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Tantalum
180.948

Key Properties

Atomic Mass	180.948
Category	Transition Metals
State at 20°C	solid
Melting Point	3017°C
Boiling Point	5455°C
Density	16.69
Electron Config	[Xe] 4f145d36s2
Electronegativity	1.5
Year Discovered	1802
Discovered By	Anders Gustaf Ekeberg

Did You Know?

- 1 It is named after Tantalus, a villain from Greek mythology who was condemned to eternal punishment, because the element was so frustratingly difficult to isolate.
- 2 Tantalum is highly biocompatible and extremely resistant to corrosion by body fluids, making it ideal for surgical implants, such as artificial joints and cranial plates.
- 3 It is a critical component in small, high-performance capacitors used in a vast range of portable electronics, including smartphones, laptops, and cameras.
- 4 Tantalum has a very high melting point and is highly ductile, meaning it can be drawn out into a very thin wire.
- 5 It is considered a 'conflict mineral' because much of it is mined in war-torn regions like the Democratic Republic of Congo.

APPEARANCE

Tantalum is a hard, blue-gray, lustrous metal.

SUPERHERO PERSONA

"The Uncorrodible, a hero who can withstand any acid and is trusted to build implants inside the human body."

EVERYDAY CONNECTION

Tantalum is found in the tiny, high-performance capacitors in your smartphone.

POP CULTURE

Tantalum was famously difficult to isolate — its name comes from the tantalized Greek myth.

Tantalum: The Indestructible and Bio-Friendly Metal

Tantalum is a shiny, silvery metal known for being almost impossible to corrode. Its name comes from King Tantalus in Greek mythology—because tantalum refused to absorb acid in the same way Tantalus was "tantalized" by water he could never drink. This resistance to corrosion, plus its special oxide coating, makes tantalum essential for electronics, medicine, and high-tech engineering.

Why Is Tantalum Useful?

Tantalum's strength lies in its durability and its unique ability to form a super-thin oxide layer that acts as an insulator.

Electronics: Used to make tiny, high-performance capacitors in devices like phones, laptops, and tablets. Its oxide layer lets capacitors store a lot of charge in a very small space.

Medical Implants: Tantalum is biocompatible, meaning the body doesn't reject it. It's used in bone plates, skull plates, nerve repair wires, and even woven into surgical meshes.

Corrosion Resistance: Tantalum is so resistant to chemicals that it's used for equipment handling highly corrosive materials, as well as in neon light electrodes, rectifiers, and special lenses.

High-Performance Alloys: Tantalum alloys are extremely strong and are used in rocket nozzles, turbine blades, and the nose caps of supersonic aircraft.

Natural Abundance & History

Tantalum is rarely found pure. It's usually found in the mineral coltan (columbite-tantalite), which also contains its chemical "twin," niobium. Much of the world's tantalum is obtained as a by-product of tin mining.

1802 – Discovery: Swedish chemist Anders Gustav Ekeberg first identified tantalum.

Confusion with Niobium: For decades, scientists thought tantalum and niobium were the same element because they are so hard to separate.

1846 – Separation: German chemist Heinrich Rose proved they were different.

1903 – Pure Metal: The first truly pure sample of tantalum was produced by Werner von Bolton.

Biological Role

Tantalum has no known biological role, but it is non-toxic and completely safe to use in the human body.