

EMERGING MARKETS BOOST COMMERCE

Global **TRADE** in chemicals grew despite economic downturn

WORLDWIDE TRADE in chemicals increased in 2008, part of a larger trend of increasing globalization of the industry. Full-year figures suggest that although chemical production closely follows economic cycles, longer term economic forces—namely the pace of development in emerging markets—governs the volume of international trade.

In the U.S., the chemical industry kept its status as the number-two exporting sector, after machinery and transport equipment. The total value of chemicals exported by U.S. chemical makers in 2008 exceeded \$179 billion, or more than 17% of the \$1 trillion in total U.S. exports.

The U.S. enjoyed a second year of positive chemical trade balance. A major reason for the short streak was the low value of the dollar compared with other currencies, especially the euro. The low dollar made U.S. exports especially price-competitive in 2008 compared with 2002–06, when the chemical trade balance was negative. The dollar strengthened toward the end of 2008, however, and the trade surplus for the year narrowed.

The biggest U.S. trading partner by far was Europe, and despite the cheap dollar, the U.S. imports significantly more chemi-

cals from Europe than it exports. But the rate of growth of trade between the U.S. and many emerging markets rose faster than that with Europe. Imports from China and Vietnam soared 48.0% for the year, and imports from the Middle East jumped 40.7%. Trade with Latin America was also strong. Although the U.S. exports far more than it imports from the region, imports grew at a faster pace in 2008 than in 2007.

The biggest product category of U.S. trade in 2008 was medicinals and pharmaceuticals, edging out organic chemicals. Pharmaceuticals are also the biggest source of negative trade for the U.S., and the deficit has grown significantly over the past 10 years. On the other hand, plastics had the strongest trade balance last year: The U.S. exported 8.6% more plastics in 2008 than in 2007.

Trade in fertilizers and other agricultural chemicals, although a relatively small portion of overall trade, skyrocketed in the U.S., as well as in Canada and Japan. Soaring prices for food commodities, driven in large part by growing populations in Asia, sent demand for agricultural products through the roof.

Canada, home of the fertilizer makers Agrium and Potash Corp., exported 43.1%

more agricultural products in 2008 than in the previous year. But overall, the country's trade deficit widened, mostly due to an 11.8% drop in exports of basic chemicals. Canada's biggest trading partner is its neighbor to the south. Yet in 2008, the share of its chemical imports coming from the U.S. fell to less than 60%, continuing a three-year slide.

In Europe, as in the U.S., trade with developing countries showed dramatic increases. At the same time, European trade with developed countries either stayed flat or declined. European imports to and exports from Russia, China, and Brazil all posted double-digit growth in 2008. In contrast, trade with the U.S., Canada, and Japan saw declines. The biggest drop in imports was from Canada, decreasing more than 30% for the year. Only exports to Japan increased, and the growth was less than 1%.

In Asia, the biggest news was the speed with which China's chemical trade deficit continued to narrow: Exports rose 34.7%, and imports grew by only 12.2%. China's deficit in organic chemicals came down from \$14.2 billion in 2007 to \$10.2 billion in 2008.

Meanwhile, Japan's trade surplus shrank slightly as imports rose faster than exports. In particular, exports of organic chemicals dropped slightly while imports rose 19.8%. It was a similar story for synthetic resins: A bump in exports of 8.0% was overwhelmed by a surge in imports of 18.8%.

The trend was different in South Korea, where the chemical trade surplus continued to expand. The biggest jump was in exports of petrochemicals, which rose 11.4% while imports advanced by a mere 6.0%.

U.S. TOTAL TRADE

Chemical industry retained number-two spot among exporting sectors

\$ BILLIONS	EXPORTS				IMPORTS			
	2005	2006	2007	2008	2005	2006	2007	2008
Machinery & transport equipment	\$433.7	\$494.5	\$536.4	\$556.6	\$649.9	\$709.8	\$738.7	\$721.2
Miscellaneous manufactures	103.8	116.0	127.1	134.1	259.8	276.4	293.8	290.0
Chemicals	123.1	138.6	158.2	179.1	128.3	142.8	155.4	176.8
Manufactured goods classified by material	89.2	103.5	112.5	125.0	190.8	223.0	227.2	231.7
Food & live animals	48.3	54.3	62.3	85.8	51.4	56.1	60.9	66.2
Crude materials, inedible (except fuels)	41.2	50.1	62.4	76.5	28.6	30.4	30.5	32.9
Mineral fuels & lubricants	26.4	34.9	42.0	76.5	286.4	333.5	360.9	487.9
Beverages & tobacco	4.5	5.1	5.4	5.5	13.9	15.8	17.3	17.2
Animal & vegetable oils, fats & waxes	1.8	2.1	2.9	4.4	2.4	2.9	3.3	5.1
Other	32.5	38.2	53.5	56.5	59.5	64.4	65.7	71.1
TOTAL	\$904.5	\$1,037.3	\$1,162.7	\$1,300.1	\$1,671.0	\$1,855.1	\$1,953.7	\$2,100.1

