

# PORTUGAL

By Harold R. Newman

The southern Iberian Peninsula, known as the Iberian Pyrite Belt (IPB), is one of the most mineralized areas of Western Europe and is geologically very complex. Massive sulfides linked to synorogenic volcanism in the southwestern part of the peninsula are well-known internationally. The metallogenic province stretches about 250 kilometers (km) from Seville, Spain, to the southwestern coast of Portugal.

The IPB's volcanogenic massive sulfide (VMS) deposits, which date to the Upper Devonian and the Lower Carboniferous ages, were deposited during submarine felsic volcanism. Clusters of deposits occur around individual volcanic centers, the ore lying in zones within volcanic and sedimentary host-rock sequences. Typically, these are overlain by a continental flysch group that can be up to 5 km thick. The largest individual deposit located to date was estimated to have held an original resource of about 500 million metric tons (Mt), which was a significant proportion of the 1,725 Mt total resource estimated for the IPB as a whole based on the 90 or so known sulfide deposits. Allowing for previous production, sulfide deposit resources in 1999 (the latest year for which data are available) were estimated to be about 1,100 Mt (Mining Journal, 1999).

In 2000, the mineral industry of Portugal was modest by world standards; its growth rate during the past few years, however, has made minerals one of the country's dynamic industrial sectors. This was mainly because of the discovery and development of the rich copper and tin deposits of Sociedade Mineira de Neves-Corvo S.A. (Somincor) at Neves-Corvo. Although Portugal was the largest producer of mined copper in the European Union (EU) in 2000, labor problems resulted in a decline of production from the previous year (table 1).

The Government continued with the country's privatization program and was proceeding with legislation that would privatize many public companies. The privatization issue was part of a broader program to reduce the role of the state and to restructure the Portuguese economy to one that is more market driven.

Portugal's economic growth during the last decade has been accompanied by a heavy investment in infrastructure improvements largely funded by the EU. From 1987 to 1999, Portugal received net financial flows from the EU of about \$27 billion (€29 billion). As a result, the country has made a number of major infrastructure improvements, most notably a system of modern highways. A new international airport and an upgrade of the country's rail system also were planned (U.S. Embassy, Lisbon, Portugal, 2000). Table 2 lists selected indices of industrial production.

## Commodity Review

### Metals

The Neves-Corvo Mine of Somincor and the Panasqueira tungsten mine of Avocet Mining plc were the two major

operations in the metals mining sector. Pirites Alentejanas S.A.R.L. was the country's largest producer of pyrite. Siderúrgia Nacional S.A.R.L. produced iron and steel. Cimentos de Portugal S.A. (Cimpor), which was an important producer of cement, was one of the companies included in the Government's privatization plans. With the exception of copper, dimension stone, ferroalloys, tin, and tungsten, which were of international importance, production of other minerals and related materials had only domestic significance. Most of the large mineral-related companies were owned or controlled by the Government, although some operations were privately owned (table 3).

Tables 4 and 5 list Portuguese exports/reexports and imports of selected mineral commodities in 1998 (the latest year for which data are available).

Somincor was 51% Government-owned through the mining conglomerate Empresa de Desenvolvimento Mineiro (EDM). The minority partner was Rio Tinto Ltd. of the United Kingdom, which owned 49% of the joint venture. Somincor's underground mine, which used a drift-and-fill mining method, was designed to produce 1.5 million metric tons per year (Mt/yr) of raw ore that yielded a concentrate that averaged 26% copper content. A conventional drilling, blasting, and mucking cycle was used. Primary crushing of ore was underground, and the ore was moved by a conveyor to a vertical shaft, where it was hoisted to the surface for secondary crushing and treatment. The life of the mine, which was based on estimated proven reserves, was expected to be 20 years (Richards and others, 1991).

Rio Tinto informed the Portuguese Government that it was selling its 49% interest in Somincor and had initiated a search for prospective candidates. Noranda Corp. of Canada and Outokumpu Oyi of Finland were two possibilities. Rio Tinto said the decision reflects its increasing focus on larger scale open pit copper operations. EDM was also prepared to sell part of its share but would retain 25% to 30% equity interest in Somincor (Metal Bulletin, 2000).

The Jales-Tres Minas District was probably the most important gold district in Portugal. The area includes the ancient Jales Mine and is 150 km east of Oporto. By the end of its operation, the Jales Mine had produced more than 25 metric tons (t) of gold and more than 100 t of silver and had reached a depth of 600 meters (m) (Neiva and others, 1989).

Gold exploration activities were continuing at Jales-Tres Minas. The joint venture of Sociedade des Mines du Bourneix and EDM reevaluated some of the old deposits that had not been worked since the 1980s.

The Portuguese iron and steel operation was nationalized in 1975 to function as a public entity incorporated as Siderúrgia Nacional Empresa de Productos Planos (SN-Planos). In 2000, the Government changed SN-Planos into a public limited company as a major step toward privatization.

Avocet's Panasqueira Mine was one of the world's largest producers of tungsten concentrates outside of China. Avocet

commissioned a new subvertical shaft that accessed 4.7 Mt of estimated ore resources with an in situ grade of 0.33% tungsten oxide (WO<sub>3</sub>), given an estimated 10-year life at current (2000) extraction rates. Avocet was undertaking a program to develop these WO<sub>3</sub> resources to a mining reserve category with the possibility of expanding production (Avocet Mining plc, 2000, Tungsten mining, accessed March 26, 2001, at URL <http://www.avocet.co.uk/mining/tungstenmining.htm>).

