

Stable isotopes of iridium available from ISOFLEX

Isotope	Z(p)	N(n)	Atomic Mass	Natural Abundance	Enrichment Level	Chemical Form
Ir-191	77	114	190.960591	37.30%	>93.00%	Metal
Ir-193	77	116	192.962923	62.70%	>93.00%	Metal

Other isotopes of iridium available from ISOFLEX

Isotope	Z(p)	N(n)	Atomic Mass	Half-life	Specific Activity	Form
<u>Ir-192</u>	77	115	191.962602	73.83 days	~550-600 curies/g at calibration	Iridium metal discs



Iridium was discovered in 1803 by French chemists Victor Collet-Descotils, Antoine François Comte de Fourcroy and Louis Nicolas Vauquelin, and British scientist Smithson Tennant. It is named for Iris, the Greek winged goddess of the rainbow and messenger of the Olympic gods.

A silver-white metal with low ductility and close-packed cubic crystals, iridium does not tarnish in air. On heating strongly, a slightly volatile oxide is formed. It is insoluble in acid and slowly soluble in *aqua regia* and in fused alkalis. It is the most corrosion-resistant element and is highly resistant to chemical attack at ordinary temperatures. At elevated temperatures (near 600 °C), iridium metal combines with oxygen to form a coating of iridium dioxide. Similarly, the metal reacts with halogens only at elevated temperatures. Iridium forms alloys with several metals, mostly platinum group metals. Iridium does not react with concentrated acids or with molten alkalis.

The most important use of iridium is as an alloying metal for platinum and palladium. Iridium enhances the resistance of platinum to chemical attack and corrosion, as well as its enhancing hardness and tensile strength. Such alloys are used for jewelry, decorative purposes, electrical contacts, thermocouples, crucibles, electrodes, hypodermic needles and medical accessories. The radioisotope Iridium-192 is used in the examination of ferrous welds and in other radiographic applications.

Properties of Iridium

Name	Iridium
Symbol	Ir
Atomic number	77
Atomic weight	192.22

Properties of Iridium (continued)

Standard state	Solid at 298 °K
CAS Registry ID	7439-88-5
Group in periodic table	9
Group name	Precious metal or platinum group metal
Period in periodic table	6
Block in periodic table	d-block
Color	Silvery white
Classification	Metallic
Melting point	2410 °C
Boiling point	4130 °C
Vaporization point	4130 °C
Thermal conductivity	147.00 W/(m·K) at 298.2 °K
Electrical resistivity	5.30 μΩ·cm at 20 °C
Electronegativity	2.2
Specific heat	0.133 kJ·mol ⁻¹ at 20 °C
Heat of vaporization	560.00 kJ·mol ⁻¹ at 4130 °C
Heat of fusion	26.00 kJ·mol ⁻¹
Density of liquid	19.00 g/cm ⁻³ at 2410 °C
Density of solid	22.42 g/cm ³ (highest among metals)
Mohs hardness scale	6.0-6.5
Electron configuration	[Xe]4f ¹⁴ 5d ⁷ 6s ²
Oxidation states	0, +1, +2, +3, +4, +5, +6
Common oxidation states	+3, +4