

**Key Properties**

Atomic Mass	204.38
Category	Post-Transition Metals
State at 20°C	solid
Melting Point	304°C
Boiling Point	1473°C
Density	11.85
Electron Config	[Xe] 4f145d106s26p1
Electronegativity	1.62
Year Discovered	1861
Discovered By	William Crookes

Did You Know?

- 1 It has been called the \
- 2 One of the classic signs of thallium poisoning is the loss of hair.
- 3 It was discovered spectroscopically by its brilliant green spectral line, and its name comes from the Greek 'thallos', meaning 'green twig'.
- 4 Despite its toxicity, it has been used in some specialty electronics and low-temperature thermometers.
- 5 The radioactive isotope thallium-201 is used in medical scans to assess heart muscle health.

APPEARANCE

Thallium is a soft, gray, malleable metal.

SUPERHERO PERSONA

"The Poisoner's Poison, a sinister villain who is tasteless, odorless, and mimics other illnesses."

EVERYDAY CONNECTION

Thallium is found as a component of some low-temperature thermometers.

POP CULTURE

Thallium was the murder weapon in Agatha Christie's *The Pale Horse*.

Thallium: The Soft, Poisonous Metal

Thallium is a soft, silvery-white metal that tarnishes quickly in air. It is extremely toxic, which has limited its use in modern times. Its name comes from the Greek word thallos, meaning "green shoot," because of the bright green line it produced in a spectral analysis.

Why Is Thallium Useful?

Even though it's poisonous, thallium's unique properties make it valuable in certain industries:

Electronics: Used in photoelectric cells, which convert light into electricity.

Glass: Thallium oxide produces glass with a high refractive index, ideal for optical lenses. It's also used in special low-melting glasses that stay fluid at very low temperatures.

Low-Temperature Alloys: An alloy of mercury with 8% thallium has a melting point of -60°C (20°C lower than mercury alone). This makes it useful in low-temperature thermometers and switches.

Pesticides (Historic Use): Thallium sulfate was once widely used as a rat poison, since it is odorless and tasteless. However, it has been banned in most countries due to its high toxicity.

Biological Role & Natural Abundance

Thallium has no biological role and is extremely dangerous to humans. It can replace potassium in the body, disrupting the nervous system, and is linked to cancer and birth defects.

It is found in small amounts in several ores, especially pyrites (used in sulfuric acid production). Most commercial thallium is obtained as a by-product of copper, zinc, and lead refining.

History of Discovery

1861 – First Signs: English chemist William Crookes detected a bright green spectral line while analyzing impure sulfuric acid, which revealed the presence of a new element.

1862 – Isolation: French chemist Claude-August Lamy carried out more detailed research and was the first to isolate pure metallic thallium. Because of his thorough work, the French Academy credited him with the discovery.

In the end, both Crookes and Lamy received medals for their contributions.