Stable isotopes of mercury available from ISOFLEX

Isotope	Z(p)	N(n)	Atomic Mass	Natural Abundance	Enrichment Level	Chemical Form
Hg-196	80	116	195.965814	0.15%	51.00-95.00%	Metal
Hg-196	80	116	195.965814	0.15%	51.00-95.00%	Oxide
Hg-198	80	118	197.966752	9.97%	94.00-99.00%	Metal
Hg-198	80	118	197.966752	9.97%	94.00-99.00%	Oxide
Hg-199	80	119	198.968262	16.87%	≥90.00%	Metal
Hg-199	80	119	198.968262	16.87%	≥90.00%	Oxide
Hg-200	80	120	199.968309	23.10%	≥95.00%	Metal
Hg-200	80	120	199.968309	23.10%	≥95.00%	Oxide
Hg-202	80	122	201.970625	29.86%	≥99.00%	Metal
Hg-202	80	122	201.970625	29.86%	≥99.00%	Oxide
Hg-204	80	124	203.973475	6.87%	≥96.00%	Metal
Hg-204	80	124	203.973475	6.87%	≥96.00%	Oxide

Mercury was known and used in ancient civilizations. It has been found in Egyptian tombs dated from 1500 BC; the Greeks used it in ointments; and the Romans used it in cosmetics. It is named for the planet *Mercury*, and its symbol, *Hg*, originates with the Latin word *hydrargyrum*, meaning “liquid silver.”

Mercury is an extremely heavy liquid, the only metal and one of only two elements that naturally occur as a liquid in ambient temperatures. It does not wet glass, and it forms tiny globules. It is insoluble in hydrochloric acid, water, alcohol and ether; soluble in sulfuric acid upon boiling; and readily soluble in nitric acid and lipids. Mercury is stable in dry air or oxygen at ordinary temperatures; however, in the presence of moisture, oxygen slowly attacks the metal, forming red mercury(II) oxide. When the metal is heated in air or oxygen (to about 350 ºC), it is gradually converted to its oxide. Mercury readily combines with halogens at ordinary temperatures, forming mercury(II) halides. Its metal forms both mercury(I) and mercury(II) salts. Dilute sulfuric acid has no effect on the metal; nor does air-free hydrochloric acid. Water has no effect on mercury; nor does molecular hydrogen. However, atomic hydrogen readily combines with mercury vapors when exposed to radiation from a mercury arc, forming hydride.

Some of the most important uses of mercury are in the electrical and electrolytic industries, including batteries and cells in portable radios, microphones, cameras, hearing aids, watches, smoke alarms, wiring and switching devices, mercury vapor lamps, fluorescent tubes, electrical discharge tubes, and mercury electrodes in electrolytic cells. Mercury cathodes are employed in the electrolysis of sodium chloride to produce caustic soda and chlorine. Another major use is in thermometers, manometers, barometers and other pressure-sensing devices. Mercury is also used as a catalyst in making urethane foams and vinyl chloride monomers; elemental mercury and its compounds have long been used as fungicides in paints and in agriculture; and its compounds are used in medicines, pigments and analytical reagents.

Elemental mercury and all of its compounds are highly toxic by all routes of exposure. The element has significant vapor pressure at ambient temperatures that can produce a severe inhalation hazard. Symptoms from short exposure to high concentrations of mercury vapors include bronchitis, coughing, chest pain, respiratory distress, salivation, diarrhea, tremors, insomnia and depression. Mercury can cause damage to the kidneys, liver, lungs and brain. Organomercury compounds and inorganic salt solutions can be absorbed into the body through skin contact, causing severe poisoning. It accumulates as Hg^{2+} in the brain and kidneys. The United States Environmental Protection Agency has classified mercury as one of the priority pollutant metals.

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Isotopes for Science, Medicine and Industry

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Properties of Mercury

Name	Mercury
Symbol	Hg
Atomic number	80
Atomic weight	200.59
Standard state	Liquid at 298 ºK (the heaviest known element liquid)
CAS Registry ID	7439-97-6
Group in periodic table	12
Group name	None
Period in periodic table	6
Block in periodic table	d-block
Color	Silvery white
Classification	Metallic
Melting point	-38.842 °C
Boiling point	356.58 °C
Thermal conductivity	8.3 W/(m·K) at 298.2 °K
Electrical resistivity	98.4 μΩ·cm at 50 °C
Electronegativity	1.9
Specific heat	0.14 kJ/kg K
Heat of vaporization	59.0 $kJ \cdot mol^{-1}$ at 356.58 °C
Heat of fusion	11.3 kJ/kg
Density of liquid	13.53 g/cm^3
Electron configuration	$[Xe]4f^{14}5d^{10}6s^2$
Atomic radius	1.51 Å
Ionic radius	Hg^{2+}: 1.16 Å (coordination number 6)
Ionization potential	10.437 eV (1st) and 18.756 eV (2nd)
Oxidation states	+1, +2
Critical temperature	1477 ºC
Critical pressure	732 atm
Critical volume	43 cm^3/mol

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