

Mineral Industry Surveys

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FLUORSPAR IN THE FIRST QUARTER 2020

Fluorspar imports in the first quarter of 2020 were 94,400 metric tons (t), 78,600 t of which were acid grade and 15,800 t of which were metallurgical grade (fig. 1, table 1). The leading sources of acid-grade imports were Mexico (72%), Canada (14%), and South Africa (13%); Mexico accounted for nearly 100% of metallurgical-grade imports. Acid-grade imports decreased by 11% compared with imports in the previous quarter but increased slightly compared with those in the first quarter of 2019. Metallurgical-grade imports increased by 90% compared with imports in the previous quarter but decreased by 35% compared with those in the first quarter of 2019.

In the first quarter of 2020, imports of other fluorine-containing materials produced directly from fluorspar were 32,500 t for hydrofluoric acid, 5,020 t for aluminum fluoride, and 4,890 t for cryolite (table 1). Mexico was the leading supplier of hydrofluoric acid accounting for 91% of imports in the first quarter of 2020, comparable with import quantities in previous quarters (table 3). Exports of acid- and metallurgical-

grade fluorspar, aluminum fluoride, and cryolite were likely re-exports as there is no domestic production (table 1).

The quarterly average unit value of acid-grade imports from Canada and Mexico increased by 56% and 10%, respectively, to \$405 per metric ton and \$306 per metric ton compared with the 2019 annual average unit value. The quarterly average unit value of acid-grade imports from South Africa decreased by 44% to \$250 per metric ton. The quarterly average value of metallurgical-grade imports from Mexico increased slightly to \$281 per metric ton, compared with the 2019 annual average unit value (table 2).

The following is a discussion of prices from leading-exporting countries in the first quarter of 2020 according to Fastmarkets IM. The price of acid-grade fluorspar from China was \$420 to \$470 per metric ton, a 5% increase compared with the fourth quarter of 2019, but an 8% decrease compared with the first quarter of 2019 (table 4). The price of acid-grade fluorspar from Mexico was \$350 to \$420 per metric ton, a 7% decrease compared with the fourth quarter of 2019 and a 9%

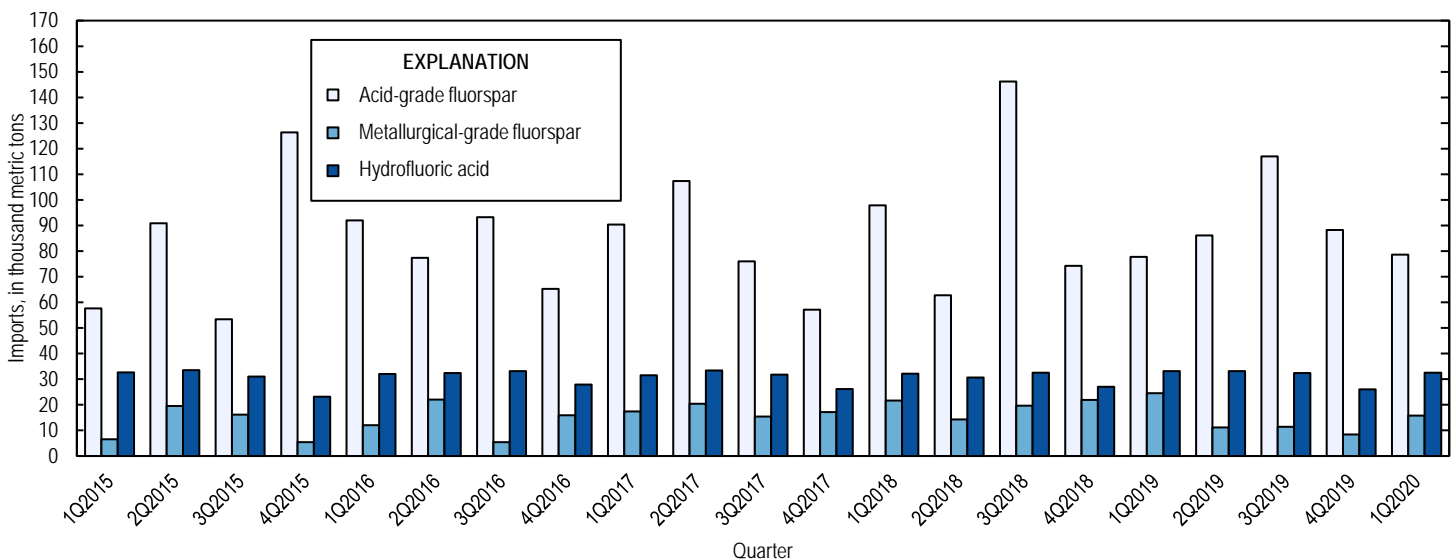


Figure 1. Acid-grade fluorspar, metallurgical-grade fluorspar, and hydrofluoric acid imports from the first quarter of 2015 through the first quarter of 2020. Source: U.S. Census Bureau.

decrease compared with the first quarter of 2019. The price of acid-grade fluorspar from South Africa was \$350 to \$410 per metric ton, an 11% decrease compared with the fourth quarter of 2019 and an 18% decrease compared with the first quarter of 2019. The price of metallurgical-grade fluorspar from Mexico remained unchanged at \$280 to \$320 per metric ton.

