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2011 Minerals Yearbook

MAGNESIUM COMPOUNDS

U.S. Department of the Interior
U.S. Geological Survey

December 2013

Magnesium Compounds

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An increase in domestic steel production led to increased production, imports for consumption, and consumption of dead-burned (refractory) magnesia in the United States. China continued to be the principal source of imports of dead-burned magnesia, accounting for 57% of the total. Domestic caustic-calcined magnesia production, however, decreased by 4% from that in 2010, imports for consumption were 13% lower, and apparent consumption was 8% lower. China also was the main source of caustic-calcined magnesia imports, accounting for 51% of the total.

About 55% of U.S. magnesium compounds production came from seawater and well and lake brines. The remainder was recovered from dolomite, magnesite, and olivine. With increased steel production, refractory applications accounted for about 55% of U.S. consumption of magnesium compounds. The remaining 45% of consumption was used in agricultural, chemical, environmental, and other applications.

World production of magnesite increased slightly in 2011 to 20.5 million metric tons (Mt). China, with 71% of the total, was the world's leading magnesite producer.

Legislation and Government Programs

The U.S. Department of Commerce, International Trade Administration, initiated administrative reviews of its antidumping and countervailing duties for United States imports of magnesia-carbon brick from China and antidumping duties for magnesia-carbon brick from Mexico, which were established in 2010 (U.S. Department of Commerce, International Trade Administration, 2011).

Production

As the global economy began to recover, domestic production of all magnesium compounds increased, with the exception of caustic-calcined magnesia (table 3). Refractory magnesia production increased because of an increase in steel production. Magnesium hydroxide production was 16% higher, and magnesium sulfate production increased by 7%. Some of the decline in caustic-calcined magnesia production may have been offset by the increased magnesium hydroxide production. Both products can be used for water treatment, and magnesium hydroxide may have substituted for magnesium oxide in this application.

Data for magnesium compounds were collected by the U.S. Geological Survey (USGS) from one voluntary survey of U.S. operations. Of the 12 operations canvassed, 9 responded, representing 97% of the magnesium compounds shipped and used, including data for some compounds that were not reportable in table 3. Data for the three nonrespondents were estimated on the basis of prior-year production levels.

Fused magnesia was produced by one company in the United States, UCM Group PLC of the United Kingdom, which operated a plant in Cherokee, AL, through its UCM Magnesia Inc. subsidiary. Two companies in the United States produced olivine—Unimin Corp. and Olivine Corp. Unimin operated a mine in North Carolina and processing plants in Indiana and North Carolina. Olivine operated one mine and one processing plant in Washington.

Great Salt Lake Minerals Corp. (a subsidiary of Compass Minerals International, Inc.) began to incrementally increase its magnesium chloride brine production capacity for a total addition of 450,000 metric tons per year (t/yr). The company planned to use new technology to increase the efficiency of its solar evaporation ponds near the Great Salt Lake and bring its total magnesium chloride brine production capacity to 1 million metric tons per year by 2015. The company's production was marketed mainly for deicing applications (Compass Minerals International, Inc., 2011).

Brazil's Magnesita Refratários S.A. planned to increase the refractory basic brick capacity at its York, PA, plant by 28,000 t/yr beginning in late summer 2012. The company planned to install two new presses to manufacture magnesia-alumina-carbon products for steel ladle linings and magnesia-carbon products used in steel and other applications. Dead-burned magnesia feed material was expected to be supplied from Magnesita's operations in Brazil (Business Wire, 2011).

Norwegian firm Sibelco Nordic (owner of Unimin) announced that the olivine mine in North Carolina and the processing plant in Aurora, IN, would be closed in spring 2011 and that it would supply the North American market with production from its Åheim Mine in Norway. The company planned to construct additional silos at its Åheim plant to store the olivine before shipment to North America (Sibelco Nordic, 2011, p. 11). The closure of this mine leaves the mine in Washington as the sole U.S. olivine producer.

