

# THE MINERAL INDUSTRY OF

# MEXICO

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In 1999, Mexico's gross domestic product (GDP) increased by 3.7%, higher than expected by the Government at the beginning of the year. The GDP growth was the result of such international events as a significant increase in the petroleum price, a dynamic U.S. economy, and the Asian economic recovery. Inflation decreased to 12.3% from 18.6% in 1998, the lowest level since 1994. The value of total exports increased by 16.4% to \$136.7 billion,<sup>2</sup> and imports increased at the lower pace of 13.3%. Investment and private consumption increased by 9% and 4.3%, respectively. Direct foreign investment exceeded \$11.6 billion, a 16% increase from 1998 (Secretaría de Comercio y Fomento Industrial, 2000, p. 8-12).

Total investment in the mining-metallurgical sector by companies associated with the Cámara Minera de México (Mexican Chamber of Mines) decreased by 24.7% to \$795 million (Cámara Minera de México, 1999, p. 26; 2000, p. 38). About 84% of the investment was from four of the largest Mexican mining-metallurgical companies. Almost 42% of the investment was by Grupo México S.A. de C.V. (Grupo México), which was the largest copper producer.

Mexico's mining-metallurgical sector was affected by the lower international prices that prevailed during 1999. The prices of most of Mexico's mineral commodities of higher accumulated value, nonferrous and precious metals, decreased. The notable exemption was the price of copper, which increased slightly. Sand and gravel combined replaced copper as the highest value nonfuel mineral commodity with 17% of the total mining-metallurgical production of \$3.78 billion, and copper was second with 15% (Ing. Javier Moya Ruíz, Minerals Specialist, U.S. Embassy, Mexico City, oral commun., December 2000).

## Government Policies and Programs

Under the Mexican Constitution, minerals are part of the national patrimony. Under article 27 of the constitution, the mining law is the Government legislation that governs Mexico's mining industry. The Mining Law of 1992 became effective in September 1992 and was amended in 1996 (Mexican Mining Information Center, [undated], Modification to Mexico's Federal mining law, accessed January 5, 2000, at URL

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<sup>2</sup>Where necessary, values have been converted from Mexican pesos (Mex\$) to U.S. dollars at the rate of Mex\$9.561=US\$1.00.

<http://mexmin.com/lawmod.asp>). The amendment was published in the daily official register on December 24, 1996.

The Mining Law covers exploration, production, and beneficiation of minerals. It removes many of the restrictions of the previous law regarding the participation of private and foreign companies in the Mexican mining industry at a time when the Government was privatizing State mining companies and decontrolling its mining reserves. The Mining Law permits direct investment with up to 100% ownership of equity, in exploration works and activities and allowed up to 100% foreign participation in production through a 30-year trust mechanism.

This law permits the participation of the private sector in the production of some minerals previously reserved to the Government, such as coal, iron, phosphorus, potassium, and sulfur. Minerals or substances exempted from the law are hydrocarbons, radioactive minerals, substances contained in suspension or dissolution in subterranean waters as long as they did not originate from mineral deposits different from the components of the land, rocks or their fragmentation that could only be used for the fabrication of materials for construction or ore destined for such purposes, products derived from the fragmentation of the rocks mined principally by open pit, and salt formed by evaporation of brines from salt pits.

The exploration concessions are awarded for 6 years and are not renewable. Exploitation concessions are awarded for 50 years and are renewable for a similar period. The 1992 law eliminates the concession for ore beneficiation plants.

On February 15, 1999, revisions to the mining regulations were published in the *Diario Oficial de la Federación* (Official Diary of the Federation). The new regulations were geared to increase the participation of the private sector in mining and the competitiveness of the mining companies in Mexico (Secretaría de Comercio y Fomento Industrial, 2000, p. 34). The regulations decreased the administrative procedures by 20% and established time limits for most of the procedures. The regulation also established automatic approval when no Government response has been received by the expiration of the time limit. The Public Service Manual on Mining-Related Issues was published in July 1999. The manual established administrative procedures for all mining matters of the mining law and its regulations.

In 1994, the responsibility for the mining sector was transferred to the Secretaría de Comercio y Fomento Industrial (SECOFI). SECOFI's Dirección General de Minas was responsible for revisions to the Mining Law and its regulations.

The reduction of lands in the mining reserves, which began in 1997 and intends to make 454,911 hectares (ha) available to the private sector, continued through 1999. During the year, the Government awarded three mining projects that totaled 24,627 ha in the States of Guerrero, Jalisco, and Sonora through competitive bids.

## Environmental Issues

Although various environmental laws and regulations have been promulgated since 1946, protection of the environment became a priority for the Government of Mexico as the population has increased and the mining industry has grown in size and importance. Accordingly, *La Ley General del Equilibrio Ecológico y Protección al Ambiente* (the General Law of Ecological Balance and Environmental Protection) (LGEEPA), a key element of environmental legislation, was passed in 1992 (Ordal and Moya, 1996, p. 5). Environmental responsibilities that resided in various Government agencies were transferred to the *Secretaría del Medioambiente, Recursos Naturales, y Pesca* (SEMARNAP) (Ministry of Environment, Natural Resources, and Fisheries) in 1994. Enforcement of environmental regulations is buttressed by the Environmental Attorney's Office.

Under SEMARNAP, mineral exploration and mining required a number of environmental permits and authorizations to conform to the statutes of LGEEPA starting with a preliminary environmental impact statement for all major activities or projects. Besides an operating license, the necessary permits for any mine or plant included water well usage, water discharge, land use, explosives, and hazardous materials handling. Other regulations were concerned with noise, gas and dust emissions, dumps and tailings, storage of oil and fuel, and electrical transformers.

Water-discharge regulations were specified in the Federal Law Concerning Water Rights (LFDMA) of January 1992 and the National Water Law of December 1992. According to the LFDMA, water pumped from mining works is not subject to discharge fees as long as it is not used in the "exploitation and/or metallurgical treatment of ore" or for other industrial or domestic use. Discharge fees, however, are required for water that contains more than 2,500 milligrams per liter of total dissolved solids, unless the discharged water can meet the minimum quality standards set by the Consejo Nacional de Agua (CONAGUA). Although water discharged to runoffs or water basins is also exempted from payments of a discharge fee if it meets CONAGUA water-quality standards, all other types of water discharge require payment of a fee according to schedules set in the LFDMA.

In 1998, SEMARNAP published the Norma Oficial Mexicana NOM-120-ECOL.1997 in the *Diario Oficial de la Federación*. The law established environmental protection for direct mining activities in a dry and temperate climate with xerophilous underbrush, deciduous tropical forests, coniferous forests, and holm oaks. In January 1999, a clarification of the law was published by SEMARNAP.

## Production

An important mineral producer, Mexico ranked among the top world producers in a variety of nonfuel minerals. It was the world's leading producer of silver and celestite and a significant supplier of mining and mineral products to the United States (table 1). According to the U.S. Geological Survey world production data, in 1999, Mexico maintained its position as a world producer—bismuth and fluor spar, 2d; arsenic, graphite, arsenic, and molybdenum, 4th; cadmium, 5th; barite, gypsum, lead (mine), and zinc (mine), 6th; salt, 7th; sulfur, 9th;

manganese ore (metal content), 10th; copper (mine) and cement, 11th; and crude steel, 15th. Mexico lost significant ground in the production of gold, going from 14th in 1998 to 19th in the world in 1999.

In 1999, the total value of Mexico's mining production in 1999 prices was \$3.78 billion; metals contributed 55.4% of the total, or \$2.1 billion (Ing. Javier Moya Ruíz, Minerals Specialist, U.S. Embassy, Mexico City, oral commun., December 2000). At \$644, sand and gravel (combined) were the highest value of all nonfuel mineral commodities (including coal). Individually, copper, which continued to be the most important mineral commodity, contributed \$570 million, or about 27% of the metal value. Silver and zinc followed with 10.9% and 10.5%, respectively, of the total mining-metallurgical production value. The value of coal production was \$220 million, or 5.8% of total mining-metallurgical value and about 13% of industrial mineral value (Ing. Javier Moya Ruíz, Minerals Specialist, U.S. Embassy, Mexico City, oral commun., December 2000).

In terms of value, four States produced 43% of Mexico's mineral production (Consejo de Recursos Minerales, 2000, p. 24). The State of Sonora, the leading producer of copper, gold, and graphite, was the overall leading producer with 16.9% of the total; followed by the State of Coahuila, the leading producer of antimony, bismuth, and coal (9.3%); the State of Zacatecas, the leading producer of silver (8.6%), and the State of Chihuahua, the leading producer of cadmium, lead, and zinc and the only producer of tungsten (8.5%).

Petroleum continued to dominate Mexico's mineral sector. *Petróleos Mexicanos S.A. de C.V.* (PEMEX), Mexico's national petroleum company, had revenues of \$33.4 billion (*Petróleos Mexicanos S.A. de C.V.*, 2000, p. 121) and provided \$23 billion in direct and indirect taxes, more than two-thirds of the total (*Petróleos Mexicanos S.A. de C.V.*, 2000, p. 123). With Venezuela's decrease in production of crude petroleum, Mexico became the world's sixth largest producer in 1999. In the Western Hemisphere, only the United States produced more crude petroleum during the year.

## Trade

In 1999, Mexico's total exports were valued at \$136.7 billion. Of that total, the value of mining exports, which included coke, accounted for \$2.53 billion (in current prices), or 1.9% of the total. The value of metal exports totaled \$2.04 billion, or 81% of mining exports. Total imports were valued at \$142.06 billion. Of that total, mining, which included coke, accounted for \$2.34 billion, or 1.6% of the total. The value of imports of metals and industrial minerals (nonmetals) increased by 3.9% in 1999, the slowest increase since 1995. The value of imports in 1999, however, were more than four times that of 1995. The value of exports of metal and industrial minerals increased by 3.2% and 7%, respectively. The value of imports of metals increased by 7% and those of industrial minerals decreased by about 1.7% (Consejo de Recursos Minerales, 2000, p. 26, 27, 28).

Silver was the largest source of foreign exchange with \$474 million, or 18.7% of total metal and industrial minerals exports, which included coal and coke, followed by platinum (\$365 million), gold (\$327 million), and copper (\$241 million). Marble led the exports of industrial minerals, including coal,

with \$79 million. In terms of value, the United States received 79% of Mexico's mining exports followed by the United Kingdom (4%) and Japan (3.8%) (Consejo de Recursos Minerales, 2000, p. 121, 124).

Metal imports were led by copper and iron with 16.7% and 16.5%, respectively, of the value of total metal and industrial mineral imports, which included coal and coke. Industrial mineral imports were led by coal and coke with 5.8% and 4%, respectively, of the value of total metal and industrial mineral imports. In terms of value, Mexico received 53.1% of its mineral requirements from the United States, followed by Chile (13.9%) and Brazil (5.5%) (Consejo de Recursos Minerales, 2000, p. 127, 132).

Mexico exported 567 million barrels (Mbbbl) of crude petroleum for a value of \$8.9 billion. Despite of a significant increase in the exports of natural gas (more than threefold), Mexico was a net importer of natural gas and refinery products. Of the total crude exports, 75.4% of the petroleum exported went to the United States followed by Spain (7.9%), the Netherlands Antilles (7.8%), and Japan (2.7%). About 2% of Mexico's exports went to countries ascribed to the San José Accord. The average export price for Mexican crude was \$15.62, a 34.9% increase from that of 1998 (Petróleos Mexicanos S.A. de C.V., 2000, p. 261, 262, 263, 265).

### Structure of the Mineral Industry

Since 1994, Government responsibilities for the mining sector were transferred from the Secretaría de Energía, Minas e Industrial Paraestatal (SEMIP), to SECOFI. SEMIP then became the Secretaría de Energía and retained the responsibilities for petroleum and electricity.

The Coordinación General de Minería which is SECOFI's highest office, is charged with mining policies with the purpose of fostering new investment and maintaining a healthy mining sector. It is supported by the Dirección General de Minas, the Dirección General de Promoción Minera, the Fideicomiso de Fomento Minero, and the Consejo de Recursos Minerales (CRM). The main functions of the Dirección General de Minas are to award mining concessions and to maintain the national mining and mapping registers. The Dirección General de Promoción Minera is responsible for promotion of the mining sector, including incentives for the domestic and foreign investment in the sector. The Fideicomiso de Fomento Minero is responsible for financial, administrative, and technical assistance to the mining sector by the Government. CRM is responsible for integrating the inventory of Mexico's national resources.

