



U.S. DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

Trends in Tungsten, Molybdenum, and Cobalt Production and Trade in China

by

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Trends in Metal Production and Trade in China

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Share of Chinese Metal Production in the World

<u>Commodity</u>	<u>Percentage</u>	<u>Rank</u>
Aluminum	17	1
Antimony	89	1
Copper	10	3
Gold	7.2	4
Lead	18	2
Magnesium	41	1
Molybdenum	22	3
Rare Earths	85	1
Silver	9.6	4
Tin	32	1
Tungsten	83	1
Zinc	22	1

Tungsten

- ▶ Resources

Wolframite deposits

Scheelite deposits

- ▶ Production and Consumption

- ▶ Trade

- ▶ Government Policies

Major Tungsten Deposits in China



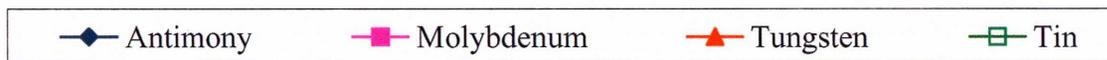
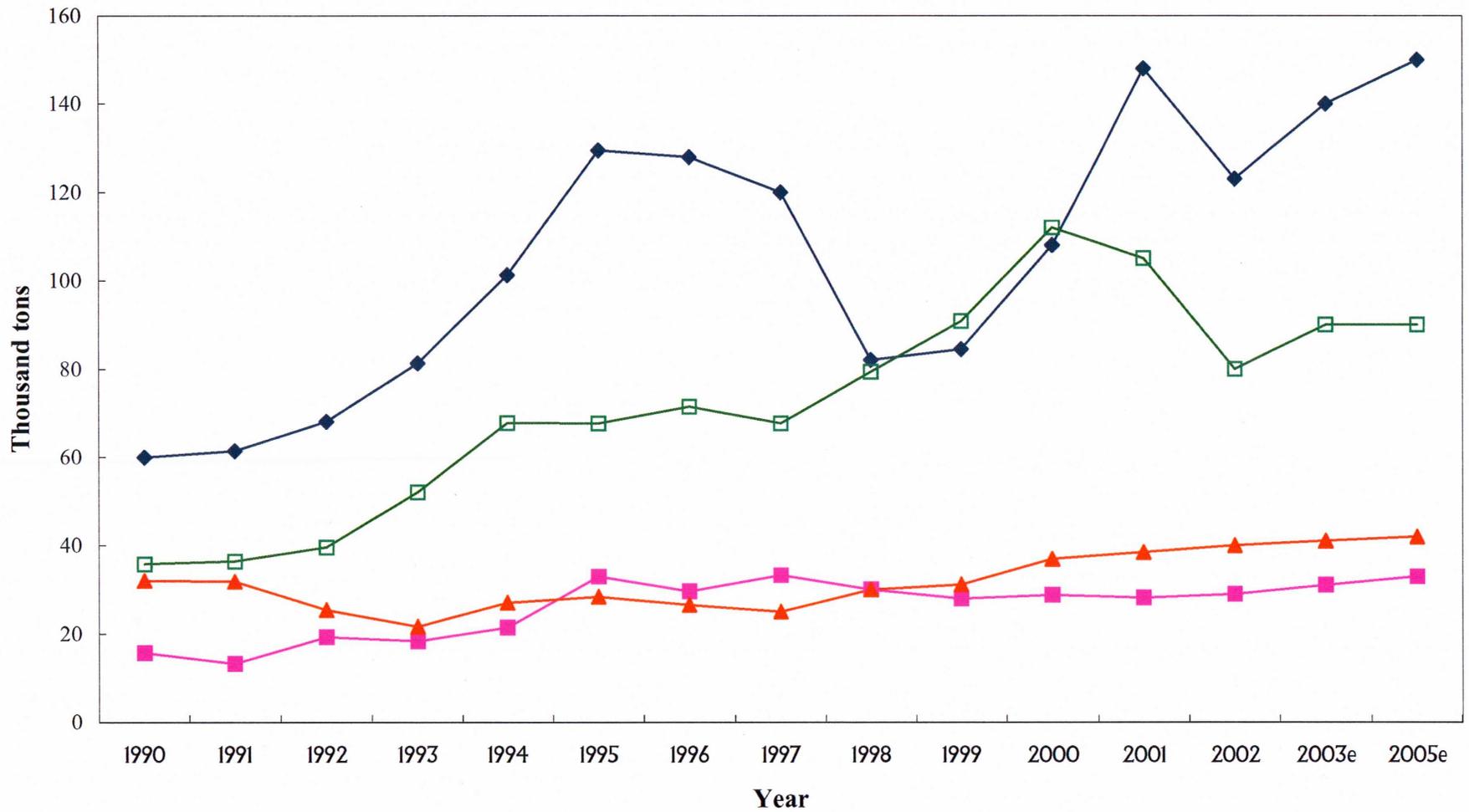
Legend

- International boundary
- - - Provincial boundary
- ⊙ Capital
- ▨ Location of Major Tungsten Deposits