Consumption

In 2011, environmental applications (water treatment and stack-gas scrubbing), remained the largest tonnage end use for caustic-calcined magnesia, with 42% of the total. The other major end-use sectors for caustic-calcined magnesia (with the individual components in descending order of consumption in parentheses) were agriculture (animal feed and fertilizers), 30% and chemical intermediates, 26%. The remaining categories each had less than 2% of the total use—manufacturing (rubber and electrical), construction (primarily oxychloride and oxysulfate cements), and medicines and cosmetics.

Magnesium hydroxide was used for water treatment, as a chemical intermediate, in medicines and pharmaceuticals,

and in fertilizer (in descending order of quantity). Magnesium sulfate was used mostly for chemicals, fertilizers, rubber, pulp and paper, pharmaceuticals, and water treatment (in descending order of quantity). Magnesium chloride was used mainly for ice control. Magnesium chloride brines were used for road dust and ice control.

Foreign Trade

Dead-burned and fused magnesia exports in 2011 were more than double 2010 exports, beginning to return to the level before the 2008–09 global recession. South Africa (51%) and Canada (23%) were the principal destinations. Caustic-calcined magnesia exports were 40% less than those in 2010. China (55%) and Peru (25%) were the main destinations (table 4).

Imports of dead-burned and fused magnesia were 19% higher than those in 2010, reflecting an increase in steel production; data reported by the World Steel Association (2012b) indicated that U.S. steel production increased by about 7% from 2010 to 2011. Imports of dead-burned and fused magnesia from China were 57% of the total, followed by Russia (11%), Ukraine (10%), and Australia and Brazil (7% each). Imports of caustic-calcined magnesia were about 13% less than those in 2010. China (51%) and Canada (36%) remained the principal sources (table 6).

Trade data for olivine are not available separately from the U.S. Census Bureau. The Journal of Commerce PIERS database, however, provides data on material that travels by ship. According to PIERS, U.S. exports of olivine in 2011 were 16 metric tons (t) to Taiwan. U.S. olivine imports were 23,200 t; 87% came from Norway and 12% came from China; the remainder was from Germany, Japan, the Netherlands, and Taiwan. Olivine was thought to be included in the Harmonized Tariff Schedule number for iron ore.

World Review

The largest capacity magnesite processing facilities in the world are in China and Russia. These countries accounted for about two-thirds of world magnesia from magnesite production capacity. Japan, the Netherlands, and the United States accounted for about 56% of the world's magnesia production capacity from seawater or brines. Fused magnesia was produced in Australia, Brazil, China, Israel, Japan, the Republic of Korea, Mexico, Russia, the United Kingdom, and the United States. World production capacity for fused magnesia was estimated to be about 560,000 t/yr, including about 372,000 t/yr of capacity in China (Schroeder, 2006).

Norway has been the world's principal producer and supplier of olivine. Other producers include Australia, Austria, Brazil, China, Greece, Italy, Japan, the Republic of Korea, Mexico, Spain, Taiwan, Turkey, and the United States. Roberts (2008) estimated that total world production of olivine in 2008 was 8.4 Mt, although the total was likely smaller in 2011 with mine closures, particularly in Greenland and Norway, which resulted from the global economic downturn in 2008–09.

European Union.—Austria-based RHI AG acquired seawater magnesia producers Premier Periclase Ltd. in Drogheda, County Louth, Ireland, and SMA Mineral Magnesia AS in Porsgrunn, Norway. The plant in Ireland was expected to provide a high-purity source of dead-burned magnesia to RHI, and caustic-calcined magnesia production from the Norwegian plant would supply feedstock for a new 80,000-t/yr fused magnesia plant that was to be constructed at Porsgrunn. RHI also announced plans to increase dead-burned magnesia capacity at its Turkish subsidiary Magnesit AS by mid-2012 (O' Driscoll, 2011d, e).

Australia.—Queensland Magnesia Pty. Ltd. (QMAG) purchased and planned to refurbish Cement Australia Pty. Ltd.'s mothballed cement plant to produce 100,000 t/yr of caustic-calcined magnesia. The plant was expected to come onstream by 2013 and would increase QMAG's total magnesia production capacity to 400,000 t/yr. The acquisition, which included the land, plant, and equipment, refurbishing, and recommissioning of the plant, was estimated to cost $20.8 million. The cement plant had been on care-and-maintenance status since 2009 (O'Driscoll, 2011c).