The Cámara Minera de México (Mexican Mining Chamber) is another important organization in Mexico's mining sector. It promotes the interest of the private sector and maintains the dialogue between the private mining sector and the Government.

In 1998 (the last year for which information was available), the mining industry employment totaled 129,677 (Instituto Nacional de Estadística, Geografía e Informática, 2000). Nearly all miners were represented by the Sindicato Nacional de Trabajadores Mineros, Metalúrgicos y Similares de la República Mexicana. The Confederación de Trabajadores de México, the largest Mexican Union, represented the cement employees.

Five large diversified companies—Corporación Industrial San

Luis S.A. de C.V., Empresas Frisco S.A. de C.V., Industrias Peñoles S.A. de C.V. (Peñoles), Grupo México, and the Grupo Acerero del Norte S.A. de C.V. (GAN)—dominated the production of nonfuel minerals (table 2). These companies operated about 40 mining units throughout the country. The medium-sized mining sector operated 20 mining units and produced 100% of the celestite, feldspar, fluorspar, gypsum, and silica sand and almost 90% of graphite. The small-sized mining sector operated 170 mining units and produced almost 75% of the kaolin.

Interest in exploration of Mexico's mineral resources continued in 1999 when SECOFI issued 2,000 mining concession titles. Of these, 1,715 were for exploration, and 285, for production. During the year, 92 new companies were registered in the public mining registry, of which, 43 were domestically owned companies and 49 with foreign participation. The number of foreign mining companies operating in Mexico was 486,42 more than in 1998. Most of these companies were from Canada (206) and the United States (192) (Secretaría de Comercio y Fomento Industrial, 2000, p. 37, 39, 56). Exploration by foreign companies was in 17 States, with the main interest being in the States of Chihuahua, Sonora, and Zacatecas.

Mexico's cement industry was dominated by Cementos Mexicanos S.A. de C.V. (CEMEX), the world's third largest producers of cement. Cementos Apasco S.A. de C.V. and Cooperative Manufacturera de Cemento Portland La Cruz Azul S.C.L. were also important producers of cement in Mexico.

The production of crude petroleum, natural gas, and basic petrochemicals, also reserved for the Government under Article 27 of the Constitution, was entrusted to the State company PEMEX. It operated through Pemex Exploración y Producción (Pemex Exploration and Production), Pemex Refinación (Pemex Refining), Pemex Gas y Petroquímica Básica (Pemex Gas and Basic Petrochemicals), and Pemex Petroquímica (Pemex Petrochemicals), and Pemex Internacional (Pemex International). At yearend 1999, PEMEX's total employment was about 133,000.

### Commodity Review

#### Metals

**Bismuth.**—Bismuth mine and refinery production decreased by 54% and 60%, respectively. As a result, Mexico was replaced by Peru as the world's leading mine producer and ranked fifth in refinery production after China, Peru, Belgium, and Japan. Delays in work at the Met-Mex Peñoles S.A. de C.V. refinery in Torreón where the company was upgrading its ventilation system resulted in the reduction of refinery output, which at 412 metric tons (t) was significantly lower than the company's forecast in May (Metal Bulletin, 1999f).

**Copper.**—Mexico's copper mine production decreased slightly to about 381,000 t of copper, or almost 3% of the world mined copper in 1999. More than 80% of the production came from the State of Sonora where two large mining companies, Mexicana de Cobre S.A. de C.V. and Mexicana de Cananea S.A. de C.V., both subsidiaries of Grupo México, are located. The largest producer was La Caridad mine of Mexicana de Cobre, with an output of 175,084 t, this included 22,224 t of

electrowon copper, a 1% decrease from 1998 output. Cananea, owned by Mexicana de Cananea, was the second largest producer with an output of 113,338 t, this included 22,147 t in electrowon copper, a 15% decrease from 1998 output (Grupo México S.A. de C.V., 2000, p. 16, 18). The second largest producing State was Zacatecas (22,258 t), where the San Martín mine is located (Consejo de Recursos Minerales, 2000, p. 156). The San Martín mine was owned by Industrial Minera México, another subsidiary of Grupo México.

A strike at the Cananea mine, which began in late 1998, continued until February 17, 1999. The stoppage, which lasted 42 days in 1998 and 48 days in 1999 was the reason for the 15% reduction in mine output in 1999 (Grupo México S.A. de C.V., 2000, p. 19). The strike was partly because of a productivity pay dispute and job losses that resulted from the company's plan to close the smelter (Metal Bulletin, 2000).

Mexico's copper primary smelter production was 352,700 t. The smelter at La Caridad metallurgical complex, which was expanded to 330,000 t in 1998, began to receive Cananea's concentrate after the latter's smelter was closed. Grupo México planned to expand the smelter capacity to 400,000 t at La Caridad by the second quarter of 2001 (Grupo México S.A. de C.V., 2000, p. 38).

In November 1999, Grupo México became the world's third largest copper producer when it acquired ASARCO Incorporated for \$2.5 billion. Asarco had mines and plants in the United States and Peru and included a 54.2% interest in Southern Peru Copper Corporation (Grupo México S.A. de C.V., 2000, p. 4).

In May, Cobre de Pasteje, one of Mexico's refineries in Mexico City, reduced its production capacity by 20,000 t by closing the part of the refinery that used blister to produce cathode. The company had been receiving blister from Mexicana de Cananea's smelter in Sonora, which was closed in late 1998. The company production capacity from scrap was 40,000 t (Metal Bulletin, 1999b).

Corporación Nacional del Cobre de Chile (CODELCO) and Peñoles signed an agreement to explore for copper in the State of Sonora. Under the joint-venture agreement, Peñoles would operate any deposits smaller than 1 million metric tons (Mt). The companies would jointly manage larger deposits. During the first year of exploration, CODELCO and Peñoles planned to spend \$2 million (Mining Journal, 1999b).

Peñoles also signed an memorandum of understanding with BacTech Metallurgical Solutions Ltd. of Toronto and Mintek of South Africa to build and operate commercial plants for base-metal bioleach technology (Mining Journal, 1999a). Peñoles agreed to finance the early part of the development, which would include a pilot plant for copper recovery and, later, other base metals. The venture also included a feasibility study to build a 15,000-t commercial plant in Mexico. Peñoles was going to invest \$4.4 million in the copper pilot plant (Metals & Minerals Latin America, 1999b). The pilot plant would be completed in 8 months. The agreement also made it possible for Peñoles to share in the exclusive technology rights in Mexico and other five Latin American countries (BacTech Metallurgical Solutions Ltd., 1999a).

In November, BacTech announced that it had begun with work leading to the design and construction of a copper bioleach pilot plant in Monterrey, State of Coahuila, where Peñoles has its metallurgical complex (BacTech Metallurgical

Solutions Ltd., 1999b).

Grupo México completed a feasibility study at El Arco copper deposit in the State of Baja California Norte. The company, however, was not proceeding with further studies because of low copper prices. According to analysts, the deposit, which is inaccessible because of lack of infrastructure, would require copper prices at \$0.90 to \$1.00 per pound. Development of El Arco would require \$1.3 billion with an estimated 50% to 60% of the cost going to infrastructure. Reserves of El Arco are about 1 billion metric tons with an average grade of 0.47% copper and 0.14 grams per ton (g/t) gold (Metal & Minerals Latin America, 1999a).

**Gold and Silver.**—Mine production of gold and silver decreased by 6.6% and 8.2%, respectively. The State of Sonora produced 34% of the gold produced in Mexico followed by the States of Durango (20%) and Guanajuato (12%). The largest producer of gold was La Herradura, a new open pit mine which began production in 1998 in the State of Sonora. La Herradura was owned by Minera Penmont S. de RL. de C.V., a joint venture between Peñoles (56%) and Newmont Gold Co. (44%). Gold production from La Herradura was about 2,800 kilograms (kg) (reported as 90,300 ounces) at a total cash cost of \$159. Proven and probable reserves were 46.07 Mt with 0.79 g/t gold and 4 g/t silver (Industrias Peñoles S.A. de C.V., 2000, p. 12., Newmont Gold Co., 2000, p. 15). Production was expected to increase to almost 4,700 kg (reported as 150,000 ounces) by 2001.

La Ciénega gold, silver, lead and zinc mine, a wholly owned subsidiary of Peñoles, located in the State of Durango, was the second largest gold producer with about 2,300 kg (75,000 ounces). La Ciénega's proven and probable reserves at yearend 1999 were 4.17 Mt with 5.39 g/t gold, 141 g/t silver, 1.82% lead, and 2.05% zinc (Industrias Peñoles S.A. de C.V., 2000, p. 34).

In 1999, Grupo México completed the construction of a gold and silver refinery in the Mexicana de Cobre metallurgical complex in the State of Sonora with a capacity of 467,000 kilogram per year (kg/yr) (reported as 15 million ounces per year) of silver and 3,100 kg/yr (reported as 100,000 ounces per year) of gold (Grupo México S.A. de C.V., 2000, p. 38).

In November, a feasibility study was completed on Minera San Xavier S.A. de C.V.'s Cerro San Pedro gold and silver heap-leach project in the State of San Luis Potosí by Cambior de México S.A. de C.V., a wholly owned subsidiary of Cambior Inc. of Canada and a partner in the project with Metallica Resources Inc. The minable reserves of 63.5 Mt were calculated at gold and silver prices of \$300 per ounce and \$5.50 per ounce, respectively, with a grade of 0.62 g/t gold and 24.50 g/t silver. The project had an expected mine life of 8 years with an average production of about 4,900 kg/yr of gold equivalent (reported as 157,000 ounces per year). Recovery rates were 71% for gold and 43% for silver (Metallica Resources Inc., 2000, p. 5).

Cambior and Metallica had entered into an agreement in 1998 to each own 50% of Minera San Xavier. For Cambior to maintain this equity, it had to contribute \$20 million toward the project development by yearend 2000. Under this agreement, Cambior de México was the manager and operator of the project. At yearend, it was unclear if Cambior would be able to meet the terms of its agreement with Metallica as the company

reached an agreement to restructure its financial obligations (Cambior Inc., 1999).

Zacatecas, the State where Peñoles' Proaño/Fresnillo mine is located, continued to be Mexico's leading producer of silver with 37.5% of the total followed by the States of Chihuahua (13.8%) and Durango (13.5%). Proaño, owned by Peñoles' wholly owned subsidiary, *Compañía Fresnillo S.A. de C.V.* (Cía. Fresnillo), produced about 659,400 kg (21.2 million ounces) at an average cost of \$1.93 per ounce for the past 4 years of operation. In 1999, milling capacity at Proaño was increased from 900,000 metric tons per year (t/yr) to 1.2 million tons per year at an investment of \$21.7 million. Production at Proaño is expected to increase by 224,000 kg (reported as 7.2 million ounces). Of Proaño's production in 1999, 5,900 kg was from its new plant that recovers silver from old tailings; the plant was completed in August. Production from the tailings plant was expected to increase to about 56,000 kg in 2000 (*Industrias Peñoles S.A. de C.V.*, 2000, p. 12-13). Proaños proven and probable reserves at yearend 1999 were 9.24 Mt with 1.04 g/t gold, 732 g/t silver, 0.59% lead, 1.10% zinc, and 0.03% copper (*Industrias Peñoles S.A. de C.V.*, 2000, p. 34).

**Iron and Steel.**—Production of steel increased by 7.9% to 15.3 Mt. Production has increased by 91% since 1991 (the last year of Government participation in production) mainly as a result of the privatization of Mexico's steel sector. In 1999, almost 66% of the production was from three companies in the States of Coahuila, Michoacán, and Nuevo León. In 1999, Ispat Mexicana S.A. de C.V. in Lázaro Cárdenas, Michoacán, a subsidiary of Ispat International N.V., became Mexico's largest producer with an output of 3.6 Mt. The second largest producer was AHMSA of GAN with 3.38 Mt followed by Hylsamex S.A. de C.V. with almost 3.1 Mt (*Cámara Nacional del Hierro y el Acero*, 2000, p. 9, 14). *Siderúrgica Lázaro Cárdenas-Las Truchas S.A. de C.V.* (Sicartsa), the fourth largest producer, had plans to increase its steel production capacity to 2.35 Mt (*Metal Bulletin Monthly*, 1999b).