EuroZinc Mining Corp. was formed in early 1999 by the amalgamation of Auspex Mining Ltd., EDM, and International Vestor Resources Ltd. EuroZinc was encouraged by the results of a prefeasibility study that confirmed their expectation that on the basis of developing a new deposit, the Aljustrel mine/mill complex could be brought into production relatively quickly as a low-cost zinc producer. The Aljustrel project encompassed five massive sulfide deposits—the Feitas, the Moinho, the Estação, the Gavião, and the Algaes. These are typically zoned VMS deposits with lead, silver, and zinc zones at the top and with copper zones at the bottom and are often separated by tens of meters of low-grade pyrite (EuroZinc Mining Corp., March 2000, Current projects, accessed March 27, 2001, at URL <http://www.eurozinc.com/s/CurrentProjects.asp?PropertyInfID=543>)

The Feitas deposit was the most significant deposit in the Aljustrel Project area owing to its high zinc content, large tonnage, and existing infrastructure. It has extensive underground development in place. The deposit has a known strike length of 700 m; a projected strike length, based on gravity data, of 1,200 m; an average width of about 400 m; and an average thickness of about 60 m. The estimated proven and probable minable reserves were 12 Mt of zinc ore with an average grade of 5.67% zinc, an average grade of 1.7% lead, and an average grade of 64 grams per ton (g/t) silver. Proven and probable minable reserves were estimated to be 1.6 Mt of copper ore with an average grade of 2.2% copper, 0.97% zinc and 14 g/t silver (EuroZinc Mining Corp., March 2000, Current projects, accessed March 27, 2001, at URL <http://www.eurozinc.com/s/CurrentProjects.asp?PropertyInfoID=539>).

### **Industrial Minerals**

Portugal's industrial minerals sector was a modern and efficient producer of a variety of materials, most notably dimension stone and minerals for the manufacture of ceramics. The dimension stone industry continued to be an important segment of the mining industry in terms of value and trade.

Several international groups were interested in acquiring a stake in Portugal's largest cement producer Cimentos de Portugal S.A. (Cimpor). The Government was preparing to sell its 12.5% stake. Cimpor stated that it anticipated foreign acquisitions to increase output to between 25 and 30 Mt/yr in 4 years. Holderbank Group of Switzerland, Lafarge Group of France, and SECIL S.A. of Portugal were among the companies that had expressed interest in Cimpor (Wise, 2000). Demand for cement continued because the building and construction industry maintained a high level of activity. This situation was expected to continue to develop Portugal's infrastructure with the substantial volume of work in coming years.

Marble was the most valuable of the stone products and accounted for the majority of stone production. The main area for marble mining continued to be the Evora District.

### **Mineral Fuels**

Since the closure of Empresa Carbonifera de Douro S.A.R.L.'s Germunde Mine at Castello de Pavia in 1997, most coal was imported. The mine closed because of high production costs and difficult mining conditions.

Petroleos de Portugal (Petrogal) embarked on an ambitious plan to reposition itself as a multinational energy firm. The Government established a new energy holding company Galp Petroleos e Gas de Portugal, which included Petrogal and Gas de Portugal (GDP). The arrival of natural gas through a new gas pipeline linking Algeria with Portugal and Spain has led to a massive increase in gas sales. GDP controls the gas pipeline company Transgas S.A. Petrogal itself has set basic targets—to develop its own production of hydrocarbons, to expand and upgrade its refineries to meet EU standards, to consolidate the distribution of petroleum products within the Iberian peninsula, to expand its cogeneration business, and to develop its chemicals business, namely aromatics. Petrogal was planning to invest about \$1 billion during the next 3 years on environmental measures and to improve efficiency of its downstream operations (Oil & Gas Journal, 2000).

### **Outlook**

The present structure of the mineral industry could change in the near future because of significant mining exploration by several foreign companies. Copper, gold, kaolin, lead, lithium, pyrites, and tin were some of the minerals targeted for exploration. The IPB is the prime area for exploration activity and would appear to have an above-average potential for success based on an unusually high number of large VMS deposits.

### **References Cited**

- Metal Bulletin, 2000, Rio Tinto seeks candidates for Somincor sale: Metal Bulletin, no. 8506, September 7, p. 17.
- Mining Journal, 1999, Iberia, the future lies deep: Mining Journal, v. 333, no. 8542, July 30, p. 86-87.
- Neiva, A.M., Neiva, J.M., and Silva, M.M., 1989, Geochemistry of gold quartz vein walls from Jales (northern Portugal): International Geological Congress, 28th, Washington, DC, June 1989, Abstracts 2, p. 504.
- Oil & Gas Journal, 2000, Portugal's Petrogal repositions itself: Oil & Gas Journal, v. 98, no. 7, February 14, p. 20.
- Richards, D.G., Carvalho, Pedro, and Sides, Edmund, 1991, Geology and reserves of complex sulphides at Neves-Corvo: Los Sulfuros Complejos del Suroeste de España, Sevilla, April 29-30, 1991, p. 12.
- U.S. Embassy, Lisbon, Portugal, 2000, Portugal: U.S. Department of State, Symposium, Country Commercial Guide, July, 78 p.
- Wise, Peter, 2000, Cement groups eye stake in Cimpor: Financial Times [London], no. 34231, May 31, p. 17.

### **Major Sources of Information**

Cabinete Para Pesquisa e Exploração de Petróleo-MIE  
Rue Vale do Pereiro, 4  
1200 Lisboa, Portugal  
Instituto Geológico e Mineiro  
R. Almirante Barroso, 38  
1000 Lisboa, Portugal