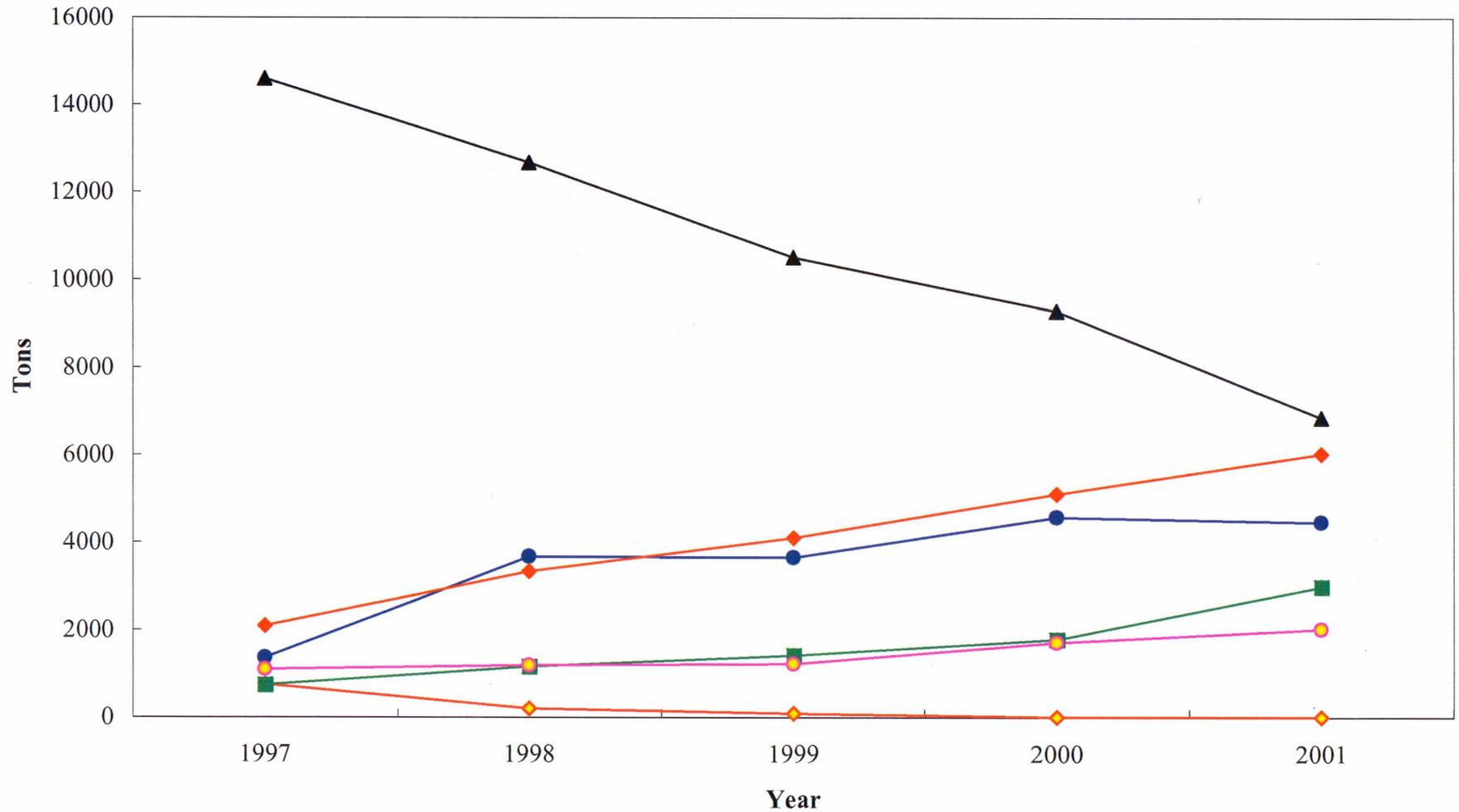
0 120 240 360 kilometers

5

Sb, Mo, W, and Sn Production in China, 1990-2005

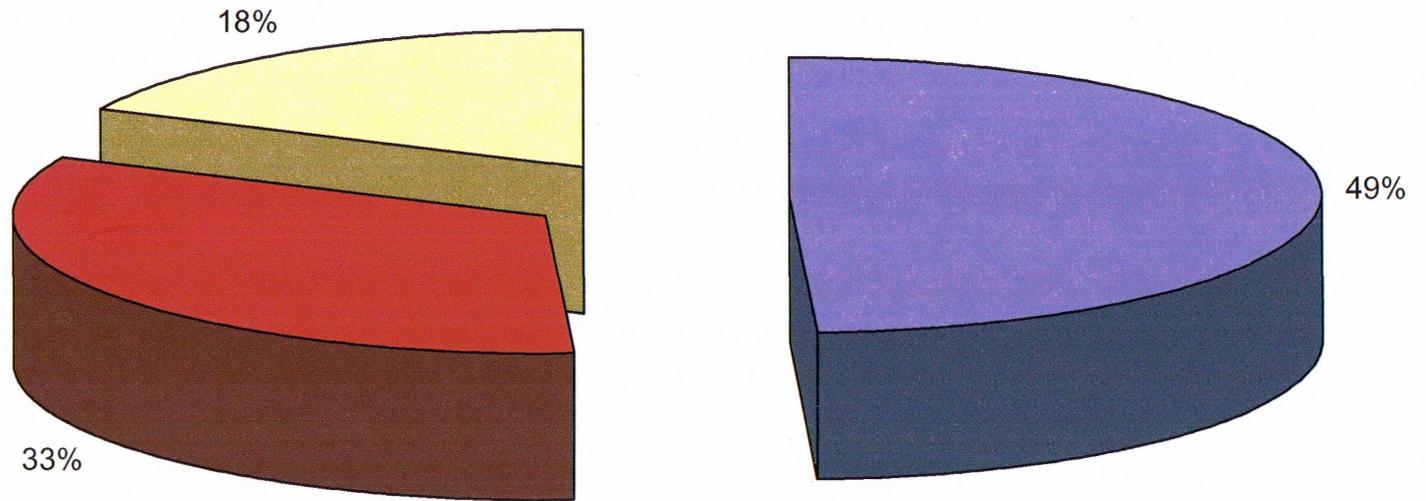


Chinese Exports of Tungsten Products, 1997-2001



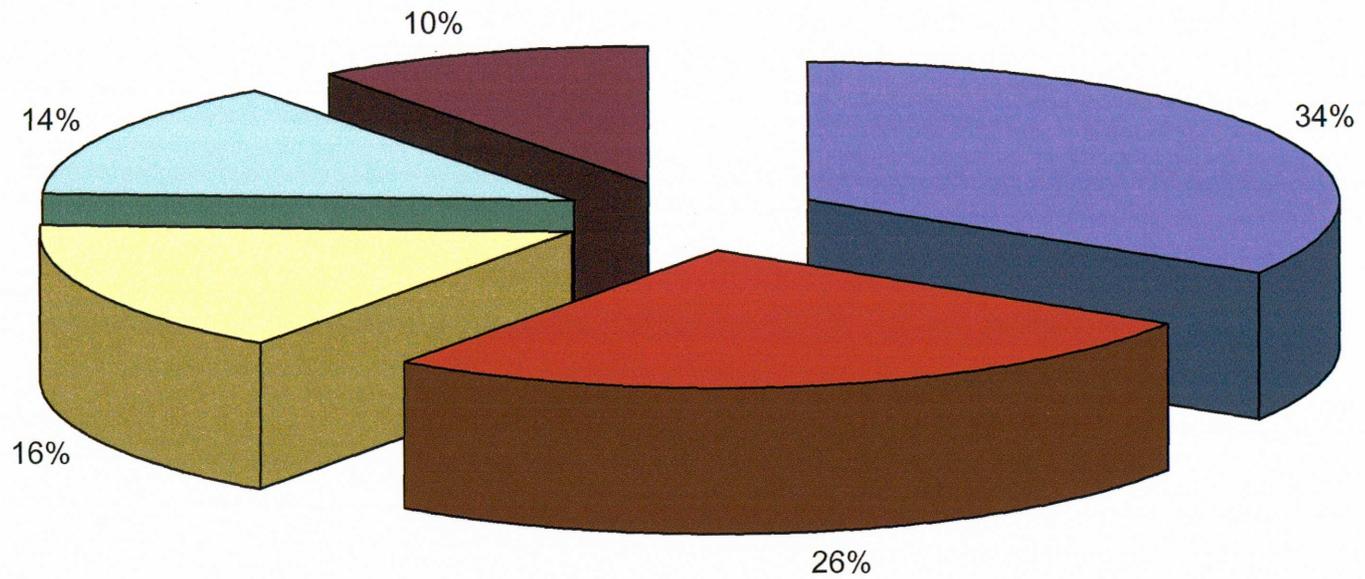
◆ Concentrates ● WO3 ▲ APT ◆ Ferrotungsten ■ Tungsten Powder ● Tungsten Carbide