In 1999, AHMSA's rate of investment in its modernization and capacity expansion came to a halt when the company was unable to meet its \$1.8 billion debt commitments (*Metal Bulletin Monthly*, 1999a). The company, which had a capital expenditure program of \$300 million in 1999-2000, was forced to sell off some of its facilities. In May, AHMSA and its parent company GAN were granted protection from creditors under bankruptcy laws (*Metal Bulletin*, 1999a). The Mexican Government refused to rescue the companies (*Wall Street Journal*, 1999). With the planned reduction in steel output, workforce, and spending, AHMSA was hoping to increase its operating margin in an effort to restructure its debts (*Metal Bulletin*, 1999c). During the year, AHMSA held discussions with two other Mexican steel producers *Industrial Monterrey S.A. de C.V.* and *Hylsamex* (two other Mexican steel producers) and Spain's *Acerías S.A.* regarding a possible merger.

Apparent consumption of liquid steel increased to 13.8 Mt; this was 6% increase compared with that of 1998 and a 82.9% compared with that of 1995, the year after the Peso crisis and when steel demand decreased by about 43%. In 1999, Mexico was a net exporter of steel products and raw material, except for primary iron (*Cámara Nacional del Hierro y el Acero*, 2000, p. 25, 35, 38).

**Lead and Zinc.**—Mine production of lead and zinc decreased by 24% to 125,656 t and by 8% to 362,811 t, respectively. The State of Chihuahua was the leading producer of lead with 55% of the total followed by Zacatecas (17%) and Durango (8%). Chihuahua and Zacatecas were also the leading producers of zinc with 38% and 27.5% of Mexico's total zinc production, respectively.

Naica in Saucillo, the State of Chihuahua, a subsidiary of Peñoles through Cía. Fresnillo, was the largest producing mine. It produced about 36,000 t in 1999, an 8% decrease from that of 1998. Santa Bárbara also in the State of Chihuahua, a subsidiary of Grupo México, was the second largest producer of lead with 16,500 t.

San Martín in Sombrerete, the State of Zacatecas, a subsidiary of Grupo México through *Industrial Minera México S.A. de C.V.* (IMMSA), was the largest zinc mine with an output of 60,300 t. Charcas in the State of San Luis Potosí, another subsidiary of Grupo México through IMMSA, was the second leading producer with more than 47,000 t.

Peñoles concluded its exploration phase of the Francisco I. Madero zinc project in the State of Zacatecas, the largest zinc discovery in Mexico's history (*Industrias Peñoles S.A. de C.V.*, p. 8-9). The company identified reserves of 34 Mt with 1.7 Mt of zinc. Production from the mine was expected to begin in the third quarter of 2001 with an output of 110,000 t of contained zinc. Total investment for the project was estimated to be \$127 million. Peñoles also expected to begin production in its Rey de Plata zinc, lead, and silver project, a joint project with Dowa Mining Ltd. (39%) and Sumitomo Corporation (10%), both of Japan. The \$45 million project, scheduled for completion by the second quarter of 2000, has reserves of 3 Mt with 250,000 t of zinc. Zinc production from this project was projected to be 20,000 t/yr (*Industrias Peñoles S.A. de C.V.*, p. 9).

At yearend, Grupo México was carrying a feasibility study on a zinc, copper, and silver concentrator to produce from 6,000 to 8,000 metric tons per day at its Buenavista deposit near its Cananea mine in the State of Sonora. The sulfide deposit contains more than 100 Mt with an average grade of 1.6% zinc, 0.6% copper, and 20 g/t silver (*Metals & Minerals Latin America* 1999a).

Production of primary refined lead and zinc decreased by 33% and 5%, respectively. The large decrease in refined lead production was due, in part, to the decrease in production from Met-Mex Peñoles in Torreón, where limits in production levels were imposed for more than 6 months of 1999 by Profepa, Mexico's environmental agency, because of studies that showed high levels of lead in the blood of children who live near the metallurgical complex (*Metal & Minerals Latin America*, 2000). Met-Mex was restricted to produce at 50% capacity from May until October when it was allowed to produce at 75% until yearend. In addition to reduced sulfur dioxide and lead dust emissions, Met-Mex's environmental program included building a \$6.5 million medical center for the community, and roofing concentrate delivery areas and stockpiles (*Metal Bulletin*, 1999e). Total 1999 cost to remediate historical contamination and to purchase of houses and land to provide a buffer zone was \$17.5 million; this included the cost of the medical center (*Industrias Peñoles S.A. de C.V.*, 2000, p. 17).

Peñoles was investing \$121.8 million to expand the production capacity of Met-Mex zinc refinery to 220,000 t/yr from 130,000 t/yr. The expansion was expected to be

completed in mid-2000 (Industrias Peñoles S.A. de C.V., 2000, p. 17).

Grupo México announced preliminary plans to build a new 110,000-t/yr zinc refinery. The company, which owned a zinc refinery in the State of San Luis Potosí, would double its capacity with the new plant. The site for the \$250 million plant had not been announced at yearend, but the company was looking for a location near an inexpensive and reliable source of energy (Metal Bulletin, 1999d). Work to recondition Grupo México's San Luis Potosí zinc refinery began during the third-quarter of the year and was nearly completed at yearend. With the changes, the refinery would be able to process a wider variety of concentrates and to increase metal recovery (Grupo México S.A. de C.V., 2000, p. 20).

**Molybdenum.**—The only producer of molybdenum in Mexico was Grupo México through its subsidiary Mexicana de Cobre at La Caridad mine in the State of Sonora. Production in 1999 increased by 33.8% to 7,961 t of molybdenum in concentrate. The increase represents more than a 100% increase from that of 1995 when production was 3,883 t. The concentrates were shipped to the nearby Molymex S.A. de C.V., a subsidiary of the Chilean company Molibdenos y Metales S.A., to produce molybdenum oxide.

### **Industrial Minerals**

**Cement.**—Cement production increased by 6% to 29.4 Mt. CEMEX, the world's third largest producer, had a production capacity in Mexico of 27.2 Mt through ownership of 15 plants and minority participation in the three plant of Cementos de Chihuahua S.A. de C.V. The company also had 216 ready-mix plants, 72 land-distribution centers, and 5 marine terminals (Cementos Mexicanos S.A. de C.V., December 31, 1999, CEMEX Worldwide, Mexico, accessed January 11, 2001, at URL <http://www.cemex.com/english/world/16011.html>). The CEMEX share of Mexico's cement production capacity was about 65%, and the company controlled about 60% of the domestic market. The second largest cement producer in Mexico was Cementos Apasco S.A. de C.V. with 6 cement plants, 84 ready-mix plants, 22 land distribution centers, and 3 marine terminals (Cementos Apasco S.A. de C.V., Infrastructure, accessed January 11, 2001, at URL <http://www.apasco.com.mx/apasco/apasco/infraest.htm>).

Cooperativa Manufacturera de Cementos Portland La Cruz Azul S.C.L. (Cementos Cruz Azul), the third largest cement producer in Mexico, was building a cement plant in Tepezala, the State of Aguascalientes. The \$180 million, 1-Mt plant was scheduled for completion in 2000. The new plant was part of Cementos Cruz Azul's new division, Cementos y Concretos Nacional S.A. de C.V. (Washington Times, 1999).

**Fluorspar.**—Mexico was the world's second largest producer of fluorspar after China. Mexico's production of fluorspar decreased by 6% to 561,265 t. The State of San Luis Potosí was the leading producer with almost 75% of the country's production. Cia. Minera Las Cuevas S.A. de C.V., which had operations in the States of Coahuila and San Luis Potosí, was the leading producer with a capacity of 520,000 t/yr.

**Strontium (Celestite).**—Mexico was the world largest

producer of celestite with 164,682 t, this was an increase of 39% compared with that of 1999 and a 12% decrease from 1997 to 1998 but a strong increase (19%) since 1995. In 1999, Mexico produced more than 50% of the world's celestite (excludes China and countries of the former Soviet Union for which information is not enough to make reliable estimates). All Mexican celestite is mined in the State of Coahuila, and most of the production is then converted to strontium carbonate in plants in Durango, Monterrey, and Reynosa.

Chemical Products Corp. of the United States imported Mexican celestite to produce strontium carbonate in its plant in Georgia; the company also owned and operated the 22,000-t/yr strontium carbonate plant in Reynosa, State of Tamaulipas.

### **Mineral Fuels**

**Coal.**—Mexican production of coal increased by more than 7% to 13.3 Mt. The principal producer was Minera Carbonifera Río Escondido S.A. de C.V. in the State of Coahuila. Almost the entire coal production in Mexico in 1999 was from the State of Coahuila.

**Oil and Gas.**—Production of crude petroleum and condensate decreased by 4.7% compared with that of 1998. Almost 77% of crude production was from offshore wells, 49% of which was produced from Cantarell and Ku, Mexico's largest oilfields in the Marina Norte region. Heavy crude accounted for more than 50% of the production (Petróleos Mexicanos S.A. de C.V., 2000, p. 44, 157).

During 1999, PEMEX invested \$202 million in exploration activities. On January 1, 2000, Mexico's total hydrocarbons reserves were 58.2 billion barrels of crude equivalent. Of this total, 58.6% was in proven reserves, or less than 25 years of production at present output level (Petróleos Mexicanos S.A. de C.V., 2000, p. 44, 50, 58).

One of PEMEX's strategic plans included the promotion of natural gas. The company's exploration and production group planned to invest \$13 billion in a 15-year program to increase natural gas production. Plans called for a 17% increase by 2003 and an almost 75% increase by 2008. For 2000, PEMEX planned to invest \$418 million in the project. Domestic sales of natural gas increased by 6.2%. Almost 58% of the total was used by the industrial sector. The second largest user was electricity generation with 37% of the total. The remaining 5% was used by residential customers (Petróleos Mexicanos S.A. de C.V., 2000, p. 54, 65).

**Refinery Products.**—Production of refinery products decreased by less than 1% to 483 Mbbl. One of PEMEX's recent investment targets has been the renovation and expansion of its refineries. As part of this effort, a three-phase program began in 1997 with the \$1.6 billion modernization of the Cadereyta refinery, which was scheduled for completion by mid-2000. In 1999 during the second phase of the program, the modernization of three other refineries, Madero, Tula and Salamanca, began. During the third phase of the program, the Minatitlán and Salina Cruz refineries will be renovated (Petróleos Mexicanos S.A. de C.V., 2000, p. 75).

The \$1.2 billion Madero project was awarded in February to Premoso S.A. de C.V., a consortium of SK Engineering & Construction Co. Ltd., Siemens AG, and Grupo Tribasa, The

Madero project, scheduled for completion by 2002 would increase production by 190,000 barrels per day (Korean Herald, September 16, 1999, SKEC stepping up \$1.2 bil. refinery modernization project in Mexico, accessed November 10, 1999 at URL [http://www.Koreaherald.co.kr/cgi-bin/searched\\_word?qstr+sulfur&pa.../19990916\\_1148.htm](http://www.Koreaherald.co.kr/cgi-bin/searched_word?qstr+sulfur&pa.../19990916_1148.htm)).

## Infrastructure

Mexico had 26,700 kilometers (km) of railroads and 330,000 km of roads. As part of the Toll Highway Program that began in 1989, more than 10,000 km of new highways have been constructed. The country had 155,400 km of rural roads and 50,400 km of gravel roads. In addition, private companies were constructing 1,600 km of roadways and several bridges across the U.S. border with Mexico.

Although the Government was financing the expansion of 2,100 km of highways to four lanes, it allowed the private sector to participate in such projects. The concession holder was allowed to charge tolls on projects developed until construction costs had been recovered and a reasonable profit made, at which time ownership of the highway would revert to the Government.

To streamline transportation of freight within Mexico, the Government modified the regulations that governed the trucking industry in 1990. After elimination of route control by private companies, Mexican carriers could move freight anywhere in the country. In addition, under the North American Free Trade Agreement, U.S. and Canadian trucking lines would be able to avoid transshipment delays at the border by transporting freight directly across national boundaries to destinations in the States of Chihuahua, Coahuila, Nuevo León, and Sonora. Mexican carriers had reciprocal rights to operate in Arizona, California, New Mexico, and Texas.

The country had 108 maritime ports and 2,900 km of navigable rivers and coastal canals. Of the 64 ships in the merchant marine, at least 44 were available for the transportation of mineral products. Within Mexico, most ore and metallurgical products were transported by truck.