TABLE 1  
PORTUGAL: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity	1996	1997	1998	1999	2000 e/
<b>METALS</b>					
Arsenic, white e/	100	50	50	50	50
Beryl concentrate, gross weight e/	4	5	5	4	4
Copper, mine output, Cu content	107,773	106,479	114,637	99,459 r/	76,200 3/
Iron and steel:					
Iron ore and concentrate:					
Gross weight, manganiferous	18,620	18,905	18,000 e/	16,000 e/	15,000
Fe content, manganiferous	7,876	6,800	6,800 e/	11,733 r/	11,800
Metal:					
Pig iron	421	431	385	389	382 3/
Steel, crude	871	905	936 r/	1,038 r/	1,097 3/
Lead, refined, secondary e/	5,900	6,000	6,500	6,000	6,000
Manganese, Mn content of iron ore e/	500	500	500	500	500
Silver, mine output, Ag content	33,700	33,900	31,900	26,450 r/	20,430 3/
Tin:					
Mine output, Sn content	4,637	2,667	3,000 e/	2,163 r/	1,227 3/
Metal, primary and secondary e/	100	100	100	100	50
Tungsten, mine output, W content	776	1,036	831	434	743 3/
Uranium concentrate, U <sub>3</sub> O <sub>8</sub>	17	18	16	12	16 3/
Zinc, smelter, primary e/	3,600	3,600	3,600	4,000	3,600
<b>INDUSTRIAL MINERALS</b>					
Cement, hydraulic	8,455	9,395	9,500 e/	9,400 e/	9,200
Clays:					
Kaolin 4/	177,423	180,000	180,000 e/	221,296 r/	127,581 3/
Refractory e/	392,148 3/	300,000	300,000	521,602 r/	500,000
Diatomite e/	1,550	1,540	1,600	785 r/	686 3/
Feldspar	98,596	121,380	120,000 e/	114,685 r/	119,837 3/
Gypsum and anhydrite e/	520,722 3/	500,000	500,000	550,000	500,000
Lime, hydrated and quicklime e/	200,000	200,000	200,000	200,000	200,000
Lithium minerals, lepidolite	7,626	6,883	8,000	14,862 r/	9,352 3/
Nitrogen, N content of ammonia	197,600	195,600	204,400	223,200	246 3/
Pyrite and pyrrhotite (including cuprous), gross weight e/	10,000	10,000	10,000	10,000	10,000
Salt, rock	609,639	596,000	600,000 e/	558,807 r/	584,516 3/
Sand e/	5,127 3/	5,000	4,000 r/	3,664 3/	4,000
Sodium compounds, n.e.s.: e/					
Soda ash	150,000	150,000	150,000	150,000	150,000
Sulfate	50,000	50,000	50,000	50,000	50,000
Stone: e/					
Basalt	100	100	100	520,262 r/	500,000
Calcareous:					
Dolomite	510	500	500	500	500
Limestone, marl, calcite	35,370 3/	15,000	15,000	35,580 3/	35,000
Marble	945	900	900	1,215 3/	900
Diorite	282	1,000	1,000	17,649 3/	1,700
Gabbro	147	100	100	100	100
Granite, crushed	18,412 3/	24,057 3/	25,000	22,400 3/	20,000
Granite, ornamental	400	400	500	458 3/	500
Graywacke	60	20	22	20	20
Ophite	25	9	5	3	5
Quartz	14	14	15	15	38 3/
Quartzite	594	500	500	573 3/	600
Schist	260	100	100	136 3/	140
Slate	20	30	40	46 3/	40
Syenite	27	86	80	80	80
Sulfur: e/					
Content of pyrites	5,000	5,000	5,000	--	--
Byproduct, all sources	30,000	30,000	30,000	32,000	30,000
Total	35,000	35,000	35,000	32,000	30,000
Talc	8,277	8,236	8,400	9,554 r/	7,407 3/

See footnotes at end of table.

TABLE 1--Continued  
PORTUGAL: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity	1996	1997	1998	1999	2000 e/
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Coke, metallurgical e/ thousand tons	332 3/	330	330	325	325
Gas, manufactured e/ million cubic meters	125	125	125	125	125
<b>Petroleum refinery products:</b>					
Liquefied petroleum gas thousand 42-gallon barrels	4,338	4,500	4,500 e/	4,500 e/	4,500
Gasoline do.	21,828	15,000	15,000 e/	15,000 e/	15,000
Jet fuel do.	7,500	7,000	7,000 e/	7,000 e/	7,000
Kerosene do.	400	225	225 e/	225 e/	225
Distillate fuel oil do.	20,000	20,000	20,000 e/	20,000 e/	20,000
Residual fuel oil do.	20,000	20,000	20,000 e/	20,000 e/	20,000
All other products do.	9,000	10,000	10,000 e/	10,000 e/	10,000
Refinery fuel and losses do.	3,500	3,000	3,000 e/	3,000 e/	3,000
Total do.	86,566	79,725 r/	79,700 r/ e/	79,700 r/ e/	79,700

e/ Estimated. r/ Revised.

1/ Table includes data available through March 2001.

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

3/ Reported figure.

4/ Includes washed and unwashed kaolin.

TABLE 2  
PORTUGAL: SELECTED INDICES OF PRODUCTION

(1990 = 100)

Sector	1997	1998	1999	2000 e/
General	103	113	117	120
Mining	86	92	90	95
Manufacturing	102	108	110	112
Electricity and gas	113	146	169	170

e/ Estimated.

Source: United Nations, 2000, Monthly Bulletin of Statistics, v. LIV, no. 12, December, p. 30.

TABLE 3  
PORTUGAL: STRUCTURE OF THE MINERAL INDUSTRY IN 2000

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of facilities	Annual capacity
Cement	Cimentos de Portugal S.A. (Government, 100%)	10 plants, various locations	6,000
Copper concentrate	Sociedade Mineira de Neves-Corvo S.A. (Somincor) (Government, 51%; Rio Tinto Ltd., 49%)	Neves-Corvo Mine near Castro Verde	500
Diatomite	Sociedade Anglo-Portuguesa de Diatomite Lda.	Mines at Obidos and Rolica	5
Feldspar	A.J. da Fonseca Lda.	Seixigal Quarry, Chaves	10
Ferroalloys	Electrometalúrgia S.A.R.L.	Plant at Setubal	100
Petroleum, refined barrels per day	Petroleos de Portugal (Government, 100%)	Refineries at Lisbon, Porto, and Sines	300,000
Pyrite	Pirites Alentejanas S.A.R.L.	Plant at Setubal	100
Steel, crude	Siderurgia Nacional S.A.R.L. (Government, 100%)	Ironworks and steelworks at Seixal and Maia	1,000
Tin	Somincor (Government, 51%; Rio Tinto Ltd., 49%)	Neves-Corvo Mine near Castro Verde	5
Tungsten	Avocet Mining plc	Panasqueira Mine and plant at Barroca Grande	1,600
Uranium tons	Empresa Nacional de Uranio S.A. (Government, 100%)	Mines at Guargia, plant at Urgeirica	150
Zinc, refined	Quimigal E.P. (Government, 100%)	Electrolytic plant at Barreiro	11

