Technetium (Tc)

Element 43 — Complete Summary

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43
Tc
Technetium
[98]

Key Properties

Atomic Mass	[98]
Category	Transition Metals
State at 20°C	solid
Melting Point	2157°C
Boiling Point	4262°C
Density	11.5
Electron Config	[Kr] 4d55s2
Electronegativity	1.9
Year Discovered	1937
Discovered By	Carlo Perrier & Emilio Segrè

✨ Did You Know?

1. It was the very first element to be produced artificially in a laboratory, in 1937.
2. Its name comes from the Greek word 'technetos', which means 'artificial'.
3. It is the lightest element in the periodic table that has no stable isotopes; all of its forms are radioactive.
4. The isotope technetium-99m is the most commonly used medical radioisotope in the world, used in millions of diagnostic procedures every year to image organs like the brain, heart, and kidneys.
5. Despite being synthetic on Earth, it is naturally produced in some types of old, red giant stars.

APPEARANCE
Technetium is a silvery-gray, radioactive metal.

SUPERHERO PERSONA
"The Artificial Avenger, the first hero to be created in a lab rather than found in nature."

EVERYDAY CONNECTION
Technetium is found as a radioactive tracer used for medical imaging scans.

POP CULTURE
Technetium, being synthetic, represents humanity's ability to create new matter.

Technetium: The First Man-Made Element

Technetium is a silvery, radioactive metal and the first element ever created artificially. It has no stable isotopes, which is why it doesn't occur naturally on Earth. Its name comes from the Greek word technetos, meaning "artificial."

Why Is Technetium Useful?

Even though it's radioactive, technetium has some very important uses:

Medical Diagnostics: The isotope technetium-99m is one of the most widely used tools in modern medicine. It emits gamma rays, which can be detected by special cameras to create images of the heart, bones, kidneys, and other organs—all with minimal radiation exposure.

Corrosion Protection: Small amounts of technetium can dramatically increase the corrosion resistance of steel. Because of its radioactivity, this use is limited to sealed systems like pipelines in power plants.

Natural Abundance & History

Technetium is essentially absent from Earth's crust because all of its isotopes decay relatively quickly compared to the planet's age. A trace amount can be produced naturally in uranium ores, but not in mineable quantities.

Production Today: Technetium is made in large amounts as a by-product of nuclear reactors, extracted from spent uranium fuel rods.

Discovery (1937): Chemists had long searched for the missing element with atomic number 43. It was finally identified by Emilio Segrè and colleagues in Italy, who isolated it from molybdenum that had been bombarded with high-energy particles.

A Stellar Mystery: While technetium is rare on Earth, astronomers have detected it in the spectra of certain stars, proving that those stars are actively producing it through nuclear fusion.

Biological Role

Technetium has no biological role and is considered toxic because of its radioactivity.