During the 1980's, railways declined in importance as the volume of freight and passenger transport dropped by more than 25% owing to increasingly poor and unreliable service. In 1998, the load transported by railroad increased by 50%. Railroads were used mainly for bulk items, such as coal, coke, and iron ore. Three of Mexico's large mining companies, Grupo México, Luismín, and Peñoles were involved in railroad operations. This became possible in 1995, when the Congress approved the necessary constitutional amendment to allow the private sector to participate in the operation of Mexico's railroad system with 50-year concessions. The Government, however, continued to operate the railroad across the Isthmus of Tehuantepec.

Hydrocarbon output continued to dominate Mexico's energy sector. Crude oil and natural gas generally represented about 90% of all energy produced. The remaining 10% of primary energy production typically was from wood and sugar cane (4.3%), hydroelectric sources (3%), coal (1.5%), geothermal wells (0.7%), and nuclear energy (0.5%).

Crude oil and natural gas were transported mainly through pipelines within Mexico. Of the country's nine refineries, eight received crude oil by pipeline.

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

(Metric tons unless otherwise specified)

Commodity 3/ METALS	1995	1996	1997	1998	1999
Aluminum, metal:					
Primary	10,413	61,458	66,358	61,848	62,736
Secondary	128,618	84,982	123,179	217,857	362,866
Antimony:					
Mine output, Sb content	266	--	849	338	126
Metal 4/	1,783	983	1,909	1,301	273
Arsenic 5/	3,620	2,942	2,999	2,573	2,419
Bismuth:					
Mine output, Bi content 6/	995	1,070	1,642	1,204	548
Metal, refined	924	957	990	1,030	412
Cadmium:					
Mine output, Cd content	1,385	1,455	1,327	1,739 r/	1,311
Metal, refined	689	784	1,223	1,218 r/	1,352
Copper:					
Mine output, Cu content:					
By concentration or cementation	294,647	295,303	342,319	335,822	330,232
Leaching (electrowon)	38,918	45,407	48,217	48,819	50,952
Total	333,565	340,710	390,536	384,641	381,184
Metal:					
Anode and blister	274,356	280,462	348,290	378,302	352,700
Refined:					
Primary	179,418	225,507	282,217	432,000	359,952
Secondary	32,782	16,493	14,800 e/	15,000	14,000 e/
Total	212,200	242,000	297,017	447,000	373,952
Gold:					
Mine output, Au content kilograms	20,292	24,477	26,001	25,426 r/	23,755
Metal, refined do.	8,355	8,635	26,030	25,298 r/	23,475
Iron and steel:					
Iron ore, mine output:					
Gross weight thousand tons	9,375	10,182	10,467	10,557	11,475
Fe content do.	5,625	6,109	6,280	6,334	6,885
Metal:					
Pig iron do.	4,142	4,230	4,450	4,532	4,822
Direct-reduced iron do.	3,700	3,794	4,440	5,584	6,070
Total do.	7,842	8,024	8,890	10,116	10,892
Ferroalloys: 7/					
Ferromanganese do.	109	126	132	154	148
Silicomanganese do.	77	105	117	115	128
Total do.	186	231	249	269	276
Crude steel do.	12,147	13,172	14,254	14,182 r/	15,299
Rolled products 8/ do.	8,738	10,341	11,309	10,789 r/	11,111
Lead:					
Mine output, Pb content	164,348	173,831	174,661	166,060	125,656
Metal:					
Smelter:					
Primary 9/	166,862	150,971	169,510	163,645	111,136
Secondary (refined) e/	10,000	10,000	10,000	10,000	10,000
Total e/	177,000	161,000	180,000	174,000	121,000
Refined:					
Primary 10/	165,868	150,395	168,164	163,206	108,978
Secondary e/	10,000	10,000	10,000	10,000	10,000
Total e/	176,000	160,000	178,000	173,000	119,000
Manganese ore: 11/					
Gross weight	472,200	485,000	534,000	510,000	459,000
Mn content	174,200	173,380	192,825	187,103	169,107
Mercury, mine output, Hg content e/	15	15	15	15	15
Molybdenum, mine output, Mo content	3,883	4,210	4,841	5,949	7,961
Silver:					
Mine output, Ag content kilograms	2,324,348	2,527,875	2,679,090	2,686,021	2,466,981
Metallurgical products, Ag content:					
In copper bars do.	389,620	375,325	378,557	395,251	357,017
Mixed gold and silver bars do.	169,744	240,677	243,188	237,868	259,715

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity 3/	1995	1996	1997	1998	1999
<b>METALS--Continued</b>					
Silver--Continued:					
Metallurgical products, Ag content--Continued:					
Metal, refined, primary kilograms	1,781,111	1,744,464	1,928,812	2,100,493	1,596,876
Other do.	108,762	175,998	149,828	134,487	100,000 e/
Tin:					
Mine output, Sn content	1	2	5	5	4
Metal, smelter, primary	415	1,234	1,188	1,078 r/	1,258
Tungsten, mine output, W content	287	188	179	130	40
Zinc:					
Mine output, Zn content	363,658	377,599	379,252	395,391	362,811
Metal, refined, primary	222,748	221,736	231,444	230,325	218,913
<b>INDUSTRIAL MINERALS</b>					
Abrasives, natural 12/	8,234	9,922	8,271	9,274 r/	6,208
Barite	248,367	470,028	236,606	161,555	157,953
Cement, hydraulic	24,042	25,366	27,548	27,744	29,413
Clays:					
Bentonite	72,599	69,810	111,503	185,729	208,611
Common	3,697,053	4,048,458	5,078,048	5,601,071	6,964,647
Fuller's earth	15,755	41,800	51,430	48,016	47,522
Kaolin	221,685	253,602	235,278	339,013	489,993
Diatomite	50,200	52,494	59,463	66,812	72,181
Feldspar	121,779	139,972	155,760	197,866	262,241
Fluorspar:					
Acid-grade thousand tons	270	279	291	331	325
Metallurgical-grade do.	252	245	262	267	237
Total do.	522	524	553	598	562
Graphite, natural:					
Amorphous	32,938	38,967	46,707	42,893	31,770
Crystalline	1,450	1,445	1,275	568	--
Total	34,388	40,412	47,982	43,461	31,770
Gypsum and anhydrite, crude (yeso)	4,854,339	6,064,682	5,869,175	7,045,197	6,953,756
Lime, hydrated and quicklime e/ thousand tons	6,580	6,600	6,500	6,500	6,500
Magnesium compounds:					
Magnesite	250	200	231	274	308
Magnesia 13/	80,517	83,526 r/	73,657 r/	77,153 r/	74,213
Mica, all grades	5,028	4,273	975	890	971
Nitrogen, N content of ammonia	1,992,000	2,053,900	1,448,300	1,449,300	1,002,700
Perlite	33,529	37,417	51,758	54,840	61,596
Phosphate rock 14/	622,354	682,079	713,662	756,349	950,649
Salt, all types thousand tons	7,670	8,508	7,933	8,412	8,236
Sodium compounds, n.e.s.: e/					
Carbonate (soda ash), synthetic	290,000	290,000	290,000	290,000	290,000
Sulfate, natural (bloedite) 15/	588,000	603,000	616,000	591,000	595,000
Stone, sand and gravel:					
Calcite, common	362,715	325,199	490,531	592,412	682,249
Dolomite	931,770	929,933	902,710	785,516	415,284
Limestone thousand tons	32,873	37,641	43,706	44,372	45,449
Marble	898,990	659,192	516,805	663,945	744,377
Quartz, quartzite, glass sand (silica)	1,292,265	1,424,825	1,564,348	1,733,439	1,700,527
Sand thousand cubic meters	45,086	55,344	60,104	54,703	58,912
Gravel do.	37,970	40,179	43,636	43,947	45,050
Strontium minerals, celestite	138,342	141,142	134,707	118,230	164,682
Sulfur, elemental:					
Byproduct:					
Of metallurgy e/ thousand tons	359	359	417	474	450
Of petroleum and natural gas do.	882	921	923	913	860
Total e/ do.	1,240	1,280	1,340	1,390	1,310
Talc	11,134	10,100	13,586	18,843	18,981
Vermiculite	225	350	295	-- r/	100 e/
Wollastonite	20,194	28,365	20,655	41,264	44,126

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity 3/		1995	1996	1997	1998	1999
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
<b>Coal:</b>						
<b>Run-of-mine:</b>						
Metallurgical	thousand tons	4,617	5,131	4,479	4,823	4,747
Steam	do.	7,183	8,616	8,228	7,566	8,555
Total	do.	11,800	13,747	12,707	12,389	13,302
Washed metallurgical coal	do.	1,800 e/	1,712	1,906	1,826 r/	1,944
<b>Coke: 16/</b>						
Metallurgical	do.	2,097	2,141	2,100	2,166	2,179
Breeze	do.	51	43	37	37	31
Total	do.	2,148	2,184	2,137	2,203	2,210
<b>Gas, natural:</b>						
Gross	million cubic meters	38,842	43,348	46,158	49,506	49,506
Marketed	do.	30,038	32,022	34,296	37,292	37,746
<b>Petroleum:</b>						
Crude	thousand 42-gallon barrels	955,205	1,043,170	1,103,030	1,120,550	1,060,690
Condensate (natural gas liquids)	do.	162,425	152,935	141,620	156,585	159,505
Total	do.	1,117,630	1,196,105	1,244,650	1,277,135	1,220,195
<b>Refinery products:</b>						
Liquefied petroleum gas	do.	22,411	22,740	13,980	10,512	11,315
Motor gasoline	do.	154,213	152,023	141,730	150,344	161,330
Jet fuel	do.	25,587	22,520	20,440	20,842	21,170
Kerosene	do.	2,409	2,555	1,132	694	365
Distillate fuel oil (diesel)	do.	93,002	98,404	100,521	105,850	102,200
Lubricants	do.	2,446	2,446	2,044	1,971	2,920
Residual fuel oil	do.	152,059	152,570	155,563	162,717	153,665
Asphalt	do.	10,841	8,505	9,417	10,841	10,950
Other, refinery fuel, and losses	do.	24,234	21,388	20,877	21,241	18,615
Total	do.	487,202	483,151	465,704	485,012	482,530

e/ Estimated. r/ Revised. -- Zero.

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

2/ Table includes data available through December 14, 2000.

3/ In addition to the commodities listed, additional types of crude construction materials are produced, but output is not reported; available information is inadequate to make estimates of output levels.

4/ Sb content of antimonial lead and impure bars plus refined metals.

5/ Arsenic content of white and black (impure) arsenic trioxide.

6/ Refined metal plus bismuth content of impure smelter products.

7/ Reported by Cámara Nacional del Hierro y del Acero. Cía. Minera Autlán reported salable production of ferromanganese, in metric tons: 1995--58,000; 1996--69,000; 1997--68,000; 1998--87,000 (revised); and 1999--79,000. For silicomanganese, Autlán reported, in metric tons, the following: 1995--67,700; 1996--93,000; 1997-98--105,000; and 1999--114,000.

8/ Includes flat, nonflat, and seamless pipe steel products.

9/ Lead content of impure bar, antimonial lead, plus refined metal.

10/ Includes lead content of antimonial lead.

11/ Mostly oxide nodules; includes smaller quantities of direct-shipping carbonates and oxide ores for metallurgical and battery applications.

12/ Based on exports that comprise mostly pumice stone and emery (a granular, impure variety of corundum).

13/ Reported by Industrias Peñoles S.A. de C.V. as the only major producer.

14/ Includes only output used to manufacture fertilizers.

15/ Series reflects output reported by Industrias Peñoles plus an additional 40,000 tons estimated output by other producers.

16/ Includes coke made from imported metallurgical coal.