Canada.—In July, Karnalyte Resources Inc. announced that it would conduct a National Instrument 43–101 (NI 43–101)-compliant prefeasibility study for magnesium chloride process streams at the same facility that it intended to construct for potash production near Wynyard, Saskatchewan, and expected the study to be completed by yearend. (NI 43–101 is a national instrument for the standards of disclosure for mineral projects within Canada. The instrument is a codified set of rules and guidelines for reporting and displaying information related to mineral properties owned by, or explored by, companies which report these results on stock exchanges within Canada.) Karnalyte intended to develop a carnallite-sylvite mineral deposit by solution mining to produce 500,000 t/yr of potash. A 2010 preliminary assessment reported that the deposit had an indicated mineral resource of about 50.2 Mt of magnesium chloride ranging from 3% to 15% (Karnalyte Resources Inc., 2011).

China.—China set its export quota for caustic-calcined and dead-burned magnesia at 1.23 Mt for 2012. This was the same as the 2011 quota (O'Driscoll and Roberts, 2012).

Netherlands.—Nedmag Industries Mining and Manufacturing B.V. planned to drill a new well to recover magnesium salts and increase dead-burned magnesia production capacity to 200,000 t/yr from 160,000 t/yr at its Veendam, operation by 2013. The facility also had the capacity to produce 100,000 t/yr of magnesium chloride, 5,000 t/yr of caustic-calcined magnesia, and 5,000 t/yr of magnesium hydroxide (O'Driscoll, 2011b).

Norway.—In May, Sibelco restarted olivine production at its Raubergvik Mine that had been closed since January 2009 because of market conditions. Sibelco planned an initial production of 400,000 t, which was expected to be exported to the United States. The company also reopened the Grubse Mine at its principal mining site in Åheim, but its Bryggja underground mine and plant, which were closed in October 2009, remained on care-and-maintenance status (Roberts, 2011).

Russia.—In November, Magnezit Group completed a new magnesia processing line at its refractories plant in Satka, Chelyabinsk. The new milling line included a ball mill, bag filter, and ore transportation equipment. The company also planned to complete installation of new briquetting equipment and begin construction of an 80,000-t/yr high-temperature

shaft kiln and 100,000-t/yr multiple-hearth furnace by yearend. Once all the equipment is installed, the plant's capacity for dead-burned magnesia would increase to 130,000 t/yr (Magnezit Group, 2011a). The company also was developing a new magnesite mining complex in Siberia, which would use magnesite from the Talsk deposit as feedstock. The first stage of the plant was expected to be completed in 2012, with full commercial production scheduled for 2015. At full capacity, the plant could produce 200,000 t/yr of caustic-calcined magnesia and 150,000 t/yr of fused magnesia (Magnezit Group, 2011b).

Russian Mining Chemical Co. LLC reportedly completed construction of its new brucite processing plant near Vyazma in August. The new facility, which was built next to the company's existing processing plant, would allow Russian Mining to increase production of flame retardants for domestic supply and major markets in Europe and the United States. The company mined brucite from the Kuldur deposit in the Jewish Autonomous Oblast in the Far Eastern economic region. No capacity information was available (Composites World, 2011).

Saudi Arabia.—In April, Saudi Arabian Mining Co. (Ma'aden) opened its new magnesia plant in Al-Madinah Al-Munawarah with production capacities of 39,000 t/yr of caustic-calcined magnesia and 32,000 t/yr of dead-burned magnesia. Ma'aden planned to market its production to domestic and export markets and began shipping its products to Europe in May (O'Driscoll, 2011f).

Serbia.—In March, Magnohrom d.o.o. restarted production of dead-burned magnesia from a 100-metric-ton-per-day rotary kiln. The company had not produced magnesite since 2007 and planned to export 95% of the dead-burned magnesia. In addition, Magnohrom also planned to open a magnesite mine in Zlatibor (O'Driscoll, 2011a).

