

# Mercury

*William E. Brooks, the U.S. Geological Survey mercury commodity specialist, has compiled the following information on mercury, a commodity still widely used in industrial and mining applications.*

The ore of mercury, cinnabar, is soft and dark red, and native mercury is one of a few metals that is liquid at room temperatures. Cinnabar from Almaden, Spain, the world's oldest producing mercury mine, was used during Roman times, and the chemical symbol for mercury (Hg) is from "hydrargyrum," from the Greek word meaning liquid silver. Cinnabar and mercury are associated with some hydrothermal mineral deposits and occur in fine-grained or sedimentary and volcanic rocks near hot springs or volcanic centers. Mercury may be recovered as a byproduct of processing copper, gold, lead-zinc or silver.

Mercury amalgamates readily with silver and gold and, since Roman times, has been used for artisanal or small-scale gold mining in many parts of the world. Mercury from Almaden was used for Spanish colonial gold and silver processing in the New World, and the cinnabar deposits at Huancavelica, Peru, provided a regional source for this important metal. Since 1927, in conformance with the system used at Almaden, the "flask" has been the unique unit for measuring and pricing mercury. One flask weighs 34.5 kilograms, and 29 flasks comprise 1 metric ton.

Although mercury occurs widely in the United States, it has not been mined as a principal commodity since 1992. Domestic mercury is either produced as a byproduct of gold mining or is reclaimed and recycled from automobile convenience switches, batteries, computers, dental amalgam, fluorescent lamps, gym flooring, medical devices or thermostats. Tons of mercury-containing waste go into landfills in the United States and Canada.

In 2005, the U.S. reserve base of mercury of 7,000 metric tons composed an estimated 3 percent of the world reserve base, and the Defense National Stockpile has 4,436 metric tons of mercury in inventory; however, sales from the stockpile have been suspended. U.S. exports of mercury were estimated to be 278 metric tons in 2004.

U.S. manufacturers used 500 to 600 metric tons per year of recycled and imported mercury in the early 1990s. Now, the amount used is estimated to be less than 200 metric tons per year.

Analysts must estimate much of the data on mercury because it is a low-volume commodity that lacks careful tracking of its production, use and disposal. Prices and volumes of mercury used may change dramatically from year to year. For example, the average U.S. domestic price of mercury was \$150 per flask from 2000 to 2003, but rose sharply in 2004, peaking at \$850 per flask in the spring of 2005 before falling to \$700 per flask by year-end.

Mercury has a long history of use for industrial, medical and mining applications; however, because of its effect on human health, its continued use is in question. Non-mercury substitutes are available. For example, digital thermometers substitute for mercury thermometers, and ceramic material substitutes for dental amalgam. Increased reclamation and recycling of

byproduct mercury from mining and metals processing and from used mercury-containing products will reduce risks to the environment.

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Sample of cinnabar, primary ore of mercury. Image from *Minerals in Your World*.