TABLE 2  
MEXICO: STRUCTURE OF THE MINERAL INDUSTRY IN 1999

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities 1/	Annual capacity
Aluminum	Aluminio S.A. (Nacobre, 77.8%; Carso Group, 20%)	Smelter at Veracruz, Ver.	94.
Antimony	Cía. Minera y Refinadora Mexicana S.A. (private Mexican, 51%; Cookson Ltd., 49%)	San José mine, Catorce, S.L.P.	365.
Barite	Barita de Sonora S.A. (Grupo Acerero del Norte S.A. de C.V. (GAN), 100%)	Mazatán, Son.	219.
Bismuth	Met-Mex Peñoles S.A. de C.V. (Industrias Peñoles S.A. de C.V. (Peñoles), 100%)		1.2.
Do.	Cía. Minera Capela S.A. de C.V. (Peñoles, 100%)	La Minita mine, Chinicuilca, Mich.	NA.
Do.	Minerales y Arcillas S.A. de C.V. (private Mexican, 100%)	San Francisco del Huerto mine in San Pedro, Coah., La Escondida and Angelita mines and plant in Galeana	55.
Do.	Barita de Santa Rosa S.A. de C.V. (private Mexican, 100%)	Muzquiz, Coah.	256.
Cement	Cementos Mexicanos S.A. de C.V. (CEMEX), private Mexican, 100%	Ensenada, B. C.N.; Torreón, Coah.; Barrientos, D.F.; Artonilco and Huichapán, Hgo.; Guadalajara and Zapotilic, Jal.; Hidalgo and Monterrey, N.L.; Tepeaca, Pue.; Tamuín and Valles, S.L.P.; Hermosillo and Yaquí, Son.; and Mérida, Yuc.	26,650.
Do.	Cementos Apasco S.A. de C.V. (Holderbank Financière Glaris, Ltd, 49%)	Apasco, Mex.; Ramos Arizpe, Coah.; Macuspana, Tab.; Tecomán, Col.; Orizaba, Ver.; Acapulco, Gro.	8,900.
Do.	Cooperativa Manufacturera de Cementos Portland La Cruz Azul S.C.L. (private Mexican, 100%)	Cruz Azul, Hgo., Lagunas, Oax.	5,000.
Do.	Cementos de Chihuahua S.A. de C.V. (CEMEX, 36%; private Mexican, 64%)	Chihuahua, Ciudad Juárez, and Samalayuca, Chih.	2,000.
Coal	Minerales de Monclova S.A. (Altos Hornos de Mexico, S.A. de C.V. (AHMSA), 100%)	Mimosa, Palau mines, Muzquiz washing plant at Palau, Coah., and Coking plant at Monclova, Coah.	3,000.
Do.	Carbonífera de San Patricio S.A. de C.V. (private Mexican, 100%)	Progreso, Coah.	1,314.
Do.	Industrial Minera México S.A. de C.V. (IMMSA) (Grupo Minero México S.A. de C.V., 100%)	Nueva Rosita, Coah.	1,500.
Do.	Minera Carbonífera Río Escondido S.A. de C.V. (MICARE) (GAN, 51%; Mission Energy, 49%)	Mina I, Mina II, and Tajo I at Nava and Piedras Negras, Coah.	4,000.
Copper	Mexicana de Cobre S.A. de C.V. (Grupo Minero México S.A. de C.V., 96.4%)	La Caridad mine, smelter, refinery and rod plant at Nacozari de García, Son.	330 smelter, 22 SX-EW. 330 refinery, 150 rod plant.
Do.	Mexicana de Cananea S.A. de C.V. (Grupo Minero México S.A. de C.V., 98.5%)	Mine and smelter at Cananea, Son.	29,200 mill, 33 SX-EW.
Ferroalloys	Cía. Minera Autlán S.A. de C.V. (Grupo Ferrominero, 54%; Minas de Basis S.A. de C.V., 32%, Broken Hill Property Co. Ltd., 14%)	Plant in Tamós, Ver. Plant in Teziutlan, Pue. Plant in Gómez Palacio, Dgo.	140. 38. 35.
Fluorspar	Cía. Minera Las Cuevas S.A. de C.V. (Grupo Industrial Camesa S.A. de C.V.) 2/	Salitera (Zaragoza), S.L.P.	520.
Do.	Fluorita de México S.A. de C.V. (Corp. Alfil, 51%; Applied Industrial Minerals Corp., 49%)	Mines at La Encantada district and plant at Muzquiz, Coah.	150.
Gold	kilograms Cía. Fresnillo S.A. de C.V. (Industrias Peñoles S.A. de C.V. (Peñoles), 100%)	Fresnillo mine, Zac.	1,866.
Do.	do. Minas de San Luis S.A. (Industriales Luismin, 100%)	Tayoltita and Santa Rita, Dgo.; San Antonio, Sin.; San Martín, Qro.; La Guitarra, Mex.	2,700.
Do.	do. Cía. Minera de Santa Gertrudis (Grupo Ariztegui, 51%; Phelps Dodge, 49%)	Santa Gertrudis mine, Son.	1,600.
Do.	do. Exploraciones El Dorado S.A. de C.V. (70%), Minerales Sotula (30%)	La Colorada mine, Son.	800.
Do.	do. Minera Hecla (Hecla Mining Co. of U.S., 100%)	La Choya mine, Son.	2,000.
Do.	do. Walhalla Mining Co. NL (private foreign, 100%)	Amelia mine, Son.	1,300.

See footnotes at end of table.

TABLE 2--Continued  
MEXICO: STRUCTURE OF THE MINERAL INDUSTRY IN 1999

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities 1/	Annual capacity
Gold--Continued:	kilograms	Cía. Minera las Torres S.A. de C.V. (Peñoles, 100%)	Guanajuato, Gto.	730.
Do.	do.	Cía. Minera El Cubo S.A. de C.V. (private Mexican, 100%)	do.	128.
Do.	do.	Sociedad Cooperativa Minero Metalúrgica Santa Fe de Guanajuato (private Mexican, 100%)	do.	438.
Graphite		Grafitos Mexicanos S.A. (Cummings Moore Graphite Co. of U.S., 25%; private Mexican, 75%)	Lourdes and San Francisco mines, Son.	60.
Do.		Grafito Superior S.A. de C.V. (Superior Graphite Co., 100%)	Covalmar, Santa Clara, and Río Mayo mines, and plant in Son.	25.
Gypsum		Cía. Occidental Mexicana S.A. (private Mexican, 51%, Domtar, Ltd. of Canada, 49%)	Santa Rosalía on San Marcos Island, B.C.S.	2,500.
Iron ore		Consorcio Minero Benito Juárez Peña Colorada S.A. de C.V. (Ispat International N.V., 49%; Hylsamex S.A. de C.V., 51%)	Peña Colorada mine and pellet plant near Manzanillo, Col.	3,500.
Do.		AHMSA (Grupo Acerero del Norte S.A. de C.V. (GAN), 74%)	La Perla mine, Chih.; Hércules mine, Coah.; and Cerro de Mercado mine, Dgo.	5,000.
Do.		Siderúrgica Lázaro Cárdenas-Las Truchas, S.A. (SICARTSA) (Grupo Villacero, 100%)	Ferrotepec, Volcán, and Mango deposits in Las Truchas project area and pellet plant, Mich.	2,350.
Do.		Hylsamex S.A. de C.V. (Grupo Industrial ALFA, 100%)	San Ramón and Aquila mines	1,500.
Lead and zinc		Industrial Minera México S.A. de C.V. (IMMSA) (Grupo Minero México S.A. de C.V., 100%)	Charcas, S.L.P.; San Martín, Zac.; Santa Eulalia, Chih.; Taxco, Gro.; Rosario, Sin.; Santa Bárbara, Chih.; Velardeña, Dgo; lead refinery at Monterrey, N.L.; zinc refinery at S.L.P.	70 (lead), 110 refined zinc.
Do.		Industrias Peñoles S.A. de C.V. (private Mexican, 97%; private U.S., 3%)	Mines at La Encantada, Coah.; Fresnillo, Zac.; Naica, Chih.; Bismark, Son; Rey de Plata, Gro. (Peñoles, 60%; Outokumpu Oy. 40%); metallurgical complex at Torreón, Coah., with silver, lead, and zinc smelter and/or refineries operated by Met-MexPeñoles (Peñoles, 100%)	180 refined lead, 130 refined zinc.
Do.		Minera San Francisco del Oro S.A. de C.V. (Empresas Frisco, S.A. de C.V., 100%)	San Francisco del Oro, near Hidalgo del Parral, Chih.	15 (lead), 21 (zinc).
Do.		Minera Real de Angeles S.A. de C.V. (Empresas Frisco, S.A. de C.V., 100%)	Noria de Angeles, Zac.	45 (lead), 47 (zinc).
Manganese		Cía. Minera Autlán S.A. de C.V. (Grupo Ferrominero S.A. de C.V. 81.75%; private Mexican, 18.25%)	Molango, Naopa, and Nonoalco mines, Hgo.	600 ore and concentrate.
Molybdenum		Mexicana de Cobre S.A. (Grupo Minero México S.A. de C.V., 100%)	La Caridad mine, Molybdenum plant, Son.	6.
Petroleum thousand 42-gallon barrels per day		Petróleos Mexicanos S.A. de C.V. (PEMEX) (Government, 100%)	Comcalcalco, Poza Rica, Ver., and Gulf of Campeche, Cam. districts	3,500. 3/
Salt		Exportadora de Sal S.A. (ESSA) (Fideicomiso de Fomento Minero, 51%; Mitsubishi Corp., 49%)	Solar salt complex at Guerrero Negro, B.C.S.	6,000.
Silver	kilograms	Peñoles (private Mexican, 97%, private U.S., 3%) 4/	Mines: Naica, Chih.; Fresnillo, Zac.; Las Torres, Gto.; Cuale, Jal.; La Negra, Qro.; La Encantada, Coah.; La Minita, Mich. Met-Mex refinery in Torreón, Coah.	1,600 mine, 2,200 refinery.
Do.	do.	IMMSA (Grupo Minero México S.A. de C.V., 100%)	San Martín mine, Sombrerete, Zac.; Taxco, Gro.; Charcas, S.L.P.; Santa Eulalia, Chih.; Refinery at Monterrey, N.L.	467.
Do.	do.	Minera Real de Angeles S.A. de C.V. (Empresas Frisco S.A. de C.V., 100%)	Open pit mine and concentrator at Noria de Angeles, Zac.	924.
Sodium sulfate		Química del Rey, S.A. de C.V. (Peñoles, 100%)	Plant at Laguna del Rey, Coah.	620.

See footnotes at end of table.

TABLE 2--Continued  
MEXICO: STRUCTURE OF THE MINERAL INDUSTRY IN 1999

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities 1/	Annual capacity
Steel	AHMSA (GAN, 74%)	Steelworks at Monclova, Coah.	3,700, 3,550 pellet.
Do.	Hylsamex S.A. de C.V. (Grupo Industrial ALFA, 100%)	Steel works and direct-reduction units at Monterrey, NL., and Puebla, Pue. Pelletizing plant in Col.	3,100, 1,500 pellet.
Do.	DEACERO S.A. de C.V. (private Mexican, 100%)	Steelworks at Saltillo, Coah. and Celaya, Gto.	1,450.
Do.	Ispat Mexicana S.A. de C.V. (ISspat International, 100%)	SICARTSA II Plant Facilities at Lázaro Cárdenas, Mich.	5,300, 4,000 pellet.
Do.	Siderúrgica Lázaro Cárdenas-Las Truchas S.A. de C.V., Grupo Villacero, 100%)	Port Lázaro Cárdenas, Mich.	2,350, 1,850 pellet.
Do.	Tubos de Acero de México S.A. (private (Mexican, 100%)	Veracruz, Ver.	1,000.
Strontium (celestite)	Cía. Minera La Valenciana (private Mexican, 100%)	San Agustín mine in Torreón, Coah.	50.
Sulfur	Petróleos Mexicanos S.A. de C.V.	Nationwide petroleum operations	890.
Tin 5/	Fundidora Marni S.A.	San Luis Potosí, S.L.P.	NA.
Do.	PIZUTO S.A.	do.	NA.

NA Not available.

1/ State abbreviations: Baja California Norte (B.C.N.), Baja California Sur (B.C.S.), Campeche (Cam.), Chiapas (Chia.), Chihuahua (Chih.), Coahuila (Coah.), Colima (Col.), Distrito Federal (D.F.), Durango (Dgo.), Guanajuato (Gto.), Guerrero (Gro.), Hidalgo (Hgo.), Jalisco (Jal.), Mexico (Mex.), Michoacan Mich.), Nuevo Leon (N.L.) Oaxaca (Oax.), Puebla (Pue.), Queretaro ( Qro.), San Luis Potosí (S.L.P.), Sinaloa (Sin.), Sonora (Son.), Tabasco (Tab.), Veracruz (Ver.), Yucatan (Yuc.), and Zacatecas (Zac.).

2/ Grupo Industrial Camesa S.A. de C.V. was owned by Banco Internacional (34%), Banco del Atlántico (34%), Banamex (17%), Noranda Inc. of Canada (4%), Free Float (12%).

3/ PEMEX operated six refineries with an installed capacity of 1.68 million barrels per day.

