADA PLASTICS

Volume of polyethylene climbed, as those of polyesters and polystyrene fell

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 1996-06 |
| Polyesters, unsaturated | 61 | 71 | 82 | 108 | 120 | 115 | 113 | 139 | 100 | 90 | 81 | -10.0% | 2.9% |
| Polyethylene (a) | 2,194 | 2,195 | 2,283 | 2,485 | 2,751 | 3,035 | 3,330 | 3,083 | 3,587 | 3,366 | 3,594 | 6.8 | 5.1 |
| Polystyrene (b) | 209 | 181 | 180 | 200 | 203 | 186 | 195 | 183 | 207 | 198 | 195 | -1.5 | -0.7 |

a Includes high-, low-, and linear low-density polyethylene. b Includes acrylonitrile-butadiene-styrene. SOURCE: Statistics Canada

EUROPE PLASTICS

Production remained broadly steady, with synthetic rubber output rising the most

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 (a) | ANNUAL CHANGE | |
|---------------------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|----------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 2005-06 |
| Polyethylene | 3,000 | 8,508 | 9,731 | 10,223 | 10,579 | 11,487 | 11,599 | 11,942 | 13,859 | 14,529 | 14,500 | -0.2% | |
| Polystyrene | 1,044 | 1,117 | 1,090 | 675 | 331 | 2,410 | 2,550 | 2,540 | 1,790 | 1,859 | 1,860 | 0.1 | |
| Acrylonitrile-butadiene-styrene | 604 | 762 | 859 | 971 | 1,038 | 466 | 793 | 495 | 811 | 891 | 900 | 1.0 | |
| Polyvinyl chloride | 4,322 | 4,792 | 2,651 | 3,209 | 4,893 | 5,681 | 6,531 | 6,694 | 6,485 | 6,594 | 6,600 | 0.1 | |
| Epoxy resins | 282 | 373 | 334 | 393 | 419 | 215 | 464 | 356 | 633 | 693 | 690 | -0.4 | |
| Polypropylene | na | na | 4,158 | 6,524 | 6,984 | 7,526 | 8,113 | 8,638 | 8,950 | 9,050 | 9,200 | 1.7 | |
| Polyamides | 843 | 1,652 | 1,494 | 766 | 1,412 | 1,209 | 1,833 | 1,769 | 2,052 | 2,119 | 2,150 | 1.5 | |
| Synthetic rubber | 1,946 | 2,419 | 2,245 | 2,239 | 2,342 | 2,691 | 3,250 | 3,713 | 4,415 | 4,170 | 4,300 | 3.1 | |

NOTE: Data from 2002 forward are for 25 countries in the European Union and prior to 2002, for 15 countries. Thus, 10-year comparisons are not meaningful. a C&EN estimates based on partial reporting. na = not available. SOURCES: European Union and national government statistics offices, Association of Plastics Manufacturers in Europe

U.S. SYNTHETIC FIBERS

Although all categories declined, cellulose fell precipitously

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | | |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|---------|--|
| | | | | | | | | | | | | 2005-06 | 1996-06 | |
| NONCELLULOSIC FIBERS | | | | | | | | | | | | | | |
| Nylon | 1,270 | 1,286 | 1,218 | 1,217 | 1,215 | 1,019 | 1,112 | 1,115 | 1,142 | 1,082 | 1,023 | -5.5% | -2.1% | |
| Olefin | 1,162 | 1,216 | 1,326 | 1,395 | 1,461 | 1,316 | 1,397 | 1,374 | 1,388 | 1,404 | 1,293 | -7.8 | 1.1 | |
| Polyester | 1,737 | 1,855 | 1,768 | 1,763 | 1,775 | 1,464 | 1,482 | 1,374 | 1,465 | 1,368 | 1,253 | -8.4 | -3.2 | |
| CELLULOSIC FIBERS | | | | | | | | | | | | | | |
| Acetate (a) & rayon | 216 | 208 | 166 | 134 | 158 | 103 | 81 | 75 | 67 | 49 | 24 | -50.5% | -19.6% | |

a Includes diacetate and triacetate; excludes production for cigarette filters. SOURCE: Fiber Economics Bureau