Turkey.—The leading magnesia producer in Turkey, Kümaş Kütahya Manyezit İşletmeleri A.Ş., acquired Bommag Manyezit Sanayi ve Ticaret Ltd. Si.'s magnesite mine, reserves, and magnesia plant in western Turkey and planned to expand caustic-calcined and dead-burned magnesia capacities at the facility, which were 20,000 t/yr and 25,000 t/yr, respectively. Kümaş also planned to double the fused magnesia production capacity to 26,000 t/yr at its Kutahya facility. Kümaş was subsequently put up for sale through a bidding process, and in January 2012, Kümaş was awarded to Kobin Madencilik İnşaat ve Ticaret AŞ for $285.5 million (O'Driscoll, 2012a, b).

Akdeniz Minerals Kaynaklari A.Ş. (a subsidiary of Grecian Magnesite S.A.) was installing a new rotary furnace intended to double the caustic-calcined magnesia production capacity at its plant in the Eskisehir area to 32,000 t/yr in early 2012 (O'Driscoll, 2011a).

Outlook

According to the World Steel Association (2012b), world crude steel production reached a record 1.53 billion metric tons in 2011, which was an increase of 6.8% compared with that of 2010. Production in the United States increased by about 7% compared with production in 2010, indicating an ongoing improvement in the U.S. economy. Production increased in the top 10 steel-producing nations, with the exception of Japan, where production decreased by 1.8%. Of the top 10 steel-producing countries, the largest percentage increases in production were in Turkey (17%) and the Republic of Korea (16.2%). China continued to be the leading steel-producing nation, accounting for 45.5% of the global total in 2011, which was an 8.9% increase from production in 2010. In the first 4 months of 2012, world steel production continued to increase, although production was only 0.7% more that that in the comparable period of 2011. The increase in China's production, however, was higher at 1.9% (World Steel Association, 2012a). A sustained increase in steel production in China could lead to more internal consumption of magnesia-based refractories, which could result in less magnesia available for the export market, although China has extensive magnesite deposits that could be developed. In addition, China's export licensing and export quota requirements for magnesite may undergo scrutiny of the World Trade Organization, as has taken place for other minerals and metals.

Because caustic-calcined magnesia is used in a wide variety of applications, the economic downturn did not affect consumption as significantly as consumption of refractory magnesia, which was directly tied to the performance of the U.S. steel industry. Magnesium hydroxide continued to be used mainly in environmental applications, but interest in magnesium hydroxide flame retardants also was increasing. Replacement of halogenated flame retardants in some plastics, for which there is environmental concern about corrosiveness and toxicity of smoke and other emission products, with magnesium hydroxide could increase its use.

Carbon sequestration is gaining world attention as a method to reduce greenhouse gas emissions into the atmosphere. Magnesium-based minerals, particularly brucite and olivine, are being investigated as minerals that are naturally capable of sequestering carbon dioxide that is emitted from fossil fuel burning or other human activity and transforming the gas into a geologically stable carbonate where it is unreactive. If this technology is developed commercially, it could represent a new market for these minerals.

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TABLE 1
SALIENT MAGNESIUM COMPOUND STATISTICS[1]

(Thousand metric tons and thousand dollars)

	2007	2008	2009	2010	2011
United States:					
Caustic-calcined and specified magnesias:					
Shipped by producers:[2]					
Quantity	125	170	147	162	155
Value	41,100	52,700	42,200	47,000	48,800
Exports[3]	4	1	1	(4)	(4)
Imports for consumption[3]	134	167	126	127	111
Refractory magnesia:					
Shipped by producers:					
Quantity	W	W	W	W	W
Value	W	W	W	W	W
Exports	22	22	8	9	18
Imports for consumption	437	386	151	323	384
World, production of magnesite	20,300	21,400 r	18,200	20,000 r	20,500 e

eEstimated. rRevised. W Withheld to avoid disclosing company proprietary data.

[1]Data are rounded to no more than three significant digits.

[2]Includes magnesia used by producers.

[3]Caustic-calcined magnesia only.

[4]Less than ½ unit.