4 Includes capacity from Cía. Fresnillo S.A. de C.V.

5/ Smelter output from mostly imported concentrates.

TABLE 3  
MEXICO: EXPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Destinations	
		United States	Other (principal)
<b>METALS</b>			
Alkaline-earth metals	4	1	Argentina 3.
Aluminum:			
Ore and concentrate	2,407	--	Guatemala 124; Peru 120; unspecified 2,162.
Oxides and hydroxides	2,642	1,871	Panama 239; Belgium-Luxembourg 81; Guatemala 33.
Ash and residue	249	249	
Metal including alloys:			
Scrap	77,159	75,402	United Kingdom 44; Canada 4; unspecified Asia 1,711.
Unwrought	6,951	643	Chile 5,665; Ecuador 448; unspecified 180.
Semimanufactures	20,467	17,087	Guatemala 950; Colombia 482; Argentina 350.
Antimony:			
Oxides	2,902	2,881	Venezuela 13; Chile 4; Colombia 4.
Metal including alloys, all forms	331	331	
Bismuth, metal including alloys, all forms	2,526	802	Belgium-Luxembourg 924; Hong Kong, China 670; United Kingdom 61.
Cadmium, metal including alloys, all forms	1,215	64	Netherlands 585; Hong Kong, China 56; Brazil 50.
Chromium:			
Ore and concentrate	498	--	All to Canada.
Oxides and hydroxides	value, thousands \$27	--	Venezuela \$13; Peru \$9; Costa Rica \$2.
Metal including alloys, all forms	do. \$3	--	All to Honduras.
Cobalt, metal including alloys, all forms	20	20	
Copper:			
Ore and concentrate	68,722	8,899	Japan 32,864; Peru 13,945; China 5,226.
Matte and speiss including cement copper	15,664	7,434	Peru 7,989; France 241.

See footnotes at end of table.

TABLE 3--Continued  
MEXICO: EXPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Destinations	
		United States	Other (principal)
METALS--Continued			
Copper--Continued:			
Oxides and hydroxides	2,314	1,970	Argentina 86; Cameroon 50; Greece 43.
Sulfate	11,365	10,898	Dominican Republic 161; France 90; Guatemala 62.
Metal including alloys:			
Scrap	58,423	52,052	Hong Kong, China 1,840; China 1,437; unspecified 1,409.
Unwrought	237,707	220,116	Hong Kong, China 6,073; Japan 1,610; unspecified Asia 9,379.
Semimanufactures	value, thousands \$183,731	\$155,778	Colombia \$3,385; Brazil \$3,196; Venezuela \$2,847.
Gold:			
Waste and sweepings	do. \$31,745	\$31,744	Bolivia \$1.
Metal including alloys, unwrought and partly wrought	do. \$110,742	\$85,584	United Kingdom \$13,806; Germany \$11,266; Italy \$57.
Iron and steel:			
Ore and concentrate, excluding roasted pyrite	185,984	9,984	Germany 65,000; Trinidad and Tobago 56,000; Canada 55,000.
Metal:			
Scrap	155,618	149,545	Hong Kong, China 2,512; Japan 1,740; Spain 885.
Pig iron, cast iron, related materials	36,261	14,887	Indonesia 22,000; Chile 187; unspecified 1,512.
Ferroalloys:			
Ferrochromium	271	52	Netherlands 166; Sweden 45; unspecified 8.
Ferromanganese	34,329	26,510	Chile 3,973; Netherlands 1,796; El Salvador 646.
Ferrosilicomanganese	47,802	46,676	Guatemala 275; Colombia 260; unspecified 301.
Ferrosilicon	161	97	Argentina 24; El Salvador 20; Brazil 17.
Ferrovandium	47	42	Peru 1; unspecified 3.
Silicon metal	107	--	Venezuela 82; China 19; unspecified 5.
Unspecified	7	7	
Steel, primary forms	thousand tons 2,489	1,730	Republic of Korea 223; Canada 179; Germany 122.
Semimanufactures:			
Flat-rolled products:			
Of iron or nonalloy steel:			
Not clad, plated, coated	486,027	346,354	Venezuela 37,554; Chile 31,952; Guatemala 11,340.
Clad, plated, coated	532,437	372,786	Chile 35,156; Brazil 11,955; Dominican Republic 10,209.
Of alloy steel	value, thousands \$177,139	\$153,813	Brazil \$10,755; Hong Kong, China \$4,034; Argentina \$2,863.
Bars, rods, angles, shapes, sections	do. \$146,041	\$104,980	Chile \$8,944; Peru \$6,367; Guatemala \$5,727.
Rails and accessories	725	371	Germany 312; Guatemala 23; Ecuador 9.
Wire	67,829	51,110	El Salvador 3,807; Chile 3,404; Guatemala 3,183.
Tubes, pipes, fittings	910,581	490,117	Venezuela 125,436; Colombia 41,905; Chile 28,457.
Lead:			
Ore and concentrate	12,238	--	Canada 8,144; Republic of Korea 4,092.
Oxides	34,301	16,493	Japan 9,786; Brazil 5,418; Colombia 747.
Metal including alloys:			
Scrap	1,292	1,292	
Unwrought	71,834	62,165	Brazil 5,696; Venezuela 1,116; Japan 842.
Semimanufactures	value, thousands \$723	\$689	Guatemala \$30; El Salvador \$4.
Lithium oxides and hydroxides	1	--	All to Argentina.
Magnesium, metal including alloys:			
Scrap	3	3	
Unwrought	value, thousands \$10	\$2	Venezuela \$8.
Semimanufactures	1,700	1,695	Ecuador 5.
Manganese:			
Ore and concentrate	48,713	38,057	Singapore 3,856; Indonesia 1,465; Colombia 1,157.
Oxides	2,202	1,542	Indonesia 272; Venezuela 187; United Kingdom 61.
Metal including alloys, all forms	690	97	Spain 171; Netherlands 150; Guatemala 120.
Mercury	value, thousands \$2	--	All to Nicaragua.
Molybdenum:			
Ore and concentrate:			
Roasted	10,219	6,874	Japan 2,346; Netherlands 530; Canada 227.
Unroasted	483	--	Netherlands 291; Chile 115; Austria 77.
Oxides and hydroxides	1,132	1,132	
Metal including alloys, semimanufactures	value, thousands \$169	\$14	Unspecified Asia \$155.
Nickel:			
Oxides and hydroxides	91	91	

See footnotes at end of table.

TABLE 3--Continued  
MEXICO: EXPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Destinations	
		United States	Other (principal)
METALS--Continued			
Nickel--Continued:			
Metal including alloys:			
Scrap	216	216	
Unwrought	5	--	El Salvador 1; Guatemala 1; United Kingdom 1.
Semimanufactures	value, thousands \$531	\$371	Guatemala \$104; El Salvador \$29; unspecified \$10.
Platinum-group metals:			
Waste and sweepings	do. \$2,427	\$2,427	
Metal including alloys, unwrought and partly wrought:			
Palladium	do. \$85	\$85	
Platinum	do. \$768	\$417	Canada \$294; Germany \$56.
Rare-earth, metals including alloys, all forms	54	33	Peru 21.
Selenium, elemental	4	--	All to Japan.
Silicon, high-purity	319	319	
Silver:			
Ore and concentrate	value, thousands \$5,513	--	Belgium-Luxembourg \$4,394; Canada \$1,119.
Metal including alloys, unwrought and partly wrought	do. \$425,559	\$239,412	United Kingdom \$132,157; Japan \$47,534; Hong Kong, China \$4,179.
Tantalum, metal including alloys, all forms	23	23	
Tin:			
Tin, metal including alloys:			
Scrap	392	392	
Unwrought	73	70	Unspecified 3.
Semimanufactures	value, thousands \$395	\$345	Venezuela \$29; El Salvador \$2; unspecified \$19.
Titanium:			
Oxides	105	(2/)	Brazil 44; Colombia 23; Argentina 9.
Metal including alloys, all forms	225	209	Italy 12; El Salvador 3.
Tungsten:			
Ore and concentrate	198	198	
Metal including alloys:			
Unwrought	1	1	
Semimanufactures	value, thousands \$98	\$79	Brazil \$8; Guatemala \$5; Honduras \$4.
Uranium and thorium, thorium ore and concentrate	do. \$5	--	All to El Salvador.
Vanadium:			
Oxides and hydroxides	3	--	All to Nicaragua.
Ash and residue	4,298	4,298	
Zinc:			
Ore and concentrate	336,269	39,097	Belgium-Luxembourg 120,632; Russia 65,490; Japan 55,510.
Oxides	28,929	24,483	Spain 1,890; Canada 1,053; Chile 490.
Blue powder	475	117	Belgium-Luxembourg 125; Brazil 100; Chile 64.
Ash and residue	1,617	1,617	
Metal including alloys:			
Scrap	2,131	2,131	
Unwrought	69,672	50,784	Venezuela 7,037; Guatemala 4,697; Colombia 1,886.
Semimanufactures	31,582	30,850	Brazil 404; Belgium-Luxembourg 40; unspecified 193.
Zirconium:			
Ore and concentrate	1,328	--	Chile 1,298; El Salvador 2; unspecified 28.
Metal including alloys:			
Scrap	2	2	
Semimanufactures	value, thousands \$4	--	Unspecified.
Other:			
Ores and concentrates	25	25	
Ashes and residues	8,540	8,540	
INDUSTRIAL MINERALS			
Abrasives, n.e.s.:			
Natural, corundum, emery, pumice, etc.	9,282	9,034	Unspecified 248.
Artificial:			
Corundum	1,109	--	Belgium-Luxembourg 868; unspecified 241.
Silicon carbide	1,660	357	Italy 695; Colombia 244; United Kingdom 141.
Dust and powder of precious and semiprecious stones including diamonds	13	8	Brazil \$2; Hong Kong, China \$2; Panama \$1.
Grinding and polishing wheels and stones	3,670	2,911	Guatemala 37; El Salvador 22; unspecified 629.

See footnotes at end of table.



TABLE 3--Continued  
MEXICO: EXPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Destinations	
		United States	Other (principal)
<b>INDUSTRIAL MINERALS--Continued</b>			
Barite and witherite	18,145	18,063	Venezuela 81.
Boron:			
Crude natural borates	7	6	Unspecified 1.
Oxides and acids	value, thousands \$14	--	Colombia \$7; Guatemala \$2; Venezuela \$2.
Cement	thousand tons 3369.4	1367	Dominican Republic 397; Guatemala 366; Chile 248.
Chalk	245	202	Venezuela 22; Guatemala 20.
Clays, crude:			
Bentonite	38,665	336	Germany 36,033; Colombia 597; Guatemala 522.
Chamotte earth and dinas earth	value, thousands \$5	\$5	
Fire clay	1,288	19	Guatemala 137; Costa Rica 55; unspecified 1,035.
Fuller's earth	75	55	Unspecified 20.
Kaolin	394	32	El Salvador 39; Costa Rica 20; unspecified 265.
Other	619	303	Guatemala 76; Costa Rica 72; unspecified 60.
Diamond, natural:			
Gem, not set or strung	value, thousands \$8,123	\$8,123	
Industrial stones	do. \$52	\$52	
Dust and powder	do. \$12	\$7	Brazil \$2; Hong Kong, China \$2; Panama \$1.
Diatomite and other infusorial earth	10,344	103	Argentina 2,443; Germany 2,296; Brazil 1,591.
Feldspar	8,809	8,784	Venezuela 25.
Fertilizer materials:			
Crude, n.e.s.	827	351	Japan 349; Chile 45; Venezuela 39.
Manufactured:			
Ammonia	201,398	197,715	Guatemala 3,316; El Salvador 363; Costa Rica 4.
Nitrogenous	461,225	199,407	Chile 79,368; Colombia 30,435; France 25,539.
Phosphatic	226,555	--	Chile 134,982; Australia 50,679; New Zealand 13,710.
Potassic	value, thousands 325	--	Costa Rica \$227; Guatemala \$49; Honduras \$20.
Unspecified and mixed	513,929	13,313	India 167,507; Australia 66,816; New Zealand 51,822.
Fluorspar	335,236	48,198	Canada 113,193; Japan 67,377; Netherlands 54,618.
Graphite, natural	16,974	16,848	Guatemala 114; Canada 12.
Gypsum and plaster	thousand tons 3,463	1,930	Japan 833,450; Canada 367,000; Ecuador 129,528.
Iodine	583	551	Malaysia 21; Guatemala 10.
Lime	25,087	19,212	Trinidad and Tobago 4,220; Guatemala 969; unspecified 445.
Magnesium compounds:			
Magnesite, crude	64	52	El Salvador 9; unspecified 3.
Oxides and hydroxides	30,872	6,158	Belgium-Luxembourg 15,155; Japan 3,302; Chile 1,975.
Mica:			
Crude including splittings and waste	value, thousands 1	--	Unspecified.
Worked including agglomerated splittings	21	19	Guatemala 2.
Nitrates, crude	31	9	El Salvador 20; Ecuador 1.
Phosphates, crude	304	--	Chile 182; Peru 72; Guatemala 29.
Phosphorus, elemental	value, thousands \$1	--	All to Belize.
Pigments, mineral, iron oxides and hydroxides, processed	7,047	5,048	Republic of Korea 990; Canada 198; El Salvador 144.
Precious and semiprecious stones other than diamond:			
Natural	value, thousands \$501	\$484	Germany \$7; Brazil \$6; France \$2.
Synthetic	do. \$10	\$9	Australia \$1.
Salt and brine	thousand tons 6,442	6,142	Japan 241; Canada 45; Guatemala 4.
Sodium compounds, n.e.s.:			
Soda ash, manufactured	300	30	Colombia 2; unspecified 267.
Sulfate, manufactured	173,797	87	Brazil 86,112; Venezuela 26,901; Colombia 20,377.
Stone, sand and gravel:			
Dimension stone:			
Crude and partly worked	31,175	22,841	Italy 6,133; Guatemala 203; unspecified Asia 1,410.
Worked	74,301	68,298	Canada 3,040; Guatemala 329; Honduras 199.
Dolomite, chiefly refractory-grade	5,071	937	Trinidad and Tobago 4,093; El Salvador 41.
Gravel and crushed rock	thousand tons 6,786	6,681	Afghanistan 59,824; Chile 44,620; Colombia 1,122.
Limestone other than dimension	1,500	1,500	
Quartz and quartzite	49	47	Netherlands 1.
Sand other than metal-bearing	52,632	51,850	Guatemala 229; Honduras 228; El Salvador 172.