JAPAN SYNTHETIC FIBERS

Polypropylene showed growth, but just barely

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | |
|-----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|
| | | | | | | | | | | | | 2005-06 | 1996-06 |
| Man-made (a) | 1,802 | 1,822 | 1,724 | 1,634 | 1,643 | 1,564 | 1,416 | 1,316 | 1,279 | 1,249 | 1,209 | -3.2% | -3.9% |
| Polyester (a) | 724 | 731 | 684 | 665 | 665 | 628 | 564 | 528 | 520 | 496 | 483 | -2.6 | -4.0 |
| Acrylic (b) | 388 | 417 | 418 | 372 | 377 | 365 | 358 | 298 | 267 | 261 | 243 | -7.0 | -4.6 |
| Polypropylene (a) | 100 | 110 | 109 | 109 | 112 | 117 | 114 | 116 | 120 | 125 | 127 | 1.4 | 2.4 |
| Nylon (c) | 201 | 198 | 180 | 174 | 176 | 163 | 126 | 121 | 121 | 118 | 118 | 0.0 | -5.2 |

a Sum of staple and filament. b Staple only. c Filament only. SOURCE: Ministry of Economy, Trade & Industry

ASIA PLASTICS

Only South Korea posted positive 10-year growth for all categories

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 1996-06 |
| JAPAN | | | | | | | | | | | | | |
| Polyethylene | 3,313 | 3,366 | 3,143 | 3,369 | 3,342 | 3,294 | 3,176 | 3,165 | 3,238 | 3,240 | 3,162 | -2.4% | -0.5% |
| Polyethylene terephthalate | 1,360 | 1,398 | 1,300 | 1,281 | 1,308 | 1,243 | 1,211 | 1,076 | 1,195 | 1,126 | 1,110 | -1.4 | -2.0 |
| Polypropylene | 2,730 | 2,854 | 2,520 | 2,626 | 2,721 | 2,696 | 2,641 | 2,751 | 2,908 | 3,063 | 3,049 | -0.5 | 1.1 |
| Polystyrene | 2,178 | 2,201 | 1,975 | 2,037 | 2,024 | 1,810 | 1,837 | 1,801 | 1,824 | 1,734 | 1,745 | 0.6 | -2.2 |
| Polyvinyl chloride | 2,511 | 2,626 | 2,457 | 2,460 | 2,410 | 2,195 | 2,225 | 2,164 | 2,153 | 2,151 | 2,146 | -0.2 | -1.6 |
| Epoxy | 201 | 222 | 204 | 225 | 243 | 192 | 201 | 195 | 215 | 211 | 229 | 8.5 | 1.3 |
| Phenolic resins | 294 | 303 | 259 | 250 | 262 | 232 | 242 | 261 | 287 | 280 | 284 | 1.4 | -0.3 |
| Polycarbonate | 251 | 292 | 317 | 351 | 354 | 370 | 386 | 409 | 411 | 431 | 413 | -4.2 | 5.1 |
| Synthetic rubber | 1,520 | 1,592 | 1,520 | 1,577 | 1,590 | 1,466 | 1,522 | 1,577 | 1,616 | 1,627 | 1,607 | -1.2 | 0.6 |
| SOUTH KOREA | | | | | | | | | | | | | |
| Acrylonitrile-butadiene-styrene | 560 | 596 | 636 | 784 | 777 | 932 | 1,120 | 1,143 | 1,105 | 980 | 1,077 | 9.9% | 6.8% |
| Polyethylene, high-density | 1,340 | 1,549 | 1,615 | 1,756 | 1,706 | 1,839 | 1,871 | 1,925 | 1,882 | 1,949 | 1,935 | -0.7 | 3.7 |
| Polyethylene, low-density | 1,256 | 1,394 | 1,518 | 1,642 | 1,576 | 1,614 | 1,624 | 1,627 | 1,706 | 1,744 | 1,728 | -0.9 | 3.2 |
| Polypropylene | 1,738 | 2,056 | 2,355 | 2,440 | 2,413 | 2,485 | 2,622 | 2,811 | 2,930 | 3,013 | 3,040 | 0.9 | 5.8 |
| Polystyrene | 1,000 | 1,104 | 1,038 | 1,105 | 1,212 | 1,354 | 1,361 | 1,427 | 1,176 | 1,093 | 1,009 | -7.7 | 0.1 |
| Polyvinyl chloride | 1,005 | 1,087 | 1,013 | 1,170 | 1,191 | 1,238 | 1,244 | 1,278 | 1,306 | 1,184 | 1,203 | 1.6 | 1.8 |
| TAIWAN | | | | | | | | | | | | | |
| Acrylonitrile-butadiene-styrene | 911 | 979 | 899 | 1,016 | 1,067 | 985 | 1,078 | 1,105 | 1,166 | 1,215 | 1,274 | 4.9% | 3.4% |
| Polyester resin | 146 | 171 | 175 | 204 | 198 | 204 | 219 | 212 | 185 | 168 | 162 | -3.6 | 1.1 |
| Polyethylene, high-density | 241 | 243 | 273 | 395 | 306 | 510 | 507 | 547 | 537 | 515 | 521 | 1.2 | 8.0 |
| Polyethylene, low-density | 233 | 235 | 224 | 236 | 273 | 477 | 492 | 536 | 609 | 663 | 597 | -10.0 | 9.9 |
| Polypropylene | 448 | 420 | 418 | 517 | 564 | 773 | 830 | 937 | 1,020 | 1,098 | 1,174 | 6.9 | 10.1 |
| Polystyrene | 808 | 780 | 764 | 765 | 711 | 866 | 848 | 858 | 817 | 830 | 713 | -14.1 | -1.2 |
| Polyurethane resin | 127 | 151 | 145 | 157 | 185 | 170 | 189 | 193 | 214 | 195 | 191 | -2.1 | 4.2 |
| Styrene-butadiene rubber | 98 | 103 | 107 | 104 | 83 | 81 | 78 | 69 | 108 | 96 | 102 | 6.3 | 0.4 |
| Polybutadiene rubber | 51 | 55 | 56 | 54 | 50 | 52 | 52 | 54 | 56 | 53 | 50 | -5.7 | -0.2 |