Sources of Tungsten Concentrates Imported by China, 2001



■ North Korea ■ Malaysia ■ Russia

Destinations for Chinese WO3 Exports in 2001



■ Sweden ■ Netherlands ■ Japan ■ US ■ Others

Companies which are allowed to trade tungsten and its products

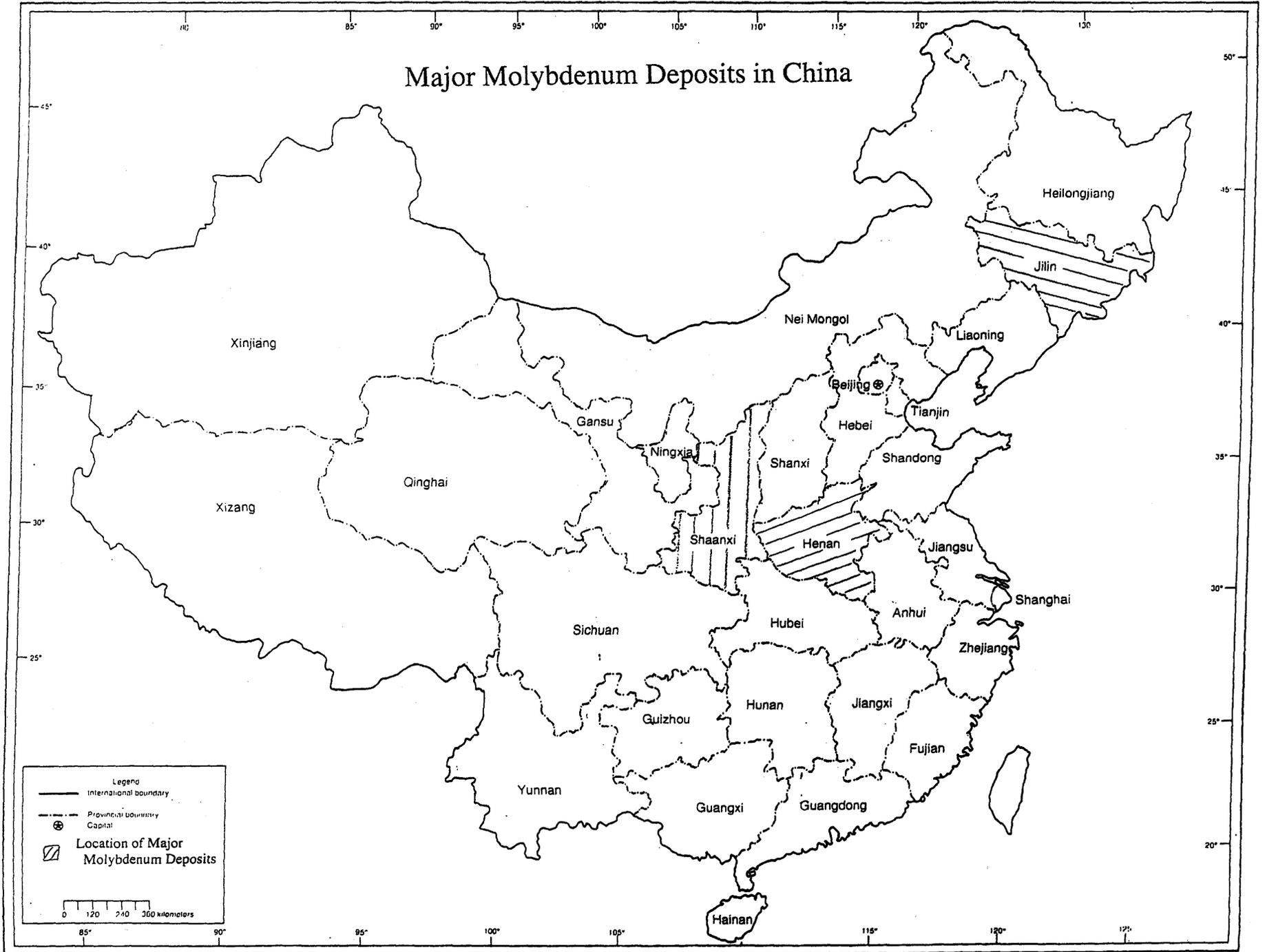
China National Metals and Minerals Import and Export Co.

China National Nonferrous Import and Export Co.