NOTE: Totals may not sum because of rounding. **SOURCE:** Department of Commerce

U.S. CHEMICAL TRADE, BY REGION

Exports to all major regions except Canada increased at double-digit rates

\$ MILLIONS	2005		2006		2007		2008		CHANGE, 2007-08	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS
Europe	\$39,853	\$73,136	\$45,398	\$79,653	\$52,546	\$85,976	\$59,352	\$94,902	13.0%	10.4%
Canada	22,413	19,727	24,583	22,172	25,498	24,335	27,118	27,099	6.4	11.4
Latin America	25,459	8,616	30,064	10,385	34,345	10,358	40,123	12,893	16.8	24.5
Japan	8,166	8,500	8,653	8,029	9,373	8,599	10,636	8,731	13.5	1.5
China-Vietnam	5,549	5,216	6,402	6,286	8,648	7,315	9,588	10,823	10.9	48.0
Rest of Asia	15,904	8,023	17,095	10,589	19,593	12,290	23,075	13,612	17.8	10.8
Australia	2,435	620	2,400	755	2843	843	3,299	893	16.0	5.9
Middle East	1,848	3,602	2,057	4,052	2,931	4,509	3,419	6,346	16.6	40.7
Africa	983	747	1,206	686	1,502	963	1,690	1,298	12.5	34.8
Other	508	100	722	168	911	171	835	227	-8.3	32.7
TOTAL	\$123,118	\$128,287	\$138,580	\$142,775	\$158,190	\$155,359	\$179,137	\$176,825	13.2%	13.8%

NOTE: Totals may not sum because of rounding. **SOURCE:** Department of Commerce

EUROPE CHEMICAL TRADE, BY COUNTRY

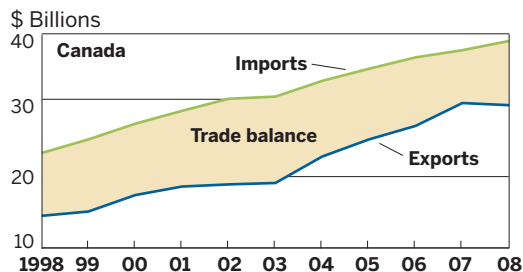
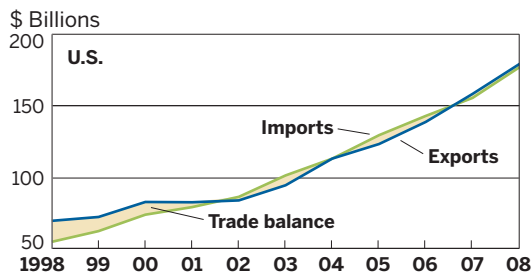
Trade with developing nations soared while exchanges with developed countries slowed

\$ MILLIONS	2005		2006		2007		2008		CHANGE, 2007-08	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS
Brazil	\$4,751	\$1,545	\$5,399	\$1,950	\$6,359	\$2,561	\$7,664	\$3,130	20.5%	22.2%
Canada	6,343	2,371	7,315	3,302	7,616	5,003	7,490	3,430	-1.6	-31.4
China	7,629	7,626	8,981	9,231	10,854	11,093	12,527	13,680	15.4	23.3
Japan	13,196	8,887	13,498	9,066	12,931	9,604	13,012	9,082	0.6	-5.4
Russia	12,109	5,452	16,097	5,929	18,237	6,624	20,614	7,826	13.0	18.1
U.S.	71,571	45,996	80,929	51,015	82,109	52,828	79,823	52,386	-2.8	-0.8

NOTE: Figures are totals for 27 countries in the European Union. All figures were converted at the 2008 average exchange rate of \$1.00 U.S. = 0.679 euros. **SOURCE:** European Union

NORTH AMERICAN CHEMICALS

The U.S. trade surplus narrowed slightly in 2008 while Canada's deficit grew for the first time since 2003



NOTE: Canadian trade for all years was converted at the 2008 average exchange rate of \$1.00 U.S. = \$1.066 Canadian. **SOURCES:** Department of Commerce, Industry Canada, Statistics Canada

