

History

Silver has been used for jewellery, ornaments and currency for millennia. Archaeologists have identified sites where silver was produced as far back as the 4th millennium BC in Iranⁱ. Other ancient silver extraction and production sites have been identified in Asia Minor and around the Aegean Sea from before 2500 BC. Silver formed the basis of the Roman Empires monetary system and was mined and circulated at quantities which would not be achieved again until the Spanish began mining the New World over a thousand years later.

Geology

Silver is found in a wide variety of minerals and is most concentrated in acanthine and chlorargyriteⁱⁱ. Silver can also be found as native metal however this is much rarer. Most commonly Silver is produced in conjunction with, or a by-product of, other metals. In fact half of the world silver production comes from lead, copper, zinc ores. Additionally, where gold is found silver is almost always alloyed with it, where the silver content exceeds 20 per cent, the alloy is known as electrumⁱⁱⁱ.

The world's major silver producers are Mexico, Peru and the USA. Australia is ranked fourth, supplying approximately 1720 t of silver in 2000 representing around 10 per cent of world production.

Properties

It is a silver-white colour and produced a highly lustrous sheen when polished. Of all metals silver is the greatest conductor of heat and electricity. It is also the second most malleable and ductile metal behind gold. These characteristics make it highly useful in industrial applications. However, it tarnishes easily when exposed to air by forming a corrosion resistant coating of silver sulphide. Silver's purity is expressed as its fineness (e.g. sterling silver is 925 fine or 925 parts silver and 75 parts copper).



Natural silver nugget, approximately 1 gram. Original size in cm: 0.5 x 1.2

Source: Hi-Res Images of Chemical Elements – A Virtual Museum

<http://images-of-elements.com/silver.php>



1000oz silver bullion bar.

Source: Wikimedia Commons

The ions released by silver also have remarkable antibacterial properties. Thanks to this silver has been used for medical purposes to treat infections and wounds as well as to preserve water and food since ancient times. These uses diminished with the advent of modern antibiotics^{iv}.

Use

The most common application of silver is photography, where it is used in the silver halide salts (silver bromide, silver chloride and silver iodide) which darken on exposure to light and are used in emulsions for photographic paper, plates and film. As such, industrial uses of silver commonly consume the metal; unlike the use of gold where it is readily recyclable. Other common uses of silver include jewellery, tableware and ornaments. It is also used in electronics, braising alloys and batteries. Historically silver played a major role in coinage, including pre-decimal Australian coins and the original 1966 round 50 cent coin. Due to the rising silver price, silver is no longer used in general coinage. However, silver is still widely used to produce silver bullion coins for use by investors and collectors.

Victoria

In Victoria silver has historically been mined as a by-product of gold mining and when silver prices have been high. Native silver has been found in small specks and filaments at St Arnaud, Glendhu and Omeo. The silver chlorides cerargyrite (AgCl) and embolite [Ag (Br,Cl)] have been found at St Arnaud, and jamesonite (Pb,Ag)₄FeSb₆S₁₄ in lodes near Omeo. In Victoria's lead deposits it is common to find silver-bearing galena, which can contain one per cent or more of silver^v. Silver has been found in the volcanic associated massive sulphide deposits in Wilga and Currawong and in the Limestone Creek area northeast of Omeo^{vi}. Mining took place at the Wilga deposit between 1993 and 1996.

ⁱ Vatandoust. A, Parzinger. H, & Helwing. B (Ed.). (2011) *Early mining and metallurgy on the western Central Iranian Plateau: the first five years of work*. Zabern Philipp von GmbH.

ⁱⁱ John W. Anthony, Richard A. Bideaux, Kenneth W. Bladh, and Monte C. Nichols, Eds. (2012), *Handbook of Mineralogy*, Mineralogical Society of America, Chantilly, USA. <http://www.handbookofmineralogy.org>.

ⁱⁱⁱ South Australian Department for Manufacturing, Innovation, Trade, Resources and Energy (2012), DMITRE Minerals, *Silver*, http://www.pir.sa.gov.au/minerals/geological_survey_of_sa/commodities/silver

^{iv} Alexander JW (2009) *History of the Medical Use of Silver*, *Surgical Infections*, Volume 10, Number 3

^v Victorian Department of Primary Industries (DPI) (2012), Earth Resources, *Molybdenum* <http://www.dpi.vic.gov.au/earth-resources/minerals/metals/molybdenum>

^{vi} Ibid DPI.