TABLE 4  
PORTUGAL: EXPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Destinations	
		United States	Other (principal)
<b>METALS</b>			
<b>Aluminum:</b>			
Oxides and hydroxides	24	--	Thailand 20; Denmark 3.
Ash and residue	272	--	All to Spain.
Metal including alloys:			
Scrap	12,349	--	Spain 12,084; Hong Kong, China 82; Netherlands 56.
Unwrought	34,213	--	Spain 31,943; France 2,186; Germany 80.
Semimanufactures	7,703	(2/)	Spain 2,798; France 2,515; United Kingdom 810.
Antimony, metal including alloys, all forms	value, thousands \$3	--	Brazil \$1; Spain \$1.
Bismuth, metal including alloys, all forms	do. \$1	--	All to Latvia.
<b>Copper:</b>			
Ore and concentrate	447,370	--	Germany 128,186; Finland 120,854; Spain 101,772.
Sulfate	3	--	All to Sao Tome and Principe.
Metal including alloys:			
Scrap	9,892	--	Spain 9,125; Belgium-Luxembourg 249; Netherlands 233.
Unwrought	value, thousands \$2,209	--	Germany \$1,321; United Kingdom \$641; Spain \$215.
Semimanufactures	3,203	1	United Kingdom 1,109; Spain 912; France 514.
<b>Gold:</b>			
Waste and sweepings	value, thousands \$436	--	All to Spain.
Metal including alloys, unwrought and partly wro	do. \$8,385	\$13	Italy \$4,675; Spain \$3,684; Gabon \$5.
<b>Iron and steel:</b>			
Ore and concentrate, including roasted pyrite	5,500	--	All to Morocco.
<b>Metal:</b>			
Scrap	121,427	32	Spain 118,986; Hong Kong, China 2,195; Angola 117.
Pig iron, cast iron, related materials	3,006	--	Spain 2,937; Morocco 46; Benin 20.
<b>Ferroalloys:</b>			
Ferchromium	4	--	All to Morocco.
Ferromanganese	27	--	Spain 14; Morocco 13.
Ferrosilicon	218	--	Spain 215; Morocco 2; Mozambique 1.
Unspecified	1	--	All to Spain.
Steel, primary forms	88,366	20,062	Spain 34,154; Morocco 14,995; Netherlands 10,050.
<b>Semimanufactures:</b>			
Flat-rolled products:			
Of iron or nonalloy steel:			
Not clad, plated, coated	17,412	--	Spain 14,183; Angola 2,420; Cape Verde 267.
Clad, plated, coated	163,153	13,819	Spain 100,728; Italy 13,094; Canada 6,634.
Of alloy steel	5,662	3	Ireland 3,208; Spain 1,688; United Kingdom 271.
Bars, rods, angles, shapes, sections	176,378	532	Spain 141,648; Germany 15,919; United Kingdom 6,367.
Rails and accessories	157	--	India 33; Mozambique 33; Argentina 31.
Wire	21,375	549	Spain 18,888; Angola 775; United Kingdom 487.
Tubes, pipes, fittings	53,015	142	Spain 46,363; Angola 2,326; Cape Verde 1,090.
<b>Lead:</b>			
Oxides	3,217	417	Spain 2,466; Italy 217; Netherlands 51.
Metal including alloys:			
Scrap	1,542	--	All to Spain.
Unwrought	5	--	Do.
Semimanufactures	114	--	Spain 86; France 18; Angola 8.
<b>Magnesium, metal including alloys:</b>			
Scrap	value, thousands \$255	--	Norway \$252; Singapore \$2.
Unwrought	61	--	All to Norway.
Manganese, oxides	value, thousands \$1	--	All to Greece.
Mercury	3	--	All to Morocco.
<b>Molybdenum, metal including alloys:</b>			
Unwrought	value, thousands \$11	--	All to Brazil.
Semimanufactures	do. \$5	--	Do.
<b>Nickel, metal including alloys:</b>			
Scrap	28	--	All to Spain.
Semimanufactures	3	(2/)	United Kingdom 2.
Rare-earth, metals including alloys, all forms	20	--	All to Angola.
Silicon, high-purity	15	--	All to Spain.

See footnotes at end of table.

TABLE 4-Continued  
PORTUGAL: EXPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Destinations	
		United States	Other (principal)
METALS--Continued			
Silver, metal including alloys, unwrought and partly wrought	value, thousands	\$86	Spain \$67; Germany \$14; Angola \$2.
Tin:			
Ore and concentrate		6,257	-- Malaysia 3,179; Thailand 2,802; Turkmenistan 255.
Metal including alloys:			
Scrap		19	-- Netherlands 18; United Kingdom 1.
Semimanufactures	value, thousands	\$8	-- Spain \$3; Angola \$2; Cape Verde \$1.
Titanium:			
Oxides		101	-- Angola 37; Cape Verde 24; Spain 21.
Metal including alloys, all forms	value, thousands	\$50	\$49 Spain \$1.
Tungsten:			
Ore and concentrate		1,269	1,209 Japan 60.
Metal including alloys:			
Unwrought		22	-- All to Brazil.
Semimanufactures	value, thousands	\$106	-- Israel \$63; Romania \$19; Japan \$18.
Uranium and thorium, ore and concentrate	do.	\$2,093	-- All to United Kingdom.
Zinc:			
Oxides		6,985	-- Spain 4,365; France 877; Italy 536.
Ash and residue		96	-- All to Spain.
Metal including alloys:			
Scrap		2,380	-- Spain 2,218; Germany 162.
Unwrought		128	-- Spain 101; unspecified 27.
Semimanufactures		780	-- Angola 418; Spain 129; Sao Tome and Principe 103.
Other:			
Oxides and hydroxides		13,532	-- South Africa 13,006; Angola 526.
Precious metals, n.e.s., waste and scrap	value, thousands	\$131	-- All to Spain.
INDUSTRIAL MINERALS			
Abrasives, n.e.s.:			
Natural, corundum, emery, pumice, etc.	do.	\$46	-- Spain \$43; Angola \$3.
Artificial, silicon carbide		33	-- All to Spain.
Dust and powder of precious and semiprecious stones including diamonds	value, thousands	\$88	-- Cuba \$83; Greenland \$5.
Grinding and polishing wheels and stones		957	(2/) Spain 609; Italy 169; Angola 32.
Barite and witherite		23	-- All to France.
Boron:			
Crude natural borates	value, thousands	\$1	-- All to Mozambique.
Oxides and acids		41	-- Spain 24; Angola 17.
Cement		34,990	-- Cape Verde 22,429; Sao Tome and Principe 6,069; Guinea-Bissau 2,712.
Chalk		5,046	-- Spain 2,646; Brazil 1,230; Chile 572.
Clays, crude:			
Bentonite		671	-- Spain 610; Venezuela 40; Angola 21.
Chamotte earth and dinas earth		543	-- Morocco 473; Tunisia 48; Syria 22.
Fire clay		2,492	-- All to Spain.
Kaolin		2,741	-- Spain 1,821; Paraguay 449; Argentina 340.
Other		1	-- All to France.
Diamond, natural:			
Gem, not set or strung	value, thousands	\$62,290	\$3,707 United Kingdom \$42,836; Belgium-Luxembourg \$15,653; Germany \$70.
Dust and powder	do.	\$88	-- Cuba \$83; Greenland \$5.
Diatomite and other infusorial earth		4	-- All to Angola.
Feldspar		2,060	-- France 1,983; Spain 52; Italy 25.
Fertilizer materials, manufactured:			
Ammonia		25,122	-- Spain 18,515; Norway 6,603; Cape Verde 2.
Nitrogenous		132,561	-- Spain 87,426; Germany 28,987; Netherlands 5,989.
Phosphatic		41,725	-- Spain 28,158; Brazil 10,520; France 2,550.
Potassic	value, thousands	\$67	-- Cote d'Ivoire \$66; Cape Verde \$1.
Unspecified and mixed		14,893	-- Spain 141,165; Cote d'Ivoire 2,666; Angola 23.
Fluorspar		2	-- All to Morocco.

