

LITHIUM

(Data in metric tons of lithium content unless otherwise noted)

Domestic Production and Use: Chile was the leading lithium chemical producer in the world; Argentina, China, Russia, and the United States also were major producers. Australia, Canada, and Zimbabwe were major producers of lithium ore concentrates. The United States remained the leading consumer of lithium minerals and compounds and the leading producer of value-added lithium materials. Because only one company produced lithium compounds from domestic resources, reported production and value of production data cannot be published. Estimation of value for the lithium mineral compounds produced in the United States is extremely difficult because of the large number of compounds used in a wide variety of end uses and the great variability of the prices for the different compounds.

The use of lithium compounds in ceramics, glass, and primary aluminum production represented more than 60% of estimated domestic consumption. Other major end uses for lithium were in the manufacture of lubricants and greases, primary and secondary (rechargeable) batteries, and in the production of synthetic rubber.

Salient Statistics—United States:	2000	2001	2002	2003	2004^e
Production	W	W	W	W	W
Imports for consumption	2,880	1,990	1,920	2,200	2,400
Exports	1,310	1,480	1,620	1,520	1,600
Consumption:					
Apparent	W	W	W	W	W
Estimated	2,800	1,400	1,100	1,400	1,500
Price, yearend, dollars per kilogram:					
Lithium carbonate	4.47	NA	NA	NA	NA
Lithium hydroxide, monohydrate	5.74	NA	NA	NA	NA
Employment, mine and mill, number ^e	100	100	100	100	100
Net import reliance ¹ as a percentage of apparent consumption	>50%	≤50%	≤50%	≤50%	>50%

Recycling: Insignificant, but growing through the recycling of lithium batteries.

Import Sources (2000-03): Chile, 83%; Argentina, 12%; and other, 5%.

Tariff:	Item	Number	Normal Trade Relations
			12-31-04
	Other alkali metals	2805.19.9000	5.5% ad val.
	Lithium oxide and hydroxide	2825.20.0000	3.7% ad val.
	Lithium carbonate:		
	U.S.P. grade	2836.91.0010	3.7% ad val.
	Other	2836.91.0050	3.7% ad val.

Depletion Allowance: 22% (Domestic), 14% (Foreign).

Government Stockpile: None.

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Events, Trends, and Issues: The only active lithium carbonate plant in the United States was at a brine operation in Nevada. Subsurface brines have become the dominant raw material for lithium carbonate production worldwide because of lower production costs as compared with the mining and processing costs for hard-rock ores. Two brine operations in Chile dominate the world market; a facility at a brine deposit in Argentina produced lithium carbonate and lithium chloride. Most of the lithium minerals mined in the world were used directly as ore concentrates in ceramics and glass applications rather than feedstock for lithium carbonate and other lithium compounds.

Two companies produced a large array of downstream lithium compounds in the United States from domestic or South American lithium carbonate. A U.S. recycling company produced a small quantity of lithium carbonate from solutions recovered during the recycling of lithium batteries.

The market for lithium compounds with the largest potential for growth is batteries, especially rechargeable batteries. Rechargeable lithium batteries were growing in popularity for powering video cameras, portable computers and telephones, and cordless tools. Interest in lithium batteries for hybrid electric vehicles, vehicles with an internal combustion engine and a battery-powered electric motor, continued. Commercially available hybrid vehicles do not use lithium batteries, although future models may. Nonrechargeable lithium batteries were used in calculators, cameras, computers, electronic games, watches, and other devices.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ²	Reserve base ²
	2003	2004 ^e		
United States	W	W	38,000	410,000
Argentina ^e	960	1,300	NA	NA
Australia ^e	3,450	3,450	160,000	260,000
Bolivia	—	—	—	5,400,000
Brazil	240	240	190,000	910,000
Canada	710	700	180,000	360,000
Chile	6,580	6,600	3,000,000	3,000,000
China	2,500	2,700	540,000	1,100,000
Portugal	190	190	NA	NA
Zimbabwe	480	360	23,000	27,000
World total (rounded)	³ 15,100	³ 15,500	⁴ 4,100,000	⁴ 11,000,000

World Resources: The identified lithium resources total 760,000 tons in the United States and more than 13 million tons in other countries.

Substitutes: Substitutes for lithium compounds are possible in manufactured glass, ceramics, greases, and batteries. Examples are sodic and potassic fluxes in ceramics and glass manufacture; calcium and aluminum soaps as substitutes for stearates in greases; and calcium, magnesium, mercury, and zinc as anode material in primary batteries. Lithium carbonate is not considered to be an essential ingredient in aluminum potlines. Substitutes for aluminum-lithium alloys as structural materials are composite materials consisting of boron, glass, or polymer fibers in engineering resins.

^eEstimated. NA Not available. W Withheld to avoid disclosing company proprietary data. — Zero.

¹Defined as imports – exports + adjustments for Government and industry stock changes.

²See [Appendix C](#) for definitions.

³Excludes U.S. production.

⁴Excludes Argentina and Portugal.