TABLE 2
U.S. MAGNESIUM COMPOUND PRODUCERS, BY RAW MATERIAL SOURCE, LOCATION, AND PRODUCTION CAPACITY, IN 2011[1]

(Metric tons, MgO equivalent)

Raw material source and producing company	Location	Capacity	Products
Magnesite, Premier Magnesia LLC	Gabbs, NV	140,000	Caustic-calcined magnesia.
Lake brines:			
Great Salt Lake Minerals Corp.	Ogden, UT	185,000	Magnesium chloride and magnesium chloride brines.
Intrepid Wendover-Potash LLC	Wendover, UT	45,000	Magnesium chloride brines.
Well brines, Martin Marietta Magnesia Specialties LLC[2]	Manistee, MI	314,000	Caustic-calcined magnesia, dead-burned magnesia, and magnesium hydroxide.
Seawater:			
Premier Magnesia LLC	Port St. Joe, FL	107,000	Caustic-calcined magnesia and magnesium hydroxide.
South Bay Salt Works	Chula Vista, CA	3,000	Magnesium chloride brines.
SPI Pharma Inc.	Lewes, DE	5,000	Magnesium hydroxide.
Total		799,000	

[1]Data are rounded to no more than three significant digits; may not add to total shown.

[2]In addition to its Michigan plant, Martin Marietta owned a 15,000-metric-ton-per-year-capacity magnesium hydroxide plant in Lenoir City, TN, which used imported magnesite as a raw material.

TABLE 3
U.S. MAGNESIUM COMPOUNDS SHIPPED AND USED[1]

	2010		2011	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Caustic-calcined and specified (USP and technical) magnesias[2]	162,000	$47,000	155,000	$48,800
Magnesium hydroxide [100% $Mg(OH)_2$][2]	171,000	107,000	199,000	120,000
Magnesium sulfate, anhydrous and hydrous	47,400	20,600	50,600	22,500
Refractory magnesia	W	W	W	W

W Withheld to avoid disclosing company proprietary data.

[1]Data are rounded to no more than three significant digits.

[2]Excludes material produced as an intermediate step in the manufacture of other magnesium compounds.

TABLE 4
U.S. EXPORTS OF CRUDE AND PROCESSED MAGNESITE, BY COUNTRY[1]

Material and country	2010 Quantity (metric tons)	2010 Value (thousands)	2011 Quantity (metric tons)	2011 Value (thousands)
Caustic-calcined magnesia:				
China	94	$57	91	$47
India	27	21	25	16
Mexico	134	76	4	15
Peru	18	9	42	21
Other	5 r	2 r	4	13
Total	278	165	166	112
Dead-burned and fused magnesia:				
Brazil	32	28	277	241
Canada	4,380	2,780	4,110	2,780
Germany	540	502	822	927
Korea, Republic of	545	452	541	463
Mexico	217	380	166	376
Saudi Arabia	(2)	3	873	462
South Africa	839	461	9,170	5,550
Taiwan	155	169	48	54
Turkey	40	46	118	128
Venezuela	1,020	592	783	385
Other	888 r	1,130 r	1,020	1,290
Total	8,650	6,550	17,900	12,700
Other magnesia:				
Brazil	1,420	1,520	954	1,100
Canada	2,730	3,000	2,850	3,150
China	476	717	465	956
France	1,580	1,450	672	657
Germany	934	903	1,290	1,080
India	576	544	642	728
Korea, Republic of	767	685	429	393
Mexico	590	1,040	782	713
Netherlands	2,610	2,040	1,310	996
Spain	615	562	629	569
Taiwan	1,950	1,650	1,960	1,790
Venezuela	33	61	661	472
Other	3,790 r	6,110 r	3,080	4,800
Total	18,100	20,300	15,700	17,400
Crude magnesite:				
Argentina	382	50	835	109
Australia	34	4	879	161
Canada	2,340	414	1,540	251
Egypt	736	97	307	40
Germany	792	104	208	27
Iceland	407	48	1,820	264
Italy	614	80	--	--
Panama	--	--	1,270	167
Saudi Arabia	963	126	--	--
Thailand	42	5	876	115
Trinidad and Tobago	--	--	783	103
United Kingdom	337	44	412	56
Venezuela	353	46	8,580	1,130
Other	1,920 r	296 r	892	123
Total	8,920	1,310	18,400	2,540

rRevised. -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 5
U.S. EXPORTS OF MAGNESIUM COMPOUNDS[1]

