

Barite

Michel A. Boucher

The author was with the Minerals and Metals Sector, Natural Resources Canada. Enquiries should be directed to Bruce Boyd at tel. (613) 992-8179.

Barite (BaSO_4 , or barium sulphate) is the principal source of the element barium. Pure barite contains 58.8% barium or 65.7% barium oxide. Barite in most commercial deposits occurs as irregular masses and in laminated to massive beds of fine crystallinity. The mineral occurs in many colours such as yellow, brown and pink, although shades of white to dark grey are most common in commercial deposits. Barite is heavy with a specific gravity of 4.5, but is soft with a hardness of 2.5 to 3.5 on the Mohs scale. Barite is relatively insoluble in water and acid, and therefore can be used as a chemically inert material.

WORLD PRODUCTION

World production of barite in 1996 (the latest year for which statistics are available) was estimated by the U.S. Geological Survey at 4.46 Mt. The major producers were China (1 500 000 t), the United States (662 000 t), India (500 000 t), Morocco (265 000 t), Kazakstan (250 000 t), Mexico (250 000 t), and Germany, Iran and Turkey with production of about 150 000 t each.

In the United States, most production (450 000-500 000 t) comes from the state of Nevada.

CANADIAN PRODUCTION AND TRADE

Production

Production shipments of barite in 1997 are estimated at close to 103 000 t valued at \$11 524 000, equating to \$112/t. In 1996, shipments were close to 58 000 t valued at \$6 498 000. The increase is the result of the opening of a new mine in British Columbia.

In 1997, there were four producers of barite in Canada: Nystone Chemicals Ltd. in Nova Scotia (owned by EZ-EM Canada Inc., which in turn is

owned by EZ-EM of New York); Extender Minerals of Canada Ltd. in Ontario; and Highwood Resources Ltd. and Fireside Minerals Ltd. in British Columbia. Fireside is a new producer that started production during 1997. Highwood is the largest producer in terms of volume, followed by Fireside, Extender and Nystone.

Nystone operates an open-pit mine at Brookfield, Nova Scotia, where the ore is crushed and screened, and a processing plant at Debert, Nova Scotia. The company produces a high-value pharmaceutical-grade barite, with a minimum purity of 97.5%, that sells for over \$1200/t.

Extender operates an underground (brown barite vein deposit-type) mine and processing plant close to Matachewan near Kirkland Lake, Ontario. The product grades 93-97% barite, and is used in paints and plastics, as rubber foam filler, and in tiles and brake linings.

Highwood operates an underground mine at Parson, British Columbia, and a processing plant at Lethbridge, Alberta. Its product is used mainly in drilling muds, but also in paints and plastics.

Fireside operates a high-grade white barite mine in British Columbia near the Yukon border, and a processing plant at Watson Lake, Yukon. The barite produced is suitable for filler applications or for use in drilling mud.

Therapex of Montréal, which is owned by EZ-EM Canada Inc., produces high-purity barite for pharmaceutical use.

Trade

Imports of barite into Canada in 1997 totalled 20 889 t valued at \$2 555 000, compared with 15 472 t valued at \$1 776 000 in 1996. More than 90% of the imports came from the United States.

Exports of barite in 1997 were 21 308 t valued at \$5 907 000, compared with 15 352 t valued at \$5 286 000 in 1996. More than 90% of the exports went to the United States.

OPPORTUNITIES

Canada does not produce barite chemicals such as barium carbonate, barium oxide, barium chloride and barium nitrate. These products command much higher prices than most barite concentrates (see imports in Table 1). However, Canada produces coal, sodium carbonate, hydrochloric acid and nitric acid. These products are the raw materials that are used to produce most barite chemicals for use in applications such as optical glass, welding flux compounds, metallurgy, pyrotechnics, etc.

Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to Chapter 65. (2) Information in this review was current as of March 31, 1998.

TARIFFS

Item No.	Description	Canada			United States
		MFN	GPT	USA	Canada
2511.10	Natural barium sulphate (barytes)	4.5%	Free	Free	Free
2511.20	Natural barium carbonate (witherite)	Free	Free	Free	Free
2816.30	Barium oxide, hydroxide and peroxide	Free	Free	Free	Free
2827.38	Barium chloride	4%	Free	Free	Free
2833.27	Barium sulphate	Free	Free	Free	Free
2834.29	Other nitrates	Free	Free	Free	Free
2836.60	Barium carbonate	Free	Free	Free	Free

Sources: Customs Tariff, effective January 1998, Revenue Canada; Harmonized Tariff Schedule of the United States, 1998.

