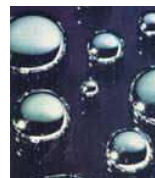


Mercury - Hg

Chemical properties of mercury - Health effects of mercury - Environmental effects of mercury

Atomic number	80
Atomic mass	200.59 g.mol ⁻¹
Electronegativity according to Pauling	1.9
Density	13.6 g.cm ⁻³ at 20°C
Melting point	- 38.9 °C
Boiling point	356.6 °C
Vanderwaals radius	0.157 nm
Ionic radius	0.11 nm (+2)
Isotopes	12
Electronic shell	[Xe] 4f ¹⁴ 5d ¹⁰ 6s ²
Energy of first ionisation	1004.6 kJ.mol ⁻¹
Energy of second ionisation	1796 kJ.mol ⁻¹
Energy of third ionisation	3294 kJ.mol ⁻¹
Standard potential	+ 0.854 V (Hg ²⁺ / Hg)
Discovered by	The ancients



Mercury

Mercury is the only common metal which is liquid at ordinary temperatures. Mercury is sometimes called quicksilver. It is a heavy, silvery-white liquid metal. It is a rather poor conductor of heat if compared with other metals but it is a fair conductor of electricity. It alloys easily with many metals, such as gold, silver, and tin. These alloys are called amalgams.

The most important mercury salts are mercuric chloride HgCl₂ (corrosive sublimate - a violent poison), mercuric chloride Hg₂Cl₂ (calomel, still used in medicine occasionally), mercury fulminate (Hg(ONC)₂, a detonator used in explosives) and mercuric sulphide (HgS, vermilion, a high-grade paint pigment).

Applications

Mercury metal has many uses. Because of its high density it is used in barometers and manometers. It is extensively used in thermometers, thanks to its high rate of thermal expansion that is fairly constant over a wide temperature range. Its ease in amalgamating with gold is used in the recovery of gold from its ores.

Industry uses mercury metal as a liquid electrode in the manufacture of chlorine and sodium hydroxide by electrolysis of brine. Mercury is still used in some electrical gear, such as switches and rectifiers, which need to be reliable, and for industrial catalysis. Much less mercury is now used in consumer batteries and fluorescent lighting, but it has not been entirely eliminated.

Mercury compounds have many uses. Calomel (mercurous chloride, Hg₂Cl₂) is used as a standard in electrochemical measurements and in medicine as a purgative. Mercuric chloride (corrosive sublimate, HgCl₂) is used as an insecticide, in rat poison, and as a disinfectant. Mercuric oxide is used in skin ointments. Mercuric sulphate is used as a catalyst in organic chemistry. Vermilion, a red pigment, is mercuric sulphide; another crystalline form of the sulphide (also used as a pigment) is black. Mercury fulminate, Hg(CNO)₂, is used as a detonator.

Mercury in the environment

Mercury occurs uncombined in nature to a limited extent. It rarely occurs free in nature and is found mainly in cinnabar ore (HgS) in Spain, Russia, Italy, China and Slovenia. World production of mercury is around 8.000 tonnes per year. Mineable reserves are around 600.000 tonnes.

Mercury is a compound that can be found naturally in the environment. It can be found in metal form, as mercury salts or as organic mercury compounds.

Mercury enters the environment as a result of normal breakdown of minerals in rocks and soil through exposure to wind and water. Release of mercury from natural sources has remained fairly the same over the years. Still mercury concentrations in the environment are increasing; this is ascribed to human activity.

Most of the mercury released from human activities is released into air, through fossil fuel combustion, mining, smelting and solid waste combustion. Some forms of human activity release mercury directly into soil or water, for instance the application of agricultural fertilizers and industrial wastewater disposal. All mercury that is released in the environment will eventually end up in soils or surface waters.

Mercury is not naturally found in foodstuffs, but it may turn up in food as it can be spread within food chains by smaller organisms that are consumed by humans, for instance through fish. Mercury concentrations in fish usually greatly exceed the concentrations in the water they live in. Cattle breeding products can also contain eminent quantities of mercury. Mercury is not commonly found in plant products, but it can enter human bodies through vegetables and other crops, when sprays that contain mercury are applied in agriculture.