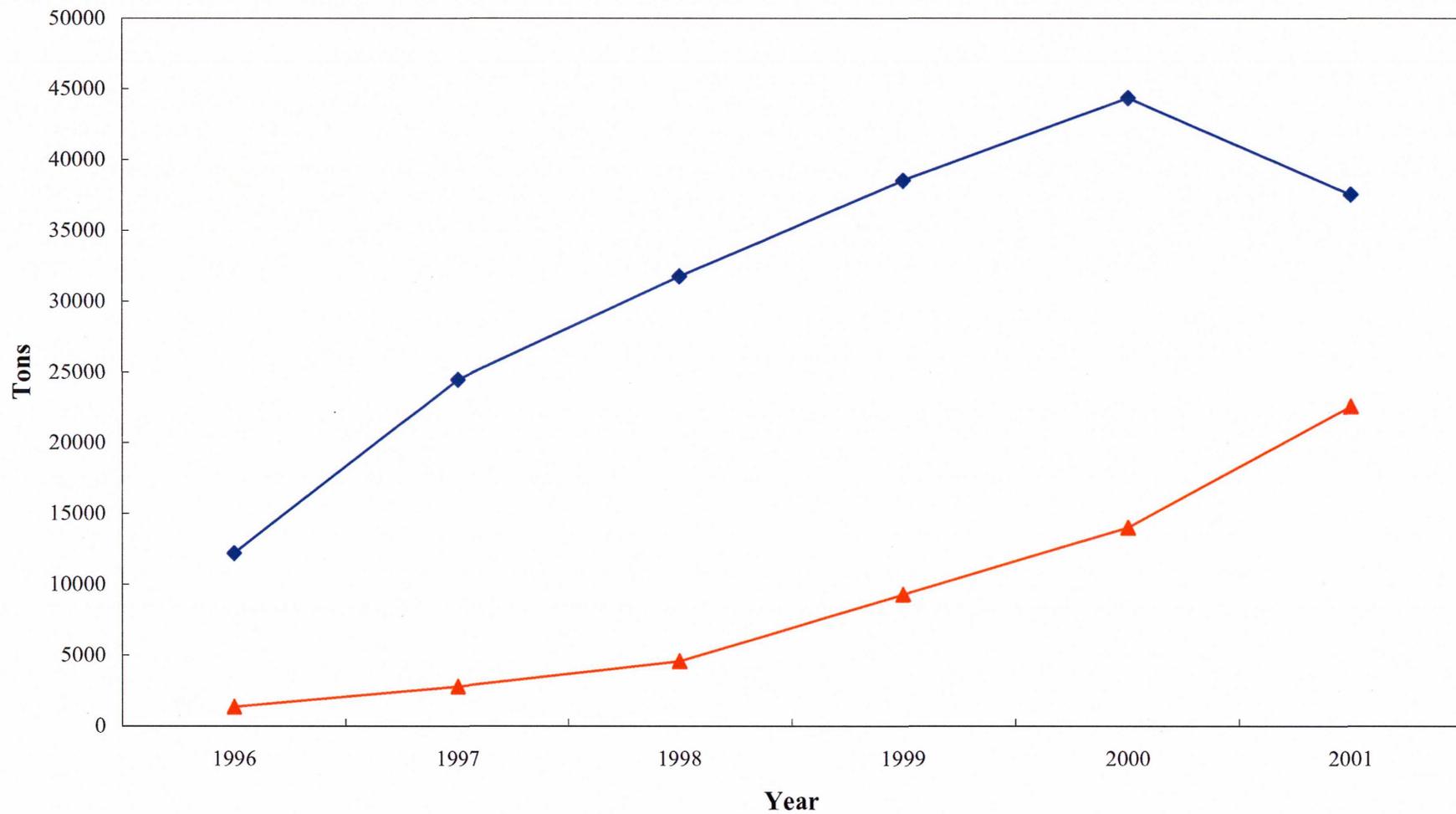
China Rare Earth and Metal Group Co.

China National Chemical Import and Export Co.