See footnotes at end of table.

TABLE 4--Continued  
PORTUGAL: EXPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Destinations	
		United States	Other (principal)
<b>INDUSTRIAL MINERALS--Continued</b>			
Gypsum and plaster	471	--	Cape Verde 248; Angola 171; Iceland 26.
Iodine value, thousands	\$2	--	Angola \$1; Cape Verde \$1.
Lime	4,084	--	Spain 2,250; Angola 1,548; Cape Verde 151.
Magnesium compounds, oxides and hydroxides	10	--	Norway 9; Mexico 1.
Mica:			
Crude including splittings and waste	4	--	Angola 3; Morocco 1.
Worked including agglomerated splittings value, thousands	\$3	--	Angola \$1; Mozambique \$1; Netherlands \$1.
Pigments, mineral, iron oxides and hydroxides, processed	74	--	Spain 39; Angola 21; Guinea-Bissau 9.
Precious and semiprecious stones other than diamond, natural value, thousands	\$90	--	Switzerland \$55; Germany \$34.
Quartz crystal, piezoelectric do.	\$8	--	All to France.
Salt and brine	13,048	274	Nigeria 6,755; Liberia 2,428; Germany 1,913.
Sodium compounds, n.e.s., soda ash, manufactured	3,967	--	Spain 3,550; France 282; Angola 115.
Stone, sand and gravel:			
Dimension stone:			
Crude and partly worked	477,257	876	Germany 139,449; Spain 136,421; France 41,288.
Worked	595,612	15,903	Germany 215,058; France 39,459; Denmark 35,826.
Dolomite, chiefly refractory-grade	7,477	--	Norway 7,475; Spain 2.
Gravel and crushed rock	12,383	--	France 6,354; Lebanon 3,006; Spain 2,191.
Limestone other than dimension	4	--	All to Angola.
Quartz and quartzite	40,557	--	Norway 39,095; Ireland 565; France 432.
Sand other than metal-bearing	96,869	--	Italy 59,866; Spain 33,682; Israel 1,677.
Sulfur:			
Elemental:			
Crude including native and byproduct	11,342	--	Lebanon 6,898; Slovenia 3,062; Spain 1,116.
Colloidal, precipitated, sublimed	8	--	Angola 6; Spain 2.
Sulfuric acid	213	--	Angola 135; Cape Verde 58; Congo (Kinshasa) 13.
Talc, steatite, soapstone, pyrophyllite	76	--	Angola 34; Saudi Arabia 20; Spain 15.
Other:			
Crude	4,071	--	Spain 4,065; Angola 3; Italy 2.
Slag and dross, not metal-bearing, granulated slag (slag sand) from iron and steel industry	19,995	--	All to Spain.
<b>MINERAL FUELS AND RELATED MATERIALS</b>			
Asphalt and bitumen, natural	19,638	--	Spain 19,521; Sao Tome and Principe 49; France 24.
Carbon black	22,938	--	Spain 19,826; Germany 1,055; Netherlands 684.
Coal, bituminous	8	--	All to Spain.
Coke and semicoke	83,840	--	Spain 31,958; Tunisia 27,797; Italy 13,242.
Petroleum:			
Crude 42-gallon barrels	80	--	All to Cape Verde.
Refinery products:			
Liquefied petroleum gas do.	678,878	--	Spain 300,800; Belgium-Luxembourg 275,407; Morocco 72,651.
Mineral jelly and wax do.	18,369	(2/)	Italy 9,035; Spain 8,988; Angola 134.
Asphalt do.	309,236	--	Spain 308,278; Sao Tome and Principe 951.
Bituminous mixtures do.	14,326	--	Cape Verde 6,557; Spain 5,133; Cuba 1,376.
Petroleum coke do.	154	--	All to Spain.
Unspecified thousand 42-gallon barrels	16,237	5,365	United Kingdom 1,279; Spain 1,229; unspecified 4,669.

1/ Table prepared by Glenn J. Wallace, International Data Unit.

2/ Less than 1/2 unit.

Source: United Nations Statistical Office (microfiche).