See footnotes at end of table.

TABLE 3--Continued  
MEXICO: EXPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Destinations		
		United States	Other (principal)	
<b>INDUSTRIAL MINERALS--Continued</b>				
<b>Sulfur:</b>				
Elemental:				
Crude including native and byproduct	586,645	586,569	Guatemala 20; Panama 16; unspecified 34.	
Colloidal, precipitated, sublimed	355	--	Guatemala 101; Peru 80; unspecified 106.	
Dioxide	6,895	6,895		
Sulfuric acid	365,289	82,142	Chile 85,639; Guatemala 2,786; unspecified 193,471.	
Talc, steatite, soapstone, pyrophyllite	955	75	Guatemala 33; unspecified 847.	
Vermiculite, perlite, chlorite	1,200	314	Venezuela 524; Brazil 194; Chile 101.	
<b>Other:</b>				
Crude	53,617	38,988	Belgium-Luxembourg 13,395; Chile 293; Japan 249.	
Slag and dross, not metal-bearing:				
Granulated slag (slag sand) from iron and steel industry	81,253	81,119	Venezuela 134.	
Waste, scale, dross, slag of iron or steel industry	11,676	11,635	Guatemala 41.	
Slag and ash n.e.s., including seaweed ash (kelp)	1,861	1,861		
<b>MINERAL FUELS AND RELATED MATERIALS</b>				
Asphalt and bitumen, natural	18,701	14,081	Guatemala 4,609; unspecified 11.	
Carbon black	36,204	17,585	Germany 6,995; Spain 3,026; unspecified 3,124.	
<b>Coal:</b>				
Bituminous	1,813	1,813		
Briquets of anthracite and bituminous coal	135	135		
Lignite including briquets	61	--	All to Argentina.	
All grades including briquets	2,009	1,948	Argentina 61.	
Coke and semicoke	687	--	Guatemala 667; El Salvador 20.	
Gas, natural, gaseous	219,857	219,857		
<b>Petroleum:</b>				
Crude	thousand 42-gallon barrels	596,882	471,641	Spain 43,467; Netherlands Antilles 24,871; Japan 11,530.
Refinery products:				
Liquefied petroleum gas	do.	1,981	476	Guatemala 1,379; Belize 98,275; Aruba 27,910.
Mineral jelly and wax	42-gallon barrels	21,233	13,348	Venezuela 2,998; Colombia 1,141; Guatemala 1,102.
Asphalt	thousand 42-gallon barrels	3,520	3,428	Costa Rica 66; Haiti 12; Guatemala 9.
Bitumen and other residues	do.	3,551	3,458	Do.
Bituminous mixtures	42-gallon barrels	8,313	4,695	Guatemala 2,517; Costa Rica 675; unspecified 201.
Petroleum coke	do.	4,121	99	Chile 2,661; France 810; El Salvador 220.
Unspecified	thousand 42-gallon barrels	36,390	19,045	Brazil 7,212; Nigeria 2,886; unspecified 1,029.

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

2/ Less than 1/2 unit.

Source: United Nations Statistical Office (microfiche).

TABLE 4  
MEXICO: 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	\$85	\$43 Italy \$23; United Kingdom \$13; Germany \$6.
Alkaline-earth metals		911	778 China 42; Canada 39; unspecified Asia 40.
Aluminum:			
Ore and concentrate		42,315	11,446 China 28,941; South Africa 813; Brazil 632.
Oxides and hydroxides		227,589	224,556 Germany 1,791; Spain 363; Japan 216.
Metal including alloys:			
Scrap		47,649	44,199 Guatemala 946; Colombia 748; Venezuela 549.
Unwrought		175,495	96,963 Venezuela 59,586; South Africa 9,125; Canada 4,011.
Semimanufactures		203,110	170,161 Germany 6,383; China 5,502; Costa Rica 4,991.
Antimony:			
Oxides		1,440	1,263 China 121; Germany 30; Belgium-Luxembourg 23.
Metal including alloys, all forms		761	462 China 177; Netherlands 42; Belgium-Luxembourg 35.
Arsenic, metal including alloys, all forms		56	-- All from China.
Beryllium, metal including alloys, all forms	value, thousands	\$15	\$15
Bismuth, metal including alloys, all forms	do.	\$77	\$76 Netherlands \$1.
Cadmium, metal including alloys, all forms	do.	\$101	\$100 Germany \$1.
Chromium:			
Ore and concentrate		5,526	997 South Africa 3,201; Philippines 1,293; Spain 35.
Oxides and hydroxides		4,760	4,355 China 69; Colombia 62; Spain 58.
Metal including alloys, all forms		47	43 China 2; Russia 1; United Kingdom 1.
Cobalt:			
Ore and concentrate	value, thousands	\$1	-- All from France.
Oxides and hydroxides		267	134 Belgium-Luxembourg 93; Finland 31; France 5.
Metal including alloys, all forms		158	115 Congo (Kinshasa) 29; Finland 5; Canada 3.
Copper:			
Ore and concentrate		100,661	2,501 Chile 82,414; Canada 15,730; Germany 14.
Matte and speiss including cement copper		4,785	4,785
Oxides and hydroxides		490	302 Singapore 120; Italy 3; unspecified Asia 60.
Sulfate		252	108 Belgium-Luxembourg 76; Italy 26; Germany 21.
Metal including alloys:			
Scrap		62,220	59,771 Colombia 704; Guatemala 567; Ecuador 416.
Unwrought		184,534	18,475 Chile 144,040; Peru 14,104; South Africa 7,634.
Semimanufactures		98,747	86,969 Germany 2,147; Japan 1,083; unspecified 1,508.
Gold, metal including alloys, unwrought and partly wrought	value, thousands	\$262,973	\$256,286 Canada \$3,466; Switzerland \$1,410; Singapore \$1,250.
Iron and steel:			
Ore and concentrate, excluding iron pyrite	thousand tons	3,955	7 Brazil 3,440; Peru 341; Chile 167.
Metal:			
Scrap	do.	1,280	1,167 Netherlands 29; United Kingdom 26; Sweden 22.
Pig iron, cast iron, related materials		739,667	13,819 China 214,357; Venezuela 128,985; India 120,010.
Ferroalloys:			
Ferrosilicomanganese		8,154	1,676 South Africa 2,348; Russia 1,353; China 645.
Ferromanganese		15,151	250 South Africa 8,828; France 3,460; China 1,644.
Ferromolybdenum		1,119	252 China 689; Chile 126; United Kingdom 37.
Ferronickel		31	17 Russia 10; Italy 2; United Kingdom 2.
Ferriobium		699	1 Brazil 695; Canada 2; United Kingdom 1.
Ferrosilicomanganese		25,967	16 Ukraine 17,786; China 3,378; South Africa 2,759.
Ferrosilicon		31,062	4,064 Brazil 13,248; Venezuela 10,522; Russia 1,308.
Ferrotitanium and ferrosilicotitanium		477	135 United Kingdom 215; Russia 82; Germany 42.
Ferrotungsten and ferrosilicotungsten		23	23
Ferrovandium		856	113 Austria 200; South Africa 145; China 128.
Silicon metal		6,244	375 China 4,109; Brazil 1,674; United Kingdom 71.
Unspecified		5,606	1,321 Brazil 1,321; France 1,012; China 911.
Steel, primary forms		773,613	14,574 Brazil 355,278; Russia 194,932; unspecified 66,571.
Semimanufactures:			
Bars, rods, angles, shapes, sections	thousand tons	1,023	269 Canada 149; Ukraine 138; Trinidad and Tobago 76.
Rails and accessories		118,758	67,468 Russia 19,006; France 16,517; Canada 9,577.
Wire		45,265	24,451 France 4,822; Belgium-Luxembourg 2,196; Japan 1,695.
Tubes, pipes, fittings		479,963	282,529 Republic of Korea 42,972; Japan 39,442; Argentina 39,131.

See footnotes at end of table.

TABLE 4--Continued  
MEXICO: 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:				
Of iron or nonalloy steel:				
Not clad, plated, coated	thousand tons	1,235	317	Russia 203; Japan 113; Republic of Korea 101.
Clad, plated, coated		492,701	252,053	Brazil 33,896; Venezuela 26,180; Republic of Korea 21,010.
Of alloy steel	value, thousands	\$494,045	\$226,597	Germany \$73,314; Japan \$49,196; Republic of Korea \$23,087.
Lead:				
Ore and concentrate		26,615	14,762	Peru 11,853.
Oxides		867	591	France 185; Argentina 73; United Kingdom 19.
Metal including alloys:				
Unwrought	value, thousands	\$53,648	\$53,586	Netherlands \$30; Germany \$5; unspecified Asia \$14.
Semimanufactures	do.	\$9,383	\$8,753	Germany \$108; Sweden \$87; unspecified Asia \$300.
Lithium oxides and hydroxides		2,347	2,336	Unspecified Asia 11.
Magnesium, metal including alloys:				
Scrap		60	58	Germany 2.
Unwrought		2,474	144	China 2,161; Canada 806; United Kingdom 122.
Semimanufactures		1,699	1,319	Canada 355; China 13; Austria 8.
Manganese:				
Ore and concentrate		78,176	2,543	Australia 67,155; Ghana 8,460; China 18.
Oxides		18,029	2,227	Gabon 8,500; Brazil 4,427; China 1,122.
Metal including alloys, all forms		905	147	China 539; United Kingdom 123; South Africa 68.
Mercury		188	186	Netherlands 1; Russia 1.
Molybdenum:				
Ore and concentrate:				
Roasted		33	12	Chile 21.
Unroasted		4	2	Austria 1.
Oxides and hydroxides		127	125	Germany 1.
Metal including alloys:				
Unwrought,		155	3	United Kingdom 84; Netherlands 59; Sweden 8.
Semimanufactures		80	76	Belgium-Luxembourg 2; Canada 1.
Nickel:				
Ore and concentrate		4	1	Norway 3.
Matte and speiss		44	11	Unspecified 32.
Oxides and hydroxides		262	188	Canada 53; Sweden 16; Netherlands 3.
Metal including alloys:				
Scrap		1	1	
Unwrought		2,277	194	Canada 981; Russia 532; Norway 252.
Semimanufactures	value, thousands	\$24,301	\$20,141	Germany \$1,182; Canada \$1,089; United Kingdom \$467.
Platinum-group metals, including alloys, unwrought and partly wrought:				
Palladium	do.	\$224	\$205	South Africa \$11; Canada \$8.
Platinum	do.	\$2,959	\$2,931	Canada \$17; Japan \$7; South Africa \$3.
Rhodium	do.	\$13	\$7	Italy \$6.
Iridium, osmium, ruthenium	do.	\$1	\$1	
Rare-earth, metals including alloys, all forms		48	44	Hong Kong, China 3; China 1.
Selenium, elemental		67	49	United Kingdom 12; China 4; Belgium-Luxembourg 2.
Silicon, high-purity		42	38	United Kingdom 4.
Silver:				
Ore and concentrate	value, thousands	\$1,766	\$30	Peru \$1,736.
Metal including alloys, unwrought and partly wrought	do.	\$6,618	\$4,981	Peru \$1,326; Germany \$215; Italy \$38.
Tantalum, metal including alloys, all forms	do.	\$208,659	\$208,654	Germany \$3; Austria \$2.
Tin:				
Ore and concentrate		152	51	Bolivia 101.
Metal including alloys:				
Scrap		55	55	
Unwrought		2,922	2,643	Bolivia 184; United Kingdom 31; Malaysia 24.
Semimanufactures		1,119	908	Malaysia 68; Belgium-Luxembourg 22; China 22.