Major Molybdenum Deposits in China

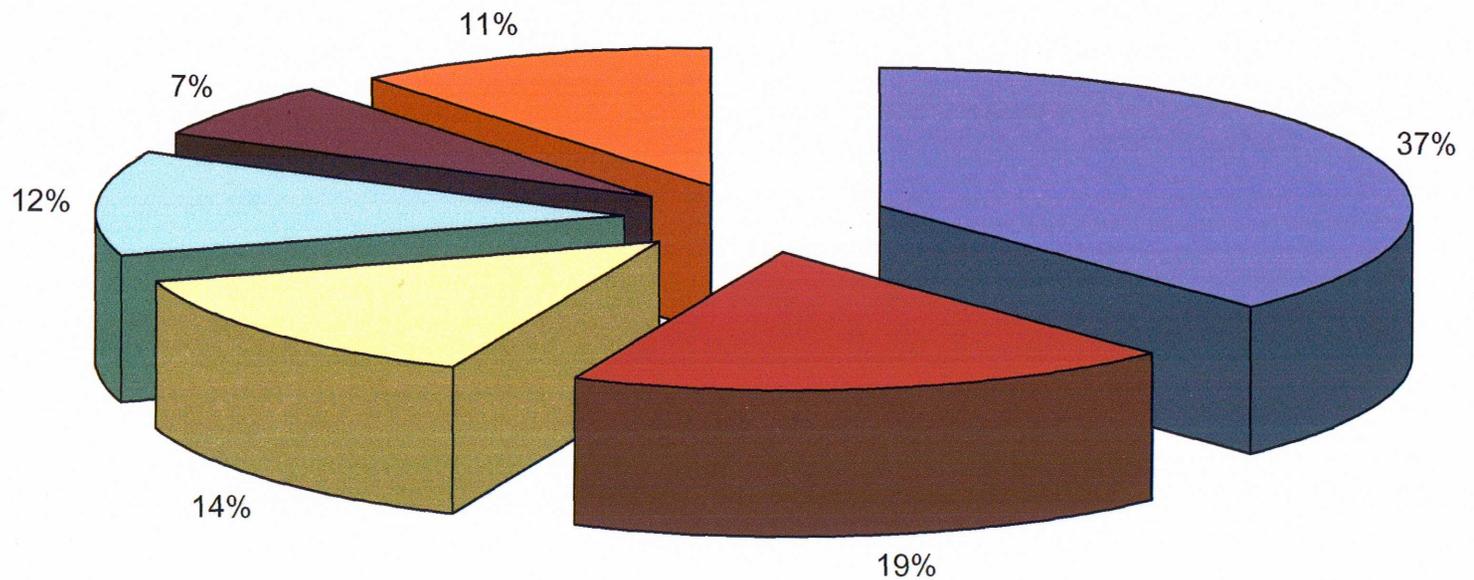


Chinese Exports of Molybdenum Products, 1996-2001



◆ Ferromolybdenum ▲ Roasted molybdenum

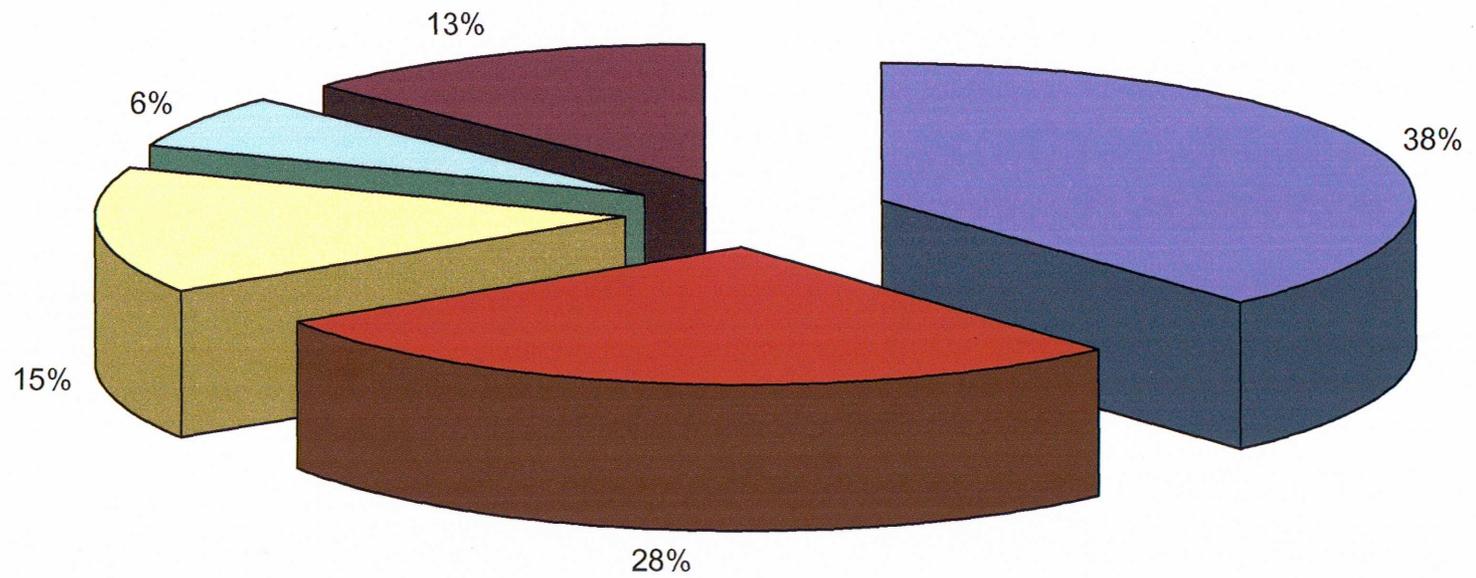
Sources of Molybdenum Concentrates Imported by China, 2001