TRADE

U.S. CHEMICAL TRADE, BY PRODUCT

Overall exports and imports jumped in almost equal measure

\$ MILLIONS	2005		2006		2007		2008		CHANGE, 2007-08	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS
Organic chemicals	\$26,836	\$38,140	\$30,401	\$42,301	\$34,407	\$42,238	\$34,815	\$47,773	1.2%	13.1%
Plastics in primary form	21,458	11,078	24,444	11,969	28,458	11,440	30,918	12,088	8.6	5.7
Medicinals & pharmaceuticals	25,952	39,039	29,109	45,957	33,464	53,688	38,225	59,565	14.2	10.9
Inorganic chemicals	7,854	10,169	9,219	11,391	10,958	13,375	13,094	16,832	19.5	25.8
Plastics in nonprimary form	7,992	6,314	8,744	6,845	9,278	6,811	10,059	6,830	8.4	0.3
Perfume, toilet & cleaning materials	8,409	7,926	9,495	8,332	10,645	8,870	12,149	9,564	14.1	7.8
Dyeing, tanning & coloring materials	5,018	2,970	5,461	3,055	5,906	3,116	6,367	3,074	7.8	-1.3
Fertilizers	3,203	3,699	3,170	3,441	3,742	4,969	7,468	8,393	99.6	68.9
Other	16,398	8,952	18,537	9,484	21,332	10,852	26,041	12,706	22.1	17.1
TOTAL	\$123,120	\$128,287	\$138,580	\$142,775	\$158,190	\$155,359	\$179,137	\$176,825	13.2%	13.8%

NOTE: Totals may not sum because of rounding. SOURCE: Department of Commerce

CANADA CHEMICAL TRADE, BY PRODUCT

Exports of basic chemicals sank in 2008

\$ MILLIONS	2005		2006		2007		2008		CHANGE, 2007-08	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS
Basic chemicals	\$8,793	\$8,783	\$9,512	\$9,326	\$11,576	\$9,656	\$10,207	\$9,874	-11.8%	2.3%
Resins, synthetic rubber & fibers	6,994	6,893	7,247	6,810	6,939	6,380	7,044	6,555	1.5	2.7
Pesticides, fertilizers & other agricultural chemicals	1,566	1,425	1,467	1,448	1,574	1,637	2,253	2,255	43.1	37.8
Pharmaceuticals & medicine	4,068	9,409	5,105	10,493	6,381	11,326	6,348	11,419	-0.5	0.8
Other chemical products	3,777	8,581	3,811	8,640	3,866	8,671	4,159	8,917	7.6	2.8
TOTAL	\$25,198	\$35,091	\$27,144	\$36,718	\$30,336	\$37,669	\$30,013	\$39,023	-1.1%	3.6%
TOTAL WITH U.S.	\$20,054	\$22,923	\$21,318	\$23,052	\$21,962	\$22,647	\$22,925	\$23,216	4.4%	2.5%
U.S. SHARE	79.6%	65.3%	78.5%	62.8%	72.4%	60.1%	76.4%	59.5%		

NOTE: Monetary statistics for all years were converted at the 2008 average exchange rate of \$1.00 U.S. = \$1.066 Canadian. Totals may not sum because of rounding. SOURCES: Statistics Canada, Industry Canada

ASIA CHEMICAL TRADE, BY PRODUCT

Japan exported fewer organics, but growth in trade was otherwise strong

\$ MILLIONS	2005		2006		2007		2008		CHANGE, 2007-08	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS
JAPAN										
Organic chemicals	\$17,883	\$11,489	\$18,589	\$12,260	\$20,751	\$13,024	\$20,228	\$15,606	-2.5%	19.8%
Inorganic chemicals	2,954	4,754	3,444	5,522	4,101	6,967	5,116	8,542	24.8	22.6
Synthetic resins	17,428	8,566	19,637	9,433	22,047	10,183	23,814	12,101	8.0	18.8
Photographic materials	4,681	319	4,703	365	4,684	406	4,641	383	-0.9	-5.7
Fertilizers	110	711	105	728	130	787	225	1,627	73.1	106.7
Dyes & pigments	3,135	1,084	3,384	1,163	3,621	1,264	3,997	1,501	10.4	18.8
Cosmetics	977	2,129	1,025	2,002	1,114	2,160	1,341	2,357	20.4	9.1
Rubber	8,584	3,219	9,243	4,099	10,450	4,268	11,749	5,455	12.4	27.8
Other (a)	12,405	12,964	14,101	13,785	15,902	15,395	17,112	17,984	7.6	16.8
TOTAL	\$68,157	\$45,235	\$74,231	\$49,357	\$82,800	\$54,454	\$88,223	\$65,556	6.5%	20.4%
SOUTH KOREA										
Chemicals & chemical products	\$27,745	\$24,502	\$31,806	\$27,573	\$37,545	\$32,433	\$42,710	\$36,658	13.8%	13.0%
Petrochemicals (b)	20,811	9,507	24,099	10,388	28,824	11,624	32,124	12,319	11.4	6.0

a Calculated by C&EN. b Defined as synthetic resins, synthetic fiber raw materials, and synthetic rubber.