TABLE 5  
PORTUGAL: IMPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Sources	
		United States	Other (principal)
<b>METALS</b>			
Alkali and alkaline-earth metals:			
Alkali metals	value, thousands	\$27	-- Germany \$13; Netherlands \$8; United Kingdom \$5.
Alkaline-earth metals		39	-- Germany 24; Spain 14.
Aluminum:			
Ore and concentrate		2,008	-- Spain 1,654; France 265; Netherlands 89.
Oxides and hydroxides		8,687	63 Spain 5,570; France 2,192; Germany 383.
Metal including alloys:			
Scrap		944	-- Spain 628; Israel 280; Russia 23.
Unwrought		109,175	12 Norway 57,978; Spain 27,679; Netherlands 7,763.
Semimanufactures		40,490	102 Spain 11,327; Germany 10,852; France 4,897.
Antimony:			
Oxides		235	-- China 75; Spain 64; United Kingdom 29.
Metal including alloys, all forms		24	-- Spain 20; Netherlands 3; Belgium-Luxembourg 1.
Arsenic, metal including alloys, all forms		25	-- All from Spain.
Beryllium, metal including alloys, all forms	value, thousands	\$5	\$4 Italy \$1.
Bismuth, metal including alloys, all forms		2	-- Belgium-Luxembourg 1; Spain 1.
Cadmium, metal including alloys, all forms	value, thousands	\$1	-- All from unspecified Europe.
Chromium:			
Ore and concentrate		1,947	-- South Africa 924; Spain 527; Netherlands 496.
Oxides and hydroxides		185	-- Spain 102; Germany 52; Netherlands 20.
Metal including alloys, all forms		5	1 Germany 4.
Cobalt:			
Ore and concentrate	value, thousands	\$67	-- France \$31; Italy \$27; Spain \$9.
Oxides and hydroxides		8	-- Belgium-Luxembourg 4; United Kingdom 2; Finland 1.
Metal including alloys, all forms		32	-- Belgium-Luxembourg 12; France 12; Germany 6.
Copper:			
Oxides and hydroxides		242	-- Norway 160; Germany 80; Spain 2.
Sulfate		2,799	-- Spain 1,395; France 659; Italy 522.
Ash and residue		22	-- All from Netherlands.
Metal including alloys:			
Scrap		2,282	35 Spain 720; United Kingdom 411; South Africa 241.
Unwrought		2,532	9 Spain 1,564; Turkey 363; Germany 304.
Semimanufactures		76,929	117 Spain 35,423; Italy 9,298; France 8,882.
Gold:			
Waste and sweepings	value, thousands	\$14	-- All from United Kingdom.
Metal including alloys, unwrought and partly wrought	do.	\$61,805	\$362 Germany \$31,425; Spain \$20,061; France \$4,936.
Iron and steel:			
Ore and concentrate, excluding roast pyrite		590,097	-- Brazil 399,263; Canada 190,477; Netherlands 300.
Metal:			
Scrap		173,556	655 United Kingdom 120,497; Germany 17,270; Netherlands 7,995.
Pig iron, cast iron, related materials		38,466	81 Russia 20,912; Spain 6,956; Germany 3,316.
Ferroalloys:			
Ferrosilicon		1,037	-- Spain 306; Germany 289; Belgium-Luxembourg 251.
Ferromanganese		1,304	-- Spain 1,099; Germany 103; France 77.
Ferromolybdenum		111	-- Austria 69; Spain 28; Germany 10.
Ferroniobium		4	-- Germany 3; Spain 1.
Ferrosilicomanganese		6,304	-- All from Spain.
Ferrosilicon		4,360	-- Spain 2,511; Norway 643; Brazil 579.
Ferrotitanium and ferrosilicotitanium		9	-- United Kingdom 6; Germany 2; Spain 1.
Ferrotungsten and ferrosilicotungsten	value, thousands	\$2	-- All from Germany.
Ferrovandium	do.	\$15	-- Spain \$14; Germany \$1.
Silicon metal		31	-- Spain 30; Argentina 1.
Unspecified		3,342	-- Spain 2,972; France 321; Argentina 39.
Steel, primary forms		22,860	450 Germany 5,060; Brazil 1,714; Spain 1,418.
Semimanufactures:			
Flat-rolled products:			
Of iron or nonalloy steel:			
Not clad, plated, coated		971,799	282 Netherlands 151,803; Germany 107,586; Spain 97,959.
Clad, plated, coated		270,167	578 Spain 51,866; Germany 38,131; Italy 37,413.

See footnotes at end of table.

TABLE 5--Continued  
 PORTUGAL: IMPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Sources	
		United States	Other (principal)
METALS--Continued			
Iron and steel--Continued:			
Metal--Continued:			
Semimanufactures--continued:			
Flat-rolled products--continued:			
Of alloy steel	110,994	--	Germany 32,084; France 30,472; Spain 22,810.
Bars, rods, angles, shapes, sections	795,893	620	Spain 427,118; Italy 57,441; Belgium-Luxembourg 54,557.
Rails and accessories	33,839	--	France 16,826; Spain 10,856; Italy 2,963.
Wire	41,669	26	Spain 15,686; Belgium-Luxembourg 5,432; South Africa 5,304.
Tubes, pipes, fittings	178,978	44	Spain 85,269; France 37,897; Germany 22,827.
Lead:			
Ore and concentrate	14	--	All from United Kingdom.
Oxides	830	19	Spain 811.
Metal including alloys:			
Scrap	8	--	All from Spain.
Unwrought	28,072	--	Morocco 12,084; Bulgaria 5,425; United Kingdom 1,974.
Semimanufactures	348	--	Spain 94; Greece 83; France 77.
Lithium oxides and hydroxides	value, thousands	\$2	-- Sweden \$1; United Kingdom \$1.
Magnesium, metal including alloys:			
Unwrought	383	--	Norway 363; France 16; Italy 2.
Semimanufactures	value, thousands	\$52	\$36 Germany \$6; Switzerland \$5; United Kingdom \$3.
Manganese:			
Ore and concentrate	524	--	Netherlands 280; Greece 194; Spain 50.
Oxides	358	--	South Africa 220; Spain 87; Germany 30.
Metal including alloys, all forms	29	--	Germany 21; Italy 4; Netherlands 4.
Mercury	value, thousands	\$30	-- Germany \$25; Spain \$4; France \$1.
Molybdenum:			
Oxides and hydroxides	do.	\$3	\$3
Metal including alloys:			
Unwrought	9	1	Germany 8.
Semimanufactures	value, thousands	\$104	-- Germany \$60; Italy \$25; United Kingdom \$17.
Nickel:			
Matte and speiss	42	--	Spain 39; France 3.
Oxides and hydroxides	value, thousands	\$24	-- Spain \$21; France \$2.
Metal including alloys:			
Unwrought	356	--	Netherlands 113; United Kingdom 62; Canada 53.
Semimanufactures	111	(2)	Germany 49; Spain 27; France 9.
Platinum-group metals:			
Waste and sweepings	value, thousands	1	-- All from unspecified Europe.
Metal including alloys, unwrought and partly wrought:			
Palladium	do.	\$32	-- Belgium-Luxembourg \$20; Spain \$11.
Platinum	do.	\$168	-- Spain \$109; Austria \$31; Germany \$16.
Rhodium	do.	\$24	-- Italy \$15; Spain \$9.
Rare-earth, metals including alloys, all forms			
Selenium, elemental	7	--	Austria 1; Germany 1.
Silicon, high-purity	160	--	United Kingdom 3; Spain 2; Belgium-Luxembourg 1.
Silver, metal including alloys, unwrought and partly wrought	value, thousands	\$12,210	\$13 Germany \$4,424; United Kingdom \$3,549; Spain \$3,246.
Tantalum, metal including alloys, all forms	do.	\$111	\$25 Germany \$54; United Kingdom \$32.
Tin, metal including alloys:			
Unwrought	1,351	2	Spain 516; Germany 336; United Kingdom 135.
Semimanufactures	170	(2)	United Kingdom 112; Netherlands 34; Germany 18.
Titanium:			
Ore and concentrate	319	--	South Africa 306; Spain 13.
Oxides	3,475	60	Australia 1,142; Saudi Arabia 704; Belgium-Luxembourg 517.
Metal including alloys, all forms	86	58	Italy 15; Norway 8; Japan 2.
Tungsten:			
Ore and concentrate	value, thousands	\$23	-- Italy \$21; Germany \$2.
Metal including alloys:			
Unwrought	do.	\$104	\$29 Brazil \$67; France \$6; Germany \$1.
Semimanufactures	do.	\$666	\$3 Spain \$327; Belgium-Luxembourg \$155; France \$47.