■ Russia ■ Chile ■ Mongolia ■ Canada ■ Peru ■ Other

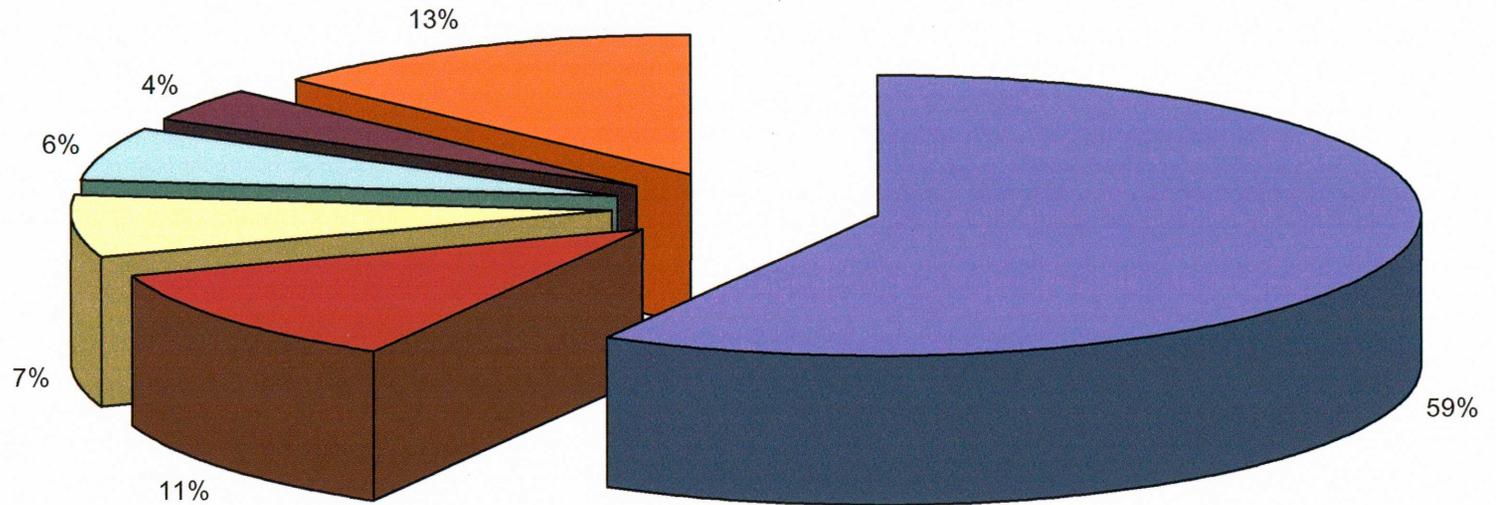
13

Destinations for Chinese Roasted Molybdenum Exports in 2001



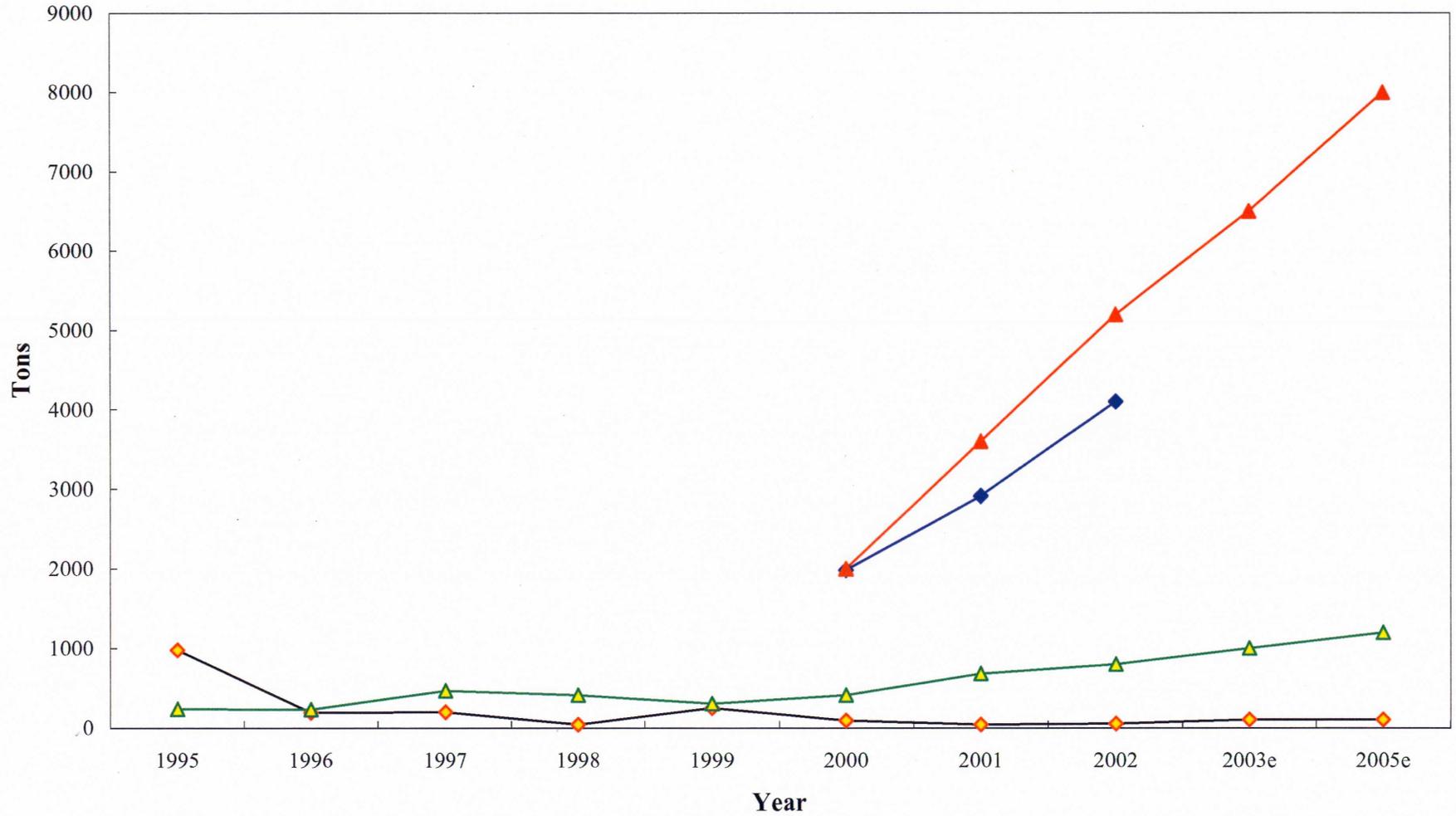
■ Netherlands ■ Japan ■ Korea, Rep. Of ■ United Kingdom ■ Others

Destinations for China's Ferromolybdenum Exports in 2001



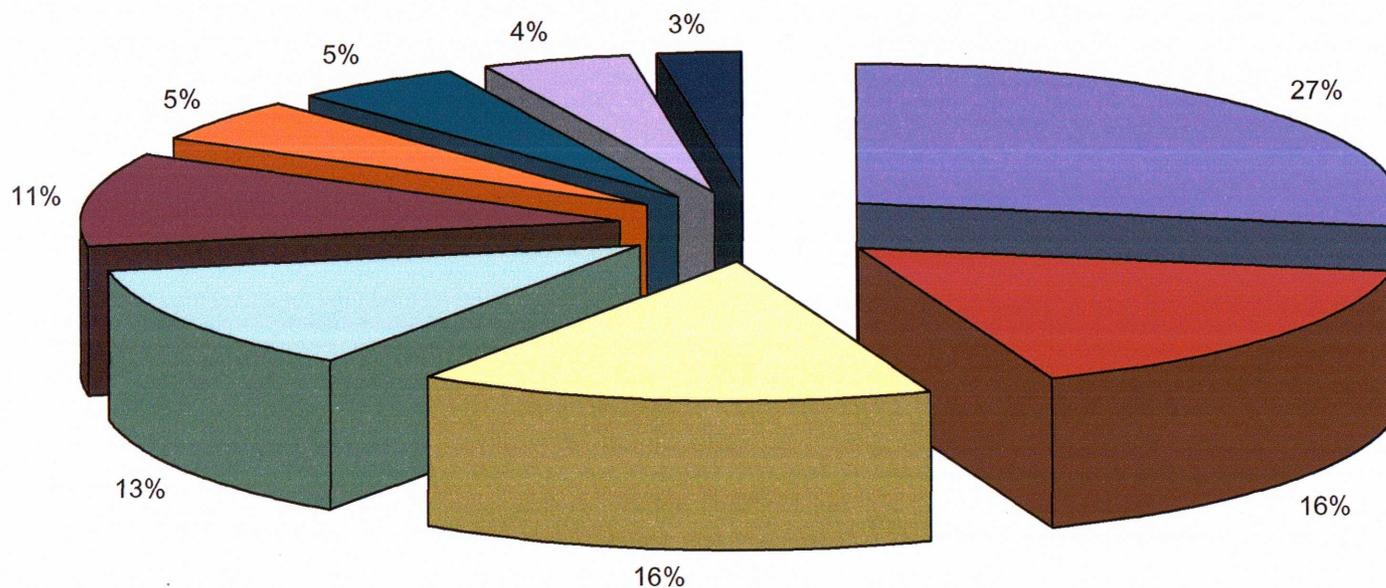
■ Netherlands ■ United States ■ Japan ■ Korea, Rep. of ■ Taiwan ■ Others