Material	2010 Quantity (metric tons)	2010 Value (thousands)	2011 Quantity (metric tons)	2011 Value (thousands)	Principal destinations in 2011
Magnesium chloride, anhydrous and other	8,030	$6,260	10,100	$6,520	Canada, 89%.
Magnesium hydroxide and peroxide	16,700	13,800	18,500	14,900	Canada, 57%; Mexico, 9%; United Kingdom, 9%.
Magnesium sulfate, natural kieserite and epsom salts	255	265	654	1,820	Mexico, 85%; Saudi Arabia, 9%.
Magnesium sulfate, other	9,920	4,810	13,300	5,030	Canada, 97%.

[1]Data are rounded to no more than three significant digits.

Source: U.S. Census Bureau.

TABLE 6

U.S. IMPORTS FOR CONSUMPTION OF CRUDE AND PROCESSED MAGNESITE, BY COUNTRY[1]

Material and country	2010 Quantity (metric tons)	2010 Value (thousands)	2011 Quantity (metric tons)	2011 Value (thousands)
Caustic-calcined magnesia:				
Australia	14,900	$4,130	13,200	$3,930
Brazil	11,800	3,270	--	--
Canada	30,400	13,100	39,900	17,700
China	55,000	14,000	56,500	17,900
Hong Kong	7,930	2,530	--	--
Spain	3,800	1,220	--	--
Turkey	2,110	1,290	473	316
United Kingdom	168	179	--	--
Other	1,280	588	950	482
Total	127,000	40,300	111,000	40,300
Dead-burned and fused magnesia:				
Australia	42,300	17,600	26,500	16,100
Austria	2,920	1,250	--	--
Brazil	26,600	8,100	27,700	15,100
China	213,000	99,000	220,000	136,000
Germany	3,110	2,630	8	48
Greece	6,760	2,580	4,700	2,540
Israel	4,140	11,900	3,370	11,200
Japan	2,210	4,900	2,280	9,630
Mexico	6,710	3,750	1,630	1,190
Netherlands	127	78	3,060	2,080
Russia	10,800	3,970	43,100	16,600
Spain	3,950	1,290	8,130	2,430
Turkey	345	172	4,530	2,270
Ukraine	19	3,220	38,100	17,000
Other	154 r	488 r	210	1,560
Total	323,000	161,000	384,000	234,000
Other magnesia:				
Brazil	646	3,310	1,220	7,130
Canada	564	328	227	76
China	427	499	5,020	924
Israel	558	1,310	1,190	3,160
Japan	1,000	2,570	982	3,040
Mexico	4,090	3,450	6,310	5,310
Slovakia	1,670	549	1,970	775
Spain	2,740	1,310	11,600	4,510
Other	265	1,220	257	830
Total	12,000	14,500	28,700	25,700
Crude magnesite:				
Brazil	516	414	360	416
China	9,980	2,130	187	235
France	240	219	60	73
Hong Kong	8,400	2,550	8,210	2,620
Israel	1,540	1,380	1,220	1,120
Japan	254	482	172	242
United Kingdom	1,130	1,010	990	882
Other	350	238	390	207
Total	22,400	8,420	11,600	5,790

rRevised. -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 7
U.S. IMPORTS FOR CONSUMPTION OF MAGNESIUM COMPOUNDS[1]

	2010		2011		
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Principal sources in 2011
Magnesium chloride, anhydrous and other	87,900	$24,100	75,600	$22,100	Israel, 71%; Netherlands, 26%.
Magnesium hydroxide and peroxide	5,500	13,900	6,110	17,800	Austria, 34%; Israel, 28%; Japan, 12%.
Magnesium sulfate, natural epsom salts	3,340	780	2,400	819	China, 97%.
Magnesium sulfate, natural kieserite	5,900	134	15,200	302	Germany, 100%.
Magnesium sulfate, other	19,000	10,100	20,100	11,900	China, 41%; Germany, 24%; Mexico, 19%.