See footnotes at end of table.

TABLE 5--Continued  
PORTUGAL: IMPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Sources	
		United States	Other (principal)
METALS--Continued			
Uranium and thorium, metal including all forms:			
Uranium	value, thousands	\$26	\$26
Thorium	do.	\$39	-- All from Belgium-Luxembourg.
Vanadium, oxides and hydroxides	do.	\$4	-- All from Germany.
Zinc:			
Ore and concentrate		400	-- All from Colombia.
Oxides		2,050	-- Spain 1,016; Colombia 360; United Kingdom 317.
Blue powder		576	-- Denmark 367; Belgium-Luxembourg 129; Spain 56.
Ash and residue		5,903	407 Spain 4,213; Norway 485; United Kingdom 440.
Metal including alloys:			
Scrap		54	-- All from Spain.
Unwrought		21,308	-- Spain 10,952; Belgium-Luxembourg 5,758; Norway 2,070.
Semimanufactures		6,399	2 Spain 2,785; France 897; South Africa 705.
Zirconium, ore and concentrate		4,375	18 Germany 1,896; Spain 1,145; Netherlands 936.
Other:			
Ores and concentrates		407	-- Netherlands 283; Spain 124.
Oxides and hydroxides		1,541	2 Spain 1,453; Germany 53; Belgium-Luxembourg 24.
Ashes and residues		966	-- All from Spain.
Base metals including alloys, all forms	value, thousands	\$5	-- All from Switzerland.
Precious metals, n.e.s., waste and scrap	do.	\$77	-- Spain \$65; Italy \$12.
INDUSTRIAL MINERALS			
Abrasives, n.e.s.:			
Natural, corundum, emery, pumice, etc.		2,529	19 Turkey 1,913; France 182; Spain 180.
Artificial:			
Corundum		1,610	4 France 748; Germany 313; Austria 262.
Silicon carbide		1,202	1 France 463; Denmark 255; Germany 211.
Dust and powder of precious and semiprecious stones including diamonds	value, thousands	\$3,788	-- Spain \$965; Belgium-Luxembourg \$694; Ireland \$572.
Grinding and polishing wheels and stones		2,493	12 Italy 1,188; Spain 551; Germany 259.
Asbestos, crude		6,302	-- Canada 5,162; Zimbabwe 377; South Africa 342.
Barite and witherite		3,656	-- Morocco 2,500; Netherlands 501; Spain 333.
Boron:			
Crude natural borates		14,400	-- Turkey 12,850; Spain 701; Argentina 565.
Oxides and acids		1,077	-- United Kingdom 708; Italy 168; Spain 118.
Cement	thousand tons	1,331	(2/) Ukraine 290; Italy 228; United Kingdom 173.
Chalk		2,980	-- France 1,870; Belgium-Luxembourg 479; United Kingdom 428.
Clays, crude:			
Bentonite		18,847	106 United Kingdom 5,496; Spain 5,435; France 5,121.
Chamotte earth and dinas earth		1,841	-- France 1,028; Spain 673; Netherlands 73.
Fire clay		260	-- Germany 147; Spain 110; Italy 3.
Fuller's earth		57	40 Spain 17.
Kaolin		121,639	700 United Kingdom 87,459; Spain 22,393; France 9,467.
Other		5,565	90 Spain 4,429; United Kingdom 716; Germany 165.
Cryolite and chiolite		45	-- Germany 44; Spain 1.
Diamond, natural:			
Gem, not set or strung	value, thousands	\$52,085	-- Belgium-Luxembourg \$40,677; United Kingdom \$5,514; Angola \$3,160.
Industrial stones	do.	\$2,211	-- Germany \$1,775; Spain \$214; Netherlands \$185.
Dust and powder	do.	\$3,706	-- Spain \$965; Belgium-Luxembourg \$620; Ireland \$572.
Diatomite and other infusorial earth		1,667	729 Spain 479; France 410; Italy 40.
Feldspar		31,026	-- Spain 17,568; France 8,963; India 2,306.
Fertilizer materials:			
Crude, n.e.s.		7,131	1 Spain 4,600; France 1,280; Israel 1,076.
Manufactured:			
Ammonia		20,028	-- Estonia 9,987; Algeria 9,971; Spain 60.
Nitrogenous		174,634	-- Netherlands 47,572; Germany 36,001; Spain 33,346.
Phosphatic		947	-- Spain 946; France 1.
Potassic		70,005	-- Israel 25,307; Spain 18,997; Jordan 14,350.
Unspecified and mixed		153,387	21 Spain 43,760; Netherlands 28,708; Tunisia 23,014.

See footnotes at end of table.