Cobalt Production and Demand in China, 1995-2005



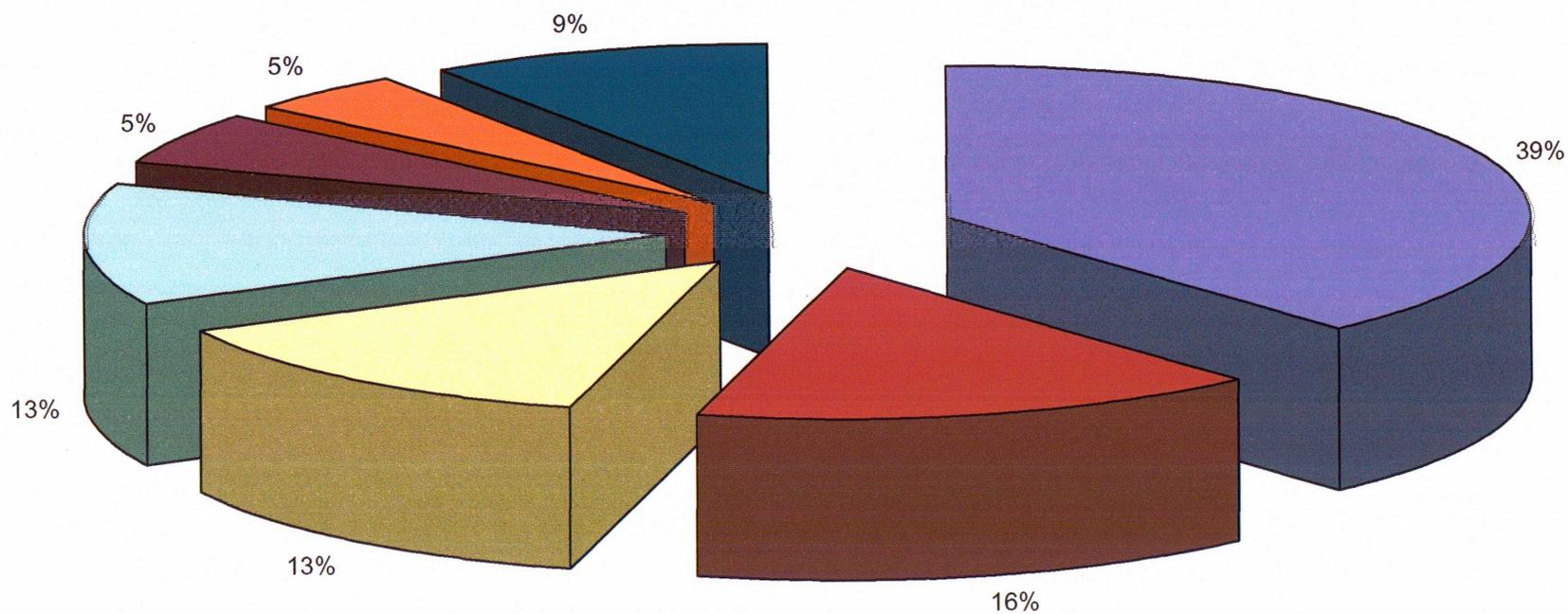
—◆— Concentrate —▲— Metal —◆— Import Unwrought —▲— Demand

Sources of Cobalt Concentrates Imported by China, 2001



■ Zaire ■ South Africa ■ Cuba ■ Congo ■ Morocco ■ Zambia ■ Australia ■ US ■ Others

Sources of Unwrought Cobalt Imported by China, 2001



Zambia Congo Australia Japan Canada South Africa Others

18

Management of Export Permits:

- Ministry of Foreign Trade and Economic Corp. (MOFTEC)
- Special Export Permit Office
- Local Export Trade Office

MOFTEC coordinates with provincial and local governments and associations to issue permits.

Associations which assigned to perform this function are:

China Iron and Steel Industry Association
China Nonferrous Metals Industry Association

Trade categories related to minerals and metals

- ✓ Restricted export items—Radioactive materials
- ✓ State control—antimony and its oxide, coal, ore and concentrates of tin, tungsten, and zinc, rare-earths, tin and its products, ammonium paratungstate, tungsten products, zinc and its alloys, petroleum and its products
- ✓ Provincial and local governments—some steel products

Import Tariff Rate (%)

Ore and Concentrates of Metals	0
Tungstic acid	5.5
Tungsten oxide	5.5
Ammonium paratungstate	5.5
Tungsten carbide	2
Ferrotungsten	2
Tungsten powder	6
Tungsten bar, sheet, and plate	5
Tungsten wire	9
Other tungsten products	8
Ammonium molybdate	5.5
Molybdenum oxide	5.5
Ferromolybdenum	2
Molybdenum powder	6
Molybdenum, unwrought	3
Molybdenum bar, plate, and sheet	8
Molybdenum wire	8
Other molybdenum products	8
Tantalum waste and scrap	6
Tantalum bar and rod	6
Other tantalum products	8
Cobalt mattes and other intermediate products	4
Cobalt carbonate	5.5
Other cobalt products	8

PRODUCTS SUBJECT TO EXPORT DUTY

NO	HS NO	DESCRIPTION OF PRODUCTS	EXPORT DUTY RATE (%)
1	03019210	Live eels fry	20.0
2	05061000	Ossein and bones treated with acid	40.0
3	05069010	Powder and waste of bones	40.0
4	05069090	Bones and horn-cores, unworked, defatted, simply prepared (but not cut to shape), treated with acid or degelatinized, excl. Ossein and bones treated with acid	40.0
5	26070000	Lead ores & concentrates	30.0
6	26080000	Zinc ores & concentrates	30.0
7	26090000	Tin ores & concentrates	50.0
8	26110000	Tungsten ores & concentrates	20.0
9	26159000	Niobium, tantalum & vanadium ores & concentrates	30.0
10	26171010	Crude antimony	20.0
11	28047010	Yellow phosphorus (white phosphorus)	20.0
12	28047090	Phosphorus, nes	20.0
13	28269000	Fluorosilicates and fluoroaluminates and complex fluorine salts, nes	30.0
14	29022000	Benzene	40.0
15	41031010	Slabs of goats, fresh, or salted, dried, limed, pickled or otherwise preserved, but not tanned, parchment-dressed or further prepared, whether or not dehaired or split	20.0
16	72011000	Non-alloy pig iron containing by weight <0.5% of phosphorus in pigs, blocks or other primary forms	20.0
17	72012000	Non-alloy pig iron containing by weight >0.5% of phosphorus in pigs, blocks or other primary forms	20.0
18	72015000	Alloy pig iron and spiegeleisen, in pigs, blocks or other primary forms	20.0
19	72021100	Ferro-manganese, containing by weight more than 2% of carbon	20.0
20	72021900	Ferro-manganese, nes	20.0
21	72022100	Ferro-silicon, containing by weight more than 55% of silicon	25.0
22	72022900	Ferro-silicon, nes	25.0
23	72023000	Ferro-silico-manganese	20.0
24	72024100	Ferro-chromium containing by weight more than 4% of carbon	40.0
25	72024900	Ferro-chromium, nes	40.0
26	72041000	Waste & scrap, of cast iron	40.0
27	72042100	Waste & scrap, of stainless steel	40.0
28	72042900	Waste & scrap of alloy steel, other than stainless steel	40.0
29	72043000	Waste & scrap, of tinned iron or steel	40.0

