

Barite

M. Michael Miller, the barite commodity specialist for the U.S. Geological Survey, has prepared the following information on barite, which plays an important role in the exploration for oil and gas.

Also called barytes, barite forms in various geologic environments and is frequently found with both metallic and nonmetallic minerals. Most barite is produced by open-pit mining techniques, and most crude barite requires some upgrading to meet minimum purity or specific gravity levels.

Because of its high specific gravity, most barite (whether domestically mined or imported) is ground to a small uniform size for use as a weighting agent in petroleum well-drilling mud. Drilling mud is used in rotary drilling and pumped down through the drill pipe to remove rock cuttings and to lubricate the drill bit. Barite is added to increase the mud weight, which maintains the conditions necessary to prevent any gas, oil or saltwater from entering from high-pressure zones. Barite intended for this market must meet specifications set by the American Petroleum Institute.

The majority of U.S. barite grinding mills are located along the coast of the Gulf of Mexico, which allows convenient delivery of shipments from overseas suppliers. In the United States, about 95 percent of barite is consumed by petroleum well-drilling markets, and the remaining 5 percent for such industrial end-uses as barium chemicals, filler in paint and plastics, powder coatings, friction products (brake pads) for cars and trucks, and heavy aggregate for radiation shielding.

World barite production was about 8 million metric tons in 2005. China, India, the United States and Morocco, in descending order, were the leading producers and accounted for 85 percent of the total. Other significant producing countries included Iran, Mexico, Turkey and Vietnam.

Barite mining in the United States occurs predominantly in Nevada at three mines located in Elko and Lander counties, and some production is reported from a small barite mine in Georgia. In 2005, U.S. production was 489,000 metric tons and apparent consumption was nearly 3.1 million metric tons. Imports of crude barite totaled 2.57 million metric tons and were supplied by China (89 percent), India (10 percent), and Morocco (1 percent). Domestic consumption has increased by 60 percent since 2002 primarily as a result of the boom in exploration drilling for natural gas.

Worldwide, oil and gas drilling account for 85 to 90 percent of barite consumption. The non-drilling markets for barite are larger outside of the United States, particularly in China and Europe, which have significant production of barium chemicals. Data on non-drilling uses of barite are not readily available, but based strictly on increased drill rig activity, worldwide consumption of barite outside of North America is estimated to have increased in 2005. The areas that experienced the largest growth in the average number of drill rigs operating were Canada, the Far East and Latin America.

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Sample of barite crystal. Image from USGS.