SOURCES: Japan Ministry of Economy, Trade & Industry; Korea National Statistical Office, South Korea; Petrochemical Industry Association of Taiwan; Taiwan Ministry of Economic Affairs

EUROPE SYNTHETIC FIBERS

Cellulosics picked up in 2006, but production of other synthetic fibers sagged

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 (a) | 2006 (a) | ANNUAL CHANGE | |
|-----------------------------|------|------|------|------|------|------|------|-------|-------|----------|----------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 2005-06 |
| Acrylic | 677 | 705 | 650 | 614 | 623 | 607 | 620 | 856 | 862 | 589 | 562 | -4.6% | |
| Polyester | 895 | 995 | 959 | 909 | 968 | 924 | 909 | 1,423 | 1,473 | 1,005 | 975 | -3.0 | |
| Polyamide | 632 | 673 | 641 | 595 | 636 | 555 | 549 | 670 | 682 | 676 | 663 | -1.9 | |
| Cellulosics | 766 | 722 | 715 | 651 | 627 | 607 | 585 | 609 | 636 | 506 | 570 | 12.6 | |

NOTE: Database was revised in 2001 and again in 2003. Data for 2003 and 2004 include enlarged European Union and Turkey. **a** Data for 2005 and 2006 include Russia and Confederation of Independent States and exclude Turkey. **SOURCES:** International Rayon & Synthetic Fibers Committee, Fiber Economics Bureau estimates

PRODUCTION

U.S. FERTILIZERS

Production of ammonium sulfate grew meagerly, while output for all others plunged