NO	HS NO	DESCRIPTION OF PRODUCTS	EXPORT DUTY RATE (%)
30	72044100	Ferrous waste & scrap, nes, from turnings, shavings, chips, milling waste, sawdust, filings, trimmings and stampings, whether or not in bundles	40.0
31	72044900	Ferrous waste & scrap of iron or steel, nes	40.0
32	72045000	Remelting scrap ingots of iron or steel	40.0
33	74020000	Copper unrefined; copper anodes for electrolytic refining	30.0
34	74031100	Cathodes & sections of cathodes, of refined copper, unwrought	30.0
35	74031200	Wire bars, of refined copper, unwrought	30.0
36	74031300	Billets, of refined copper, unwrought	30.0
37	74031900	Refined copper, unwrought, nes	30.0
38	74032100	Copper-zinc base alloys (brass), unwrought	30.0
39	74032200	Copper -tin base alloys (bronze), unwrought	30.0
40	74032300	Copper - nickel base alloys (cupronickel) or copper-nickel-zinc base alloys (silver), unwrought	30.0
41	74032900	Copper alloys, unwrought (other than master alloys of heading 74.05)	30.0
42	74040000	Waste & scrap, of copper or copper alloys	30.0
43	74071000	Bars, rods & profiles of refined copper	30.0
44	74072100	Bars, rods & profiles, of copper-zinc base alloys	30.0
45	74072200	Bars, rods & profiles, of copper - nickel base alloys or copper-nickel-zinc base alloys	30.0
46	74072900	Bars, rods & profiles, of copper alloy nes	30.0
47	74081100	Wire of refined copper, of which the maximum cross-sectional dimension >6mm	30.0
48	74081900	Wire of refined copper, of which the maximum cross-sectional dimension ≤6mm	30.0
49	74082100	Wire of copper-zinc base alloys	30.0
50	74082200	Wire of copper - nickel base alloys or copper-nickel-zinc base alloy	30.0
51	74082900	Wire, of copper alloy nes	30.0
52	74091100	Plate, sheet & strip, thickness >0.15mm, of refined copper, in coil	30.0
53	74091900	Plate, sheet & strip, thickness >0.15mm, of refined copper, not in coil	30.0
54	74092100	Plate, sheet & strip, thickness >0.15mm, of copper-zinc base alloys, in coil	30.0
55	74092900	Plate, sheet & strip, thickness >0.15mm, of copper-zinc base alloys, not in coil	30.0
56	74093100	Plate, sheet & strip, thickness >0.15mm, of copper-tin base alloys, in coil	30.0
57	74093900	Plate, sheet & strip, thickness >0.15mm, of copper-tin base alloys, not in coil	30.0
58	74094000	Plate, sheet & strip, thickness >0.15mm, of copper - nickel base alloys or copper-nickel-zinc base alloy	30.0

NO	HS NO	DESCRIPTION OF PRODUCTS	EXPORT DUTY RATE (%)
59	74099000	Plate, sheet & strip, thickness >0.15mm, of copper alloy nes	30.0
60	75021000	Unwrought nickel, not alloyed	40.0
61	75022000	Unwrought nickel alloys	40.0
62	75089010	Electroplating anodes of nickel	40.0
63	76011000	Unwrought aluminium, not alloyed	30.0
64	76012000	Unwrought aluminium alloys	30.0
65	76020000	Aluminium waste & scrap	30.0
66	76041000	Bars, rods & profiles of aluminium, not alloyed	20.0
67	76042100	Hollow profiles of aluminium alloys	20.0
68	76042900	Bars, rods & profiles (excl. hollow profiles), of aluminium alloys	20.0
69	76051100	Wire of aluminium, not alloyed, with the maximum cross-sectional dimension >7mm	20.0
70	76051900	Wire of aluminium, not alloyed, with the maximum cross-sectional dimension ≤ 7 mm	20.0
71	76052100	Wire of aluminium alloys, with the maximum cross sectional dimension >7mm	20.0
72	76052900	Wire of aluminium alloys, with the maximum cross sectional dimension ≤ 7 mm	20.0
73	76061120	Plates & sheets & strip, rectangular (incl. square), of aluminium, not alloyed, 0.30mm \leq thickness \leq 0.36mm	20.0
74	76061190	Plates & sheets & strip, rectangular (incl. square), of aluminium, not alloyed, 0.30mm > thickness > 0.2mm	20.0
75	76061220	Plates & sheets & strip, rectangular (incl. square), of aluminium alloys, 0.2mm < thickness < 0.28mm	20.0
76	76061230	Plates & sheets & strip, rectangular (incl. square), of aluminium alloys, 0.28mm \leq thickness \leq 0.35mm	20.0
77	76061240	Plates & sheets & strip, rectangular (incl. square), of aluminium alloys, 0.35mm < thickness	20.0
78	76069100	Plates & sheets & strip, of aluminium, not alloyed, thickness > 0.2mm, nes	20.0
79	76069200	Plates & sheets & strip, of aluminium alloys, thickness > 0.2mm, nes	20.0
80	79011100	Unwrought zinc, not alloyed, containing by weight $\geq 99.99\%$ of zinc	20.0
81	79011200	Unwrought zinc, not alloyed, containing by weight < 99.99% of zinc	20.0
82	79012000	Unwrought zinc alloys	20.0
83	81100020	Antimony unwrought	20.0
84	81100030	Antimony waste and scrap; Antimony powders	20.0

Chinese Export Quotas, 2003

Antimony and products	67,000 t (Metal)
Magnesia	1,300,000 t
Rare earths	40,000 t (REO)
Silver	2200 t (Metal)
Tin and products	65,000 t (Metal)
Tungsten and products	16,300 t (Metal)
Zinc and products	600,000 t (Metal)

Tax Rebate

Foreign Investment

Encouraged

Exploration and Development:

Bauxite, Copper, Lead, Zinc—joint venture only

Gold—low ore grade and require advanced smelting technology—joint venture only

Smelting and Manufacturing:

Alumina—300,000 tons or higher output capacity

Metal carbides

Antimony or tin alloys

Rare-earth application

Restricted

Exploration and Development:

Antimony, Barite, Diamond, Fluorite, Platinum-Group Metals, Tin, and Tungsten—joint venture or co-operation

Sulfate process to produce titanium dioxide pigment

Rare-earth separation and smelting—joint venture only

Prohibited

Rare-earth exploration

Radioactive materials exploration and processing