SOURCES: Japan Chemical Importers & Exporters Association; Korea National Statistical Office, Republic of Korea; Korea Petrochemical Industry Association

CHINA CHEMICAL TRADE, BY PRODUCT

Exports continued to surge, but growth in imports slowed

\$ MILLIONS	2005		2006		2007		2008		CHANGE, 2007-08	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPORTS
Inorganic chemicals	\$6,944	\$4,812	\$7,626	\$6,287	\$9,661	\$6,417	\$13,332	\$9,196	38.0%	43.3%
Organic chemicals	12,133	28,019	15,542	29,859	20,597	34,826	29,097	39,270	41.3	12.8
Pharmaceutical products	1,364	1,959	1,531	2,394	2,053	3,451	2,901	4,889	41.3	41.7
Fertilizers	1,011	3,051	1,169	2,484	3,737	2,906	4,368	3,481	16.9	19.8
Dyes & pigments	2,487	3,081	3,000	3,507	3,577	3,806	3,711	4,023	3.7	5.7
Other (a)	7,914	9,661	8,884	11,653	11,490	17,163	15,444	16,062	34.4	-6.4
TOTAL	\$31,853	\$50,583	\$37,752	\$56,184	\$51,115	\$68,569	\$68,853	\$76,921	34.7%	12.2%

a Calculated by C&EN. SOURCE: Customs General Administration of the People's Republic of China

U.S. CHEMICAL TRADE BALANCE, BY PRODUCT

Trade balance stayed positive, thanks to export boost in plastics, perfume, dyes, other categories

\$ MILLIONS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Organic chemicals	-\$3,119	-\$6,106	-\$9,632	-\$12,680	-\$13,373	-\$12,425	-\$8,835	-\$11,304	-\$11,900	-\$7,831	-\$12,958
Plastics in primary form	6,476	6,330	7,439	7,189	7,471	7,761	9,858	10,380	12,475	17,018	18,830
Medicinals & pharmaceuticals	-1,224	-2,295	-1,572	-3,203	-8,570	-12,307	-11,123	-13,087	-16,848	-20,224	-21,340
Inorganic chemicals	-276	-472	-582	-463	-406	-1,663	-1,833	-2,315	-2,172	-2,417	-3,738
Plastics in nonprimary form	1,834	1,529	1,983	1,715	1,656	1,710	1,682	1,678	1,899	2,467	3,229
Perfume, toilet & cleaning materials	1,995	1,863	2,005	2,278	1,940	1,246	794	483	1,163	1,775	2,585
Dyeing, tanning & coloring materials	1,058	1,055	1,529	1,399	1,619	1,801	2,021	2,048	2,406	2,790	3,293
Fertilizers	1,714	1,618	796	357	643	422	316	-496	-271	-1,227	-925
Other	6,132	6,261	6,944	6,857	6,556	6,558	7,038	7,446	9,053	10,480	13,335
TOTAL	\$14,590	\$9,783	\$8,910	\$3,449	-\$2,464	-\$6,897	-\$82	-\$5,167	-\$4,195	\$2,831	\$2,312

NOTE: Totals may not sum because of rounding. SOURCE: Department of Commerce

CANADA CHEMICAL TRADE BALANCE, BY PRODUCT

Canada's trade deficit jumped in 2008

\$ MILLIONS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Basic chemicals	-\$1,416	-\$1,756	-\$946	-\$1,183	-\$1,113	-\$1,322	-\$719	\$9	\$186	\$1,919	\$332
Resins, synthetic rubber & fibers	-545	-657	-349	-54	-392	-220	147	101	436	559	490
Pesticides, fertilizers & other agricultural chemicals	-387	-126	-169	-326	-236	-356	-72	142	20	-63	-2
Pharmaceuticals & medicine	-2,471	-3,194	-3,855	-4,444	-5,177	-5,294	-5,207	-5,341	-5,387	-4,945	-5,071
Other chemical products	-3,976	-4,398	-4,589	-4,537	-5,011	-4,894	-4,732	-4,804	-4,828	-4,805	-4,757
TOTAL	-\$8,795	-\$10,130	-\$9,907	-\$10,544	-\$11,930	-\$12,084	-\$10,584	-\$9,893	-\$9,574	-\$7,334	-\$9,009

NOTE: Monetary statistics for all years were converted at the 2008 average exchange rate of \$1.00 U.S. = \$1.066 Canadian. Totals may not sum because of rounding. SOURCES: Industry Canada, Statistics Canada