[1]Data are rounded to no more than three significant digits.

Source: U.S. Census Bureau.

TABLE 8
WORLD MAGNESIUM COMPOUNDS ANNUAL PRODUCTION CAPACITY, DECEMBER 31, 2011[1, 2]

(Thousand metric tons, MgO equivalent)

	Raw material				
	Magnesite		Seawater or brines		
Country	Caustic-calcined	Dead-burned	Caustic-calcined	Dead-burned	Total
Australia	218	110	--	--	328
Austria	76	325	--	--	401
Brazil	96	320	12	--	428
Canada	100	--	--	--	100
China	1,440	2,740	--	--	4,180
France	--	--	30	--	30
Greece	90	110	--	--	200
India	20	202	--	--	222
Iran	25	40	--	--	65
Ireland	--	--	--	90	90
Israel	--	--	10	60	70
Italy	25	--	--	--	25
Japan	--	--	50	70	120
Jordan	--	--	10	50	60
Korea, North	25	100	--	--	125
Korea, Republic of	--	--	--	40	40
Mexico	--	--	15	95	110
Netherlands	--	--	10	165	175
Norway	--	--	30	--	30
Poland	--	10	--	--	10
Russia	150	2,400	--	--	2,550
Saudi Arabia	39	32	--	--	71
Serbia	--	35	--	--	35
Slovakia	--	465	--	--	465
South Africa	12	--	--	--	12
Spain	150	70	--	--	220
Turkey	50	434	--	--	484
Ukraine	--	120	20	80	220
United States	140	--	191	195	526
Total	2,660	7,510	378	845	11,400

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes capacity at operating plants, as well as at plants on standby basis.

TABLE 9
MAGNESITE: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Metric tons)

Country	2007	2008	2009	2010	2011[e]
Australia	447,000	126,000	344,000	275,000 [r]	300,000
Austria, crude	811,556	837,476	544,716	757,063 [r]	760,000
Brazil, beneficiated	399,314	421,333	409,909 [r]	483,882 [r]	484,000
Canada[e, 3]	140,000	140,000	140,000	150,000	150,000
China[e]	14,000,000	15,600,000	13,000,000	14,000,000	14,500,000
Colombia[e]	42,000	38,000	--	--	--
Greece, crude	351,414	361,165	250,234	300,000	300,000
Guatemala	7,612	11,758	17,247	17,500	17,000
India[e]	360,000	350,000	340,000	345,000 [r]	350,000
Iran[e]	112,229 [4]	115,987 [4]	115,000	115,000	115,000
Korea, North[e]	55,000	150,000	150,000	150,000	150,000
Pakistan	2,370	3,500 [r, e]	4,000 [r]	4,000 [r, e]	3,800
Poland, concentrate	65,000	60,000 [e]	47,000	50,000 [e]	50,000
Russia[e]	1,200,000	1,200,000	1,000,000	1,200,000	1,200,000
Serbia, crude[e]	-- [r]	-- [r]	-- [r]	-- [r]	--
Slovakia, concentrate	957,000	807,000	478,000	650,100	600,000
South Africa	80,700	83,900	47,600 [r, 4]	58,000 [r]	70,000
Spain[e]	461,901 [4]	460,000	460,000	460,000	460,000
Turkey, run-of-mine	802,406	677,784	861,180	1,000,000 [e]	1,000,000
United States	W	W	W	W	W
Zimbabwe	1,814	2,549	449	5,000 [r, e]	5,000
Total	20,300,000	21,400,000 [r]	18,200,000	20,000,000 [r]	20,500,000

[e]Estimated. [r]Revised. W Withheld to avoid disclosing company proprietary data; not included in "Total." -- Zero.

[1]World totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Figures represent crude salable magnesite. In addition to the countries listed, Bulgaria produced magnesite, but output is not reported quantitatively, and available information is inadequate for formation of reliable estimates of output levels. Table includes data available through May 14, 2012.

[3]Magnesitic dolomite and brucite.

[4]Reported figure.