Fluorochemical News

The Republic of Korea's Ministry of Trade, Industry, and Energy announced that Soulbrain Co., Ltd., a chemical company based in Gyeonggi Province, had developed the capability to manufacture enough high-purity hydrofluoric acid (HF) to meet most of the needs of its domestic semiconductor manufacturing industry. The country had been working to reduce its dependence on imported materials needed for the manufacture of semiconductors and displays after Japan imposed export restrictions on high-purity HF, fluorinated polyimides, and photoresists in 2019 (Kyoung-son, 2020).

The U.S. Environmental Protection Agency released an update on its 2019 Per- and Polyfluoroalkyl Substances (PFAS) Action Plan. The agency highlighted several actions it had taken in the past year to address PFAS contamination including, 1) issuing a preliminary determination to regulate perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) under the Safe Drinking Water Act, 2) issuing a supplemental proposal to ensure that the manufacture or import of new uses of long-chain PFAS in surface coatings

would require review under the Toxic Substances Control Act of 1976, 3) validating new methods to accurately test for 11 PFAS in drinking water, 4) issuing interim guidance for addressing PFOA- and (or) PFOS-contaminated groundwater in federal clean-up programs including the Comprehensive Environmental Response, Compensation, and Liability Act and the Resource Conservation and Recovery Act, 5) issuing an advanced notice of rulemaking that would allow public input on adding PFAS to the Toxic Release Inventory toxic chemicals list, and 6) making available \$4.8 million in funding for new research on managing PFAS in agriculture (U.S. Environmental Protection Agency, 2020).

References Cited

- Kyoung-son, Song, 2020, Soulbrain is able to make super pure etching gas: Seoul, Republic of Korea, Korea JoongAng Daily, January 3. (Accessed July 10, 2020, at <https://koreajoongangdaily.joins.com/news/article/article.aspx?aid=3072206>.)
- U.S. Environmental Protection Agency, 2020, EPA releases PFAS action plan—Program update: U.S. Environmental Protection Agency press release, February 20. (Accessed July 10, 2020, at <https://www.epa.gov/newsreleases/epa-releases-pfas-action-plan-program-update-0>.)

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TABLE 1
SALIENT FLUORSPAR STATISTICS¹

(Metric tons, unless otherwise specified)

	2019				1st quarter– 4th quarter	2020 1st quarter
	1st quarter	2d quarter	3d quarter	4th quarter		
Production, fluorspar	--	--	--	--	--	--
Imports for consumption: ²						
Fluorspar:						
Acid grade, more than 97% calcium fluoride	77,700	86,100	117,000	88,300	369,000	78,600
Metallurgical grade, less than 97% calcium fluoride	24,500	11,100	11,400	8,360	55,400	15,800
Total	102,000	97,200	128,000	96,600	425,000	94,400
Hydrofluoric acid	33,100	33,100	32,400	26,000	124,000	32,500
Aluminum fluoride	7,050	12,900	8,460	8,940	37,300	5,020
Cryolite	5,970	5,260	4,390	5,130	20,700	4,890
Exports: ²						
Fluorspar:						
Acid grade, more than 97% calcium fluoride	125	796	522	438	1,880	504
Metallurgical grade, less than 97% calcium fluoride	1,740	929	1,180	1,860	5,720	2,480
Total	1,870	1,730	1,700	2,300	7,600	2,990
Hydrofluoric acid	4,800	4,610	3,540	3,290	16,200	2,920
Aluminum fluoride	89	159	77	64	390	6
Cryolite	2,850	2,360	1,880	1,450	8,530	1,380
Apparent consumption, fluorspar: ³						
Acid grade, more than 97% calcium fluoride	77,600	85,300	117,000	87,800	367,000	78,100
Metallurgical grade, less than 97% calcium fluoride	22,700	10,200	10,200	6,500	49,600	13,400
Total	100,000	95,500	127,000	94,300	417,000	91,400

-- Zero.

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

²Source: U.S. Census Bureau.

³Imports minus exports.