TABLE 1. CANADA, BARITE PRODUCTION AND TRADE, 1995-97, AND CONSUMPTION, 1993-96

Item No.	1995		1996		1997P		
	(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)	
PRODUCTION (shipments)	60 662	6 556	57 967	6 498	102 800	11 524	
IMPORTS							
2511.10	Natural barium sulphate (barytes)						
	United States	15 792	1 459	13 626	1 487	19 428	2 214
	Netherlands	805	254	1 604	266	1 000	233
	United Kingdom	—	—	—	—	390	82
	Other countries	20	1	242	23	71	26
	Total	16 617	1 714	15 472	1 776	20 889	2 555
2511.20	Natural barium carbonate (witherite)						
	United States	15	8	7	3	481	216
	People's Republic of China	36	10	149	87	485	212
	Other countries	—	—	3	1	6	1
	Total	51	19	159	91	972	429
2816.30	Barium oxide, hydroxide and peroxide						
	People's Republic of China	—	—	—	—	772	565
	Germany	156	140	105	94	200	178
	Italy	155	139	168	146	171	147
	Other countries	55	51	39	36	37	28
	Total	366	330	312	277	1 179	920
2827.38	Barium chloride						
	People's Republic of China	365	192	804	311	617	272
	United States	23	40	140	149	92	108
	Other countries	7	20	38	38	61	67
	Total	395	254	983	501	771	452
2833.27	Barium sulphate						
	Germany	293	298	934	1 111	1 771	2 101
	Italy	138	185	249	325	259	385
	Other countries	203	107	344	283	506	325
	Total	634	591	1 528	1 722	2 535	2 812
2834.29	Other nitrates						
	United States	2 224	4 914	1 962	3 191	2 116	3 269
	People's Republic of China	953	865	1 004	1 045	2 675	2 784
	Norway	570	854	831	1 245	1 739	2 739
	Other countries	1 145	1 173	1 637	1 898	571	678
	Total	4 892	7 817	5 434	7 387	7 102	9 478
2836.60	Barium carbonate						
	United States	306	183	834	500	2 717	1 077
	People's Republic of China	1 192	539	603	254	642	210
	Other countries	74	45	—	—	155	59
	Total	1 572	769	1 438	754	3 515	1 349
EXPORTS							
2511.10	Natural barium sulphate (barytes)						
	United States	11 714	3 958	14 219	4 936	20 685	5 516
	Chile	40	30	41	28	168	123
	Argentina	230	141	187	131	126	89
	Brazil	—	—	43	22	149	71
	Other countries	245	135	862	169	180	108
	Total	12 229	4 264	15 352	5 286	21 308	5 907
2827.38	Barium chloride						
	United States	13	27	—	—	1	5
	Total	13	27	—	—	1	5
2833.27	Barium sulphate						
	Argentina	20	19	—	—	21	14
	Other countries	97	61	145	85	—	—
	Total	117	83	145	87	21	14

TABLE 1 (cont'd)

Item No.	1995		1996		1997P	
	(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)
2834.29	Other nitrates					
	19	4	79	43	22	47
	United States					
	1	4	8	2	8	22
	Other countries					
	20	9	87	46	30	70
2836.60	Barium carbonate					
	–	–	–	–	5	169
	South Africa					
	12	5	–	–	–	–
	United States					
	12	5	–	–	5	169
APPARENT CONSUMPTION						
	65 050	..	58 087	..	102 381	..
	1993	1994	1995	1996P		
	(tonnes)					
REPORTED CONSUMPTION¹						
	x	x	x	x		
	Well drilling					
	x	x	x	x		
	Paint and varnish					
	6 591 ^r	8 112 ^r	10 691	12 211		
	Other products ²					
	13 118 ^r	13 737 ^r	17 118	14 399		
	Total					

Sources: Natural Resources Canada; Statistics Canada.

– Nil; . . Not available; P Preliminary; r Revised; x Confidential.

¹ Available data reported by consumers. ² "Other products" include plastics, bearings and brake linings, nonferrous smelting and refining, etc.

Note: Numbers may not add to totals due to rounding.

TABLE 2. CANADA, BARITE PRODUCTION, TRADE, AND APPARENT CONSUMPTION, 1985-97

	Production ¹	Imports	Exports	Apparent Consumption
	(tonnes)			
1985	71 049	26 589	1 677	95 961
1986	40 335	10 525	5 069	45 791
1987	42 103	4 573	6 052	40 624
1988	51 450	4 529	8 022	47 957
1989	38 511	5 539	6 214	37 836
1990	43 906	7 967	9 928	41 945
1991	46 614	12 572	12 052	47 134
1992	34 870	11 905	17 221	29 554
1993	37 712	15 920	11 065	42 567
1994	64 701	14 776	13 054	66 423
1995	60 662	16 617	12 229	65 050
1996	57 967	15 472	15 352	58 087
1997P	102 800	20 889	21 308	102 381

Sources: Natural Resources Canada; Statistics Canada.

P Preliminary.

¹ Mine shipments.