TABLE 5--Continued  
PORTUGAL: IMPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Sources	
		United States	Other (principal)
<b>INDUSTRIAL MINERALS--Continued</b>			
Fluorspar	1,381	--	Spain 894; France 366; Belgium-Luxembourg 69.
Graphite, natural	378	--	Spain 302; Germany 41; China 21.
Gypsum and plaster	276,003	36	Spain 240,658; Morocco 27,310; Germany 5,481.
Iodine	25	--	Belgium-Luxembourg 11; Netherlands 6; Japan 5.
<b>Kyanite and related materials:</b>			
Mullite	471	--	Netherlands 460; United Kingdom 11.
Unspecified	245	--	Spain 164; South Africa 80.
Lime	1,338	--	Spain 1,321; Germany 14; Denmark 3.
<b>Magnesium compounds:</b>			
Magnesite, crude	1,762	--	Spain 1,346; Italy 231; Greece 108.
Oxides and hydroxides	2,597	--	Spain 1,168; Netherlands 654; Italy 386.
Other	63	--	All from India.
<b>Mica:</b>			
Crude including splittings and waste	110	--	France 51; United Kingdom 31; Norway 18.
Worked including agglomerated splittings	18	(2/)	Kenya 8; Switzerland 5; Belgium-Luxembourg 2.
Nitrates, crude	754	--	Belgium-Luxembourg 742; Spain 8; Germany 4.
Phosphates, crude	183,954	--	Syria 154,063; Tunisia 20,100; Algeria 5,500.
Phosphorus, elemental	7	--	All from Germany.
<b>Pigments, mineral:</b>			
Natural, crude	14	--	France 7; Spain 5; United Kingdom 2.
Iron oxides and hydroxides, processed	2,344	--	Germany 1,075; Spain 763; Italy 118.
<b>Precious and semiprecious stones other than diamond:</b>			
Natural	value, thousands	\$1,255	\$17 Germany \$322; Switzerland \$153; Brazil \$151.
Synthetic	do.	\$1,345	-- Switzerland \$357; Spain \$330; United Kingdom \$249.
Pyrite, unroasted		132	-- United Kingdom 80; Spain 52.
Quartz crystal, piezoelectric	value, thousands	\$34	-- Spain \$27; Italy \$6; Thailand \$1.
Salt and brine	105,823	2	Spain 42,769; France 38,916; Netherlands 8,152.
<b>Sodium compounds, n.e.s.:</b>			
Soda ash, manufactured	35,773	--	Spain 35,275; France 471; Germany 26.
Sulfate, manufactured	45,398	--	Spain 45,189; France 203; Germany 5.
<b>Stone, sand and gravel:</b>			
<b>Dimension stone:</b>			
Crude and partly worked	76,258	91	Spain 39,356; South Africa 14,997; Brazil 7,763.
Worked	33,124	1	Spain 27,588; Sweden 1,529; Italy 1,487.
Dolomite, chiefly refractory-grade	9,770	2	Spain 7,454; Germany 1,591; United Kingdom 456.
Gravel and crushed rock	216,561	3	Spain 210,308; France 4,343; Italy 1,781.
Limestone other than dimension	1,659	--	France 1,652; Netherlands 7.
Quartz and quartzite	557	--	Italy 473; Germany 30; Spain 29.
Sand other than metal-bearing	121,038	55	Spain 117,568; Belgium-Luxembourg 1,960; France 858.
<b>Sulfur:</b>			
<b>Elemental:</b>			
Crude including native and byproduct	2,468	--	Spain 2,088; France 325; Belgium-Luxembourg 50.
Colloidal, precipitated, sublimed	4,576	--	Tunisia 2,592; Spain 1,952; France 25.
Dioxide	4,562	--	Sweden 3,835; Spain 716; Germany 11.
Sulfuric acid	172,649	1	Spain 118,939; United Kingdom 22,103; Germany 11,687.
Talc, steatite, soapstone, pyrophyllite	14,432	254	Spain 6,994; France 3,542; Belgium-Luxembourg 1,494.
Vermiculite, perlite, chlorite	991	--	France 707; South Africa 172; Spain 110.
<b>Other:</b>			
Crude	38,841	560	Spain 33,120; United Kingdom 1,551; Finland 914.
<b>Slag and dross, not metal-bearing:</b>			
Granulated slag (slag sand) from iron and steel industry	10,641	--	All from Spain.
Waste, scale, dross, slag of iron or steel industry	2,006	--	Do.
Slag and ash, n.e.s., including seaweed ash (kelp)	82,731	--	Spain 82,451; France 258; Italy 21.

See footnotes at end of table.

TABLE 5--Continued  
 PORTUGAL: IMPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Sources	
		United States	Other (principal)
<b>MINERAL FUELS AND RELATED MATERIALS</b>			
Asphalt and bitumen, natural	9,905	--	France 7,810; Spain 1,982; Germany 54.
Carbon black	5,520	--	Spain 2,297; Germany 2,034; France 832.
Coal:			
Anthracite	336,726	--	South Africa 336,711; Netherlands 15.
Bituminous	thousand tons 4,645	759	Colombia 1,756; South Africa 1,325; Venezuela 272.
Lignite including briquets	1	--	All from Germany.
All grades including briquets	thousand tons 4,990	759	Colombia 1,756; South Africa 1,667; Venezuela 272.
Coke and semicoke	13,022	--	Spain 8,655; France 2,402; Germany 1,964.
Gas, manufactured	value, thousands \$1	\$1	
Gas, natural, gaseous	613,427	--	All from Spain.
Peat including briquets and litter	11,843	--	Germany 6,006; Ireland 2,713; Netherlands 1,420.
Petroleum:			
Crude	thousand 42-gallon barrels 98,441	578	Saudi Arabia 19,260; Iran 16,924; Nigeria 16,500.
Refinery products:			
Liquefied petroleum gas	do. 14,359	69	Spain 7,591; United Kingdom 5,056; Libya 378.
Mineral jelly and wax	42-gallon barrels 101,436	165	Spain 56,955; China 19,211; Germany 17,889.
Asphalt	thousand 42-gallon barrels 1,875	--	Spain 1,533; France 316; unspecified 25.
Bitumen and other residues	do. 1,931	--	Spain 1,534; France 316; unspecified 74.
Bituminous mixtures	42-gallon barrels 57,982	(2/)	Spain 46,008; France 7,714; United Kingdom 3,030.
Petroleum coke	thousand 42-gallon barrels 2,211	1,036	Venezuela 544; Aruba 435; Spain 184.
Unspecified	do. 21,043	163	Spain 5,068; United Kingdom 3,477; Netherlands 1,943.

1/ Table prepared by Glenn J. Wallace, International Data Unit.

2/ Less than 1/2 unit.

Source: United Nations Statistical Office (microfiche).