TABLE 2
U.S. IMPORTS FOR CONSUMPTION OF FLUORSPAR, BY COUNTRY AND VALUE^{1,2,3}

	2019								2020			
	1st quarter		2d quarter		3d quarter		4th quarter		1st quarter–4th quarter		1st quarter	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Acid grade, more than 97% calcium fluoride:												
Canada	4,810	\$1,250	--	--	--	--	--	--	4,810	\$1,250	10,600	\$4,310
China	--	--	9,960	\$4,760	18,300	\$8,910	23,600	\$10,300	51,900	23,900	--	--
France	--	--	38	21	--	--	--	--	38	21	--	--
Germany	452	77	--	--	--	--	38	30	490	107	175	103
Japan	--	--	--	--	566	312	316	163	882	476	939	486
Mexico	57,300	15,500	55,900	15,100	70,000	20,300	47,700	13,600	231,000	64,600	56,600	17,400
Mongolia	57	37	168	104	57	33	517	310	799	484	134	81
Netherlands	--	--	--	--	6,560	2,600	--	--	6,560	2,600	--	--
South Africa	--	--	9,990	4,500	--	--	--	--	9,990	4,500	10,000	2,510
Spain	1	6	10,100	4,640	--	--	--	--	10,100	4,640	--	--
United Kingdom	--	--	4	12	2	6	80	5	86	23	3	15
Vietnam	15,100	4,260	--	--	21,500	6,500	16,000	4,040	52,600	14,800	--	--
Total	77,700	21,100	86,100	29,200	117,000	38,700	88,300	28,400	369,000	117,000	78,600	24,900
Metallurgical grade, less than 97% calcium fluoride:												
China	212	133	89	58	415	248	14	9	730	449	49	35
Germany	--	--	6	4	--	--	--	--	6	4	--	--
India	21	12	36	21	36	21	--	--	93	54	--	--
Mexico	23,900	5,640	11,000	3,320	10,900	3,300	8,350	2,540	54,200	14,800	15,800	4,440
Mongolia	336	198	--	--	--	--	--	--	336	198	--	--
Netherlands	1	4	--	--	--	--	--	--	1	4	--	--
United Kingdom	--	--	--	--	--	--	--	--	--	--	2	7
Total	24,500	5,990	11,100	3,400	11,400	3,570	8,360	2,540	55,400	15,500	15,800	4,480
Grand total	102,000	27,100	97,200	32,600	128,000	42,300	96,600	31,000	425,000	133,000	94,400	29,300

-- Zero.

¹Imports for consumption include imports of immediate entry and warehouse withdrawals.

²Data are rounded to no more than three significant digits; may not add to totals shown.

³Cost, insurance, and freight at U.S. ports.

Source: U.S. Census Bureau.

TABLE 3
U.S. IMPORTS FOR CONSUMPTION OF HYDROFLUORIC ACID^{1,2}

	2019										2020	
	1st quarter		2d quarter		3d quarter		4th quarter		1st quarter–4th quarter		1st quarter	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Belgium	18	\$42	--	--	--	--	--	--	18	\$42	--	--
Canada	63	210	44	\$154	129	\$242	73	\$165	309	771	83	\$192
China	431	592	892	1,110	685	778	514	606	2,520	3,080	506	600
Germany	271	634	238	605	338	802	338	782	1,190	2,820	287	696
India	37	49	179	179	89	107	231	312	536	648	354	444
Ireland	--	--	--	--	--	--	--	--	--	--	18	50
Israel	--	--	--	--	15	17	--	--	15	17	--	--
Japan	270	682	589	1,480	642	1,570	605	1,480	2,110	5,210	629	1,510
Korea, Republic of	674	1,310	692	1,470	339	891	192	604	1,900	4,270	317	1,030
Mexico	30,600	46,500	29,600	46,200	29,500	49,800	23,300	37,000	113,000	179,000	29,500	46,100
Netherlands	--	--	18	23	--	--	--	--	18	23	--	--
Singapore	129	407	32	102	64	204	64	206	290	920	98	274
Spain	493	872	591	936	368	525	419	593	1,870	2,930	339	561
Taiwan	56	158	175	475	182	478	226	598	640	1,710	396	955
Total	33,100	51,400	33,100	52,700	32,400	55,400	26,000	42,300	124,000	202,000	32,500	52,400

-- Zero.

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

²Cost, insurance, and freight at U.S. ports.

Source: U.S. Census Bureau.

TABLE 4
END OF QUARTER FLUORSPAR PRICES

(Dollars per metric ton)

	2019				2020
	1st quarter	2d quarter	3d quarter	4th quarter	1st quarter
Acid grade, more than 97% calcium fluoride:					
Dry basis, cost, insurance, and freight, Gulf port, filtercake	260–270	NA	NA	NA	NA
China, free on board (f.o.b.) China, wet filtercake	450–515	460–520	430–500	400–450	420–470
Mexican, f.o.b. Tampico, wet filtercake ¹	400–450	400–450	400–450	380–450	350–420
South Africa, f.o.b. Durban, filtercake	440–490	440–490	440–490	400–450	350–410
Metallurgical grade, minimum 85% calcium fluoride, Mexican, f.o.b. Tampico	280–320	280–320	280–320	280–320	280–320

NA Not available.

Source: Fastmarkets IM (London).