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | ANNUAL CHANGE | |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|-----------|
| | | | | | | | | | | | | 2005-06 | 1996-2006 |
| NITROGEN PRODUCTS | | | | | | | | | | | | | |
| Ammonia | 14,671 | 15,160 | 15,032 | 14,484 | 13,438 | 10,455 | 11,306 | 10,475 | 9,164 | 8,945 | 7,209 | -19.4% | -6.9% |
| Ammonium nitrate | 2,431 | 3,012 | 3,183 | 3,165 | 2,873 | 2,192 | 2,246 | 2,142 | 2,165 | 2,473 | 2,045 | -17.3 | -1.7 |
| Ammonium sulfate | 2,330 | 2,424 | 2,453 | 2,517 | 2,595 | 2,353 | 2,405 | 2,595 | 2,669 | 2,676 | 2,706 | 1.1 | 1.5 |
| Urea | 4,822 | 4,989 | 4,850 | 5,066 | 4,742 | 3,678 | 4,477 | 4,443 | 3,095 | 3,086 | 2,284 | -26.0 | -7.2 |
| Nitrogen solutions | 8,178 | 8,994 | 8,980 | 10,136 | 9,038 | 9,144 | 7,985 | 8,863 | 7,781 | 8,062 | 7,022 | -12.9 | -1.5 |
| PHOSPHATE PRODUCTS | | | | | | | | | | | | | |
| Diammonium phosphate | 14,155 | 14,325 | 14,088 | 14,528 | 12,670 | 10,049 | 10,825 | 9,991 | 10,404 | 9,988 | 9,474 | -5.1% | -3.9% |
| Monoammonium phosphate | 2,529 | 3,170 | 3,624 | 3,511 | 4,106 | 4,087 | 4,175 | 4,734 | 5,328 | 5,213 | 4,170 | -20.0 | 5.1 |
| Phosphate rock | 40,911 | 40,890 | 37,814 | 38,353 | 36,088 | 34,219 | 29,183 | 32,327 | 35,338 | 35,183 | 33,127 | -5.8 | -2.1 |
| Phosphoric acid (P ₂ O ₅) | 11,073 | 11,494 | 11,264 | 11,470 | 10,751 | 9,406 | 10,125 | 10,253 | 10,530 | 10,533 | 9,802 | -6.9 | -1.2 |

NOTE: Years ending June 30. Figures are based on Fertilizer Institute surveys and may not represent the entire industry. **SOURCE:** Fertilizer Institute

EUROPE FERTILIZERS

So-so season marked fertilizer industry, with some chemicals up and some down

| THOUSANDS OF METRIC TONS | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 (a) | ANNUAL CHANGE | |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|----------|---------------|---------|
| | | | | | | | | | | | | 2005-06 | 2005-06 |
| Ammonium nitrate | 1,460 | 1,171 | 631 | 897 | 721 | 687 | 1,505 | 1,168 | 6,656 | 6,138 | 6,400 | 4.3% | |
| Ammonium sulfate | 475 | 478 | 585 | 566 | 675 | 1,442 | 769 | 832 | 1,735 | 1,703 | 1,450 | -14.9 | |
| Anhydrous ammonia | 2,246 | 2,291 | 2,295 | 2,213 | 2,078 | 2,362 | 9,394 | 4,752 | 12,364 | 13,187 | 13,590 | 3.1 | |
| Nitric acid | 263 | 266 | 290 | 264 | 153 | 600 | 612 | 2,378 | 6,581 | 6,326 | 6,584 | 4.1 | |
| Urea | 113 | 368 | na | 600 | 725 | 214 | 947 | 767 | 2,407 | 2,822 | 2,550 | -9.6 | |

NOTE: Data from 2002 forward are for 25 countries in the European Union and prior to 2002, for 15 countries. Thus, 10-year comparisons are not meaningful. **a** C&EN estimates based on partial reporting. **na** = not available. **SOURCES:** European Union, national government statistics offices

GOT A THING FOR DATA?

If you're itching to do your own calculations with all these numbers, let yourself go ... to www.cen-online.org, that is, where you can access downloadable versions of these tables, starting on July 16.