See footnotes at end of table.

TABLE 4--Continued  
MEXICO: IMPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Sources		
		United States	Other (principal)	
METALS--Continued				
Titanium:				
Ore and concentrate	176,229	5,185	Australia 154,252; Ukraine 15,000; Canada 5,185.	
Oxides	11,636	9,934	Germany 940; China 390; Italy 103.	
Metal including alloys, all forms	250	124	United Kingdom 65; Germany 36; Italy 20.	
Tungsten:				
Ore and concentrate	value, thousands	\$1	\$1	
Metal including alloys:				
Unwrought		35	22	Canada 8; Italy 4; Germany 1.
Semimanufactures		229	221	Singapore 3; Austria 1; Germany 1.
Vanadium:				
Oxides and hydroxides		47	2	Spain 37; South Africa 7; China 1.
Metal including alloys, all forms	value, thousands	\$1,088	\$1	United Kingdom \$1,080; Germany \$7.
Zinc:				
Ore and concentrate	do.	\$159	\$158	Canada \$1.
Oxides		1,818	1,384	Republic of Korea 104; Canada 94; Venezuela 85.
Blue powder		47	19	Belgium-Luxembourg 19; Italy 5; United Kingdom 4.
Ash and residue		110,710	110,710	
Metal including alloys:				
Scrap		385	365	Peru 20.
Unwrought		24,829	461	Kazakhstan 12,027; Russia 6,487; Argentina 3,074.
Semimanufactures		3,751	3,022	China 490; Italy 77; unspecified Asia 90.
Zirconium:				
Ore and concentrate		1,502	405	Italy 883; Switzerland 124; Spain 24.
Metal including alloys, semimanufactures		57	53	Germany 3.
Other:				
Ores and concentrates		106	106	
Ashes and residues		1,355	1,274	Germany 64; China 16.
INDUSTRIAL MINERALS				
Abrasives, n.e.s.:				
Natural, corundum, emery, pumice, etc.		11,820	11,100	Canada 233; Italy 213; Germany 83.
Artificial:				
Corundum		20,173	7,537	China 8,809; Brazil 1,881; Austria 1,331.
Silicon carbide		8,764	1,031	China 5,795; Brazil 1,030; Argentina 807.
Dust and powder of precious and semiprecious stones including diamonds	value, thousands	\$1,292	\$1,095	Ireland \$96; United Kingdom \$35; Ghana \$19.
Grinding and polishing wheels and stones		6,500	4,231	Italy 604; China 338; unspecified Asia 276.
Asbestos, crude		29,102	954	Canada 23,964; Brazil 2,958; Zimbabwe 654.
Barite and witherite		30,386	4,577	India 25,142; China 471; United Kingdom 147.
Boron:				
Crude natural borates		2,678	928	Chile 1,053; Argentina 400; Turkey 283.
Oxides and acids		11,346	10,190	Chile 907; Peru 221; Germany 8.
Cement		41,294	36,986	France 1,276; China 1,244; Croatia 700.
Chalk		146	127	Germany 18; France 1.
Clays, crude:				
Bentonite		45,057	22,145	India 22,000; United Kingdom 670; Spain 192.
Chamotte earth and dinas earth		1	--	All from United Kingdom.
Fire clay		138,014	131,722	China 6,113; Germany 95; Brazil 43.
Fuller's earth		1,074	993	Spain 39; Morocco 30; Italy 12.
Kaolin		338,176	333,988	Spain 2,462; France 855; Italy 538.
Other		46,502	46,275	Afghanistan 53; United Kingdom 53; China 34.
Cryolite and chiolite		39	31	Spain 8.
Diamond, natural:				
Gem, not set or strung	value, thousands	\$37,420	\$34,107	South Africa \$1,838; Belgium-Luxembourg \$609; Tanzania \$281
Industrial stones	do.	\$3,110	\$2,903	Ghana \$62; Australia \$32; Congo (Kinshasa) \$26.
Dust and powder	do.	\$1,261	\$1,064	Ireland \$96; United Kingdom \$35; Ghana \$19.
Diatomite and other infusorial earth		3,561	3,535	United Kingdom 22; Canada 3; Germany 1.
Feldspar		1,195	1,143	Canada 44; Germany 8.
Fertilizer materials:				
Crude, n.e.s.		444	401	Switzerland 28; Spain 15.

See footnotes at end of table.

TABLE 4--Continued  
MEXICO: IMPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Sources	
		United States	Other (principal)
<b>INDUSTRIAL MINERALS--Continued</b>			
Fertilizer materials--Continued:			
Manufactured:			
Ammonia	3,937	1,834	Japan 2,071; Canada 28.
Nitrogenous		--	
Phosphatic	34,047	33,939	China 60; Norway 48.
Potassic	321,744	268,935	Canada 32,583; Russia 14,298; Chile 4,507.
Unspecified and mixed	791,552	350,447	Russia 294,320; Chile 44,422; Israel 19,540.
Fluorspar	37,198	6,403	China 19,662; Kenya 11,102.
Graphite, natural	4,032	1,660	China 1,527; Italy 317; Madagascar 223.
Gypsum and plaster	28,389	27,805	Guatemala 347; Japan 135; Italy 58.
Iodine	6,833	6,655	Chile 148; Germany 19; Japan 11.
Kyanite and related materials:			
Mullite	3,785	3,759	Germany 26.
Unspecified	2,300	2,281	China 10; Japan 6; Venezuela 3.
Lime	15,292	15,209	North Korea 57; Japan 21; unspecified Asia 4.
Magnesium compounds:			
Magnesite, crude	1,023	347	Canada 396; China 251; Norway 17.
Oxides and hydroxides	38,693	5,648	China 32,270; Czech Republic 344; Austria 135.
Other	3	1	Germany 2.
Mica:			
Crude including splittings and waste	1,436	1,143	Canada 128; Morocco 95; United Kingdom 35.
Worked including agglomerated splittings	347	293	Belgium-Luxembourg 33; India 7; Republic of Korea 6.
Nitrates, crude	2,632	78	Chile 2,554.
Phosphates, crude	thousand tons 2,139	(2/)	Morocco 2,138.
Phosphorus, elemental	4,086	3,031	China 990; India 41; Italy 24.
Pigments, mineral:			
Natural, crude	135	114	Canada 20.
Iron oxides and hydroxides, processed	6,408	5,951	Republic of Korea 120; Germany 65; Belgium-Luxembourg 47.
Potassium salts, crude	146	146	
Precious and semiprecious stones other than diamond:			
Natural	value, thousands \$10,625	\$7,734	Thailand \$855; Colombia \$648; Tanzania \$536.
Synthetic	do. \$5,951	\$4,648	Thailand \$663; Austria \$232; China \$86.
Pyrite, unroasted	270	125	Austria 124; Italy 21.
Quartz crystal, piezoelectric	value, thousands \$813	\$813	
Salt and brine	64,858	64,215	Canada 278; Republic of Korea 185; Israel 95.
Sodium compounds, n.e.s.:			
Soda ash, manufactured	643,576	643,551	Germany 18; United Kingdom 5.
Sulfate, manufactured	20,437	19,565	Canada 834; Germany 22; Italy 17.
Stone, sand and gravel:			
Dimension stone:			
Crude and partly worked	15,878	9,171	Italy 1,038; Guatemala 887; unspecified 3,854.
Worked	43,808	18,580	Spain 10,248; Italy 8,033; Brazil 2,016.
Dolomite, chiefly refractory-grade	432,950	17,900	Canada 413,892; Guatemala 1,086; Italy 42.
Gravel and crushed rock	21,618	20,460	France 434; Italy 410; Guatemala 2.
Limestone other than dimension	65,851	390	Dominican Republic 65,459.
Quartz and quartzite	513	85	United Kingdom 120; Belgium-Luxembourg 111; Brazil 71.
Sand other than metal-bearing	469,449	467,470	Netherlands 785; China 301; unspecified Asia 246.
Sulfur:			
Elemental:			
Crude including native and byproduct	645,476	79,677	Canada 554,380; Japan 10,030; Australia 761.
Colloidal, precipitated, sublimed	1,044	1,042	Argentina 1; Germany 1.
Dioxide	230	164	China 64; Japan 1.
Sulfuric acid	230,801	22,346	Republic of Korea 106,926; Sweden 44,967; Canada 27,242.
Talc, steatite, soapstone, pyrophyllite	113,763	99,550	China 15,477; Australia 1,420; Canada 105.
Vermiculite, perlite, chlorite	7,661	4,648	China 1,995; Brazil 88; Canada 52.
Other:			
Crude	59,873	50,201	South Africa 2,703; Australia 2,087; Italy 1,467.
Slag and dross, not metal-bearing:			
Granulated slag (slag sand) from iron and steel industry	9,498	4,496	Italy 5,000.
Waste, scale, dross, slag of iron or steel industry	21,495	1,487	South Africa 20,001; Italy 7.

See footnotes at end of table.

TABLE 4--Continued  
MEXICO: IMPORTS OF MINERAL COMMODITIES IN 1998 1/

(Metric tons unless otherwise specified)

Commodity	Total	Sources	
		United States	Other (principal)
<b>INDUSTRIAL MINERALS--Continued</b>			
Other--Continued:			
Slag and dross, not metal-bearing--Continued:			
Slag and ash, n.e.s., including seaweed ash (kelp)	18,033	18,032	United Kingdom 1.
<b>MINERAL FUELS AND RELATED MATERIALS</b>			
Asphalt and bitumen, natural	25,970	25,956	China 8; Germany 4; United Kingdom 1.
Carbon black	15,120	12,478	Venezuela 1,032; Colombia 772; Germany 285.
Coal:			
Anthracite	8,319	7,995	Vietnam 240; Japan 58; Italy 26.
Bituminous thousand tons	2,293	1,335	Australia 563; Canada 244; Colombia 151.
Briquets of anthracite and bituminous coal	34,693	34,693	
Lignite including briquets	1,815	1,815	
All grades including briquets thousand tons	2,338	1,379	Australia 563; Canada 244; Colombia 151.
Coke and semicoke	589,129	153,839	China 376,720; Colombia 35,394; Vietnam 23,158.
Gas, natural:			
Gaseous thousand tons	1,168	1,168	
Liquefied	1,706	1,706	
Peat including briquets and litter	6,000	798	Canada 5,201.
Petroleum:			
Crude value, thousands	\$2	\$1	Ecuador \$1.
Refinery products:			
Liquefied petroleum gas thousand 42-gallon barels	40,065	32,193	Algeria 7,122; Venezuela 580; Malaysia 70.
Mineral jelly and wax do.	1,073	396	China 636; Malaysia 20; Germany 14.
Asphalt 42-gallon barels	579,918	579,887	United Kingdom 24.
Bitumen and other residues do.	582,051	581,912	Netherlands 109; United Kingdom 24.
Bituminous mixtures do.	120,533	119,006	Germany 1,127; China 42; unspecified Asia 170.
Petroleum coke thousand 42-gallon barels	2,674	2,673	Germany 1.
Unspecified do.	107,181	84,050	United Kingdom 4,912; Peru 3,465; Ecuador 3,208.

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

2/ Less than 1/2 unit.

Source: United Nations Statistical Office (microfiche).