Krypton (Kr)

Element 36 — Complete Summary

36
Kr
Krypton
83.798

Key Properties

Atomic Mass	83.798
Category	Noble Gases
State at 20°C	gas
Melting Point	−157.37°C
Boiling Point	−153.415°C
Density	3.749 g/L
Electron Config	[Ar] 3d104s24p6
Electronegativity	3.0
Year Discovered	1898
Discovered By	William Ramsay & Morris Travers

✨ Did You Know?

1. Its name comes from the Greek word 'kryptos', meaning 'the hidden one', because it was difficult to find and isolate.
2. Krypton is famously associated with Superman's home planet, although the real element has no connection to the comic book hero.
3. From 1960 to 1983, the official length of a meter was defined in terms of the wavelength of light emitted by krypton-86 atoms.
4. When an electric current is passed through krypton gas, it produces a smoky-white light, which is used in high-powered \
5. Krypton is one of the rarest gases in the Earth's atmosphere, making up only about one part per million.

APPEARANCE
Krypton is a colorless, odorless, tasteless inert gas.

SUPERHERO PERSONA
"The Hidden Hero, an elusive and noble hero, often mistaken for a superhero's one weakness."

EVERYDAY CONNECTION
Krypton is found in the high-intensity gas inside an airport runway light.

POP CULTURE
Krypton is the home planet of Superman though the real element has no relation.

Overview of Krypton

Krypton is a colorless, odorless noble gas with atomic number 36. It is one of the rarest gases in Earth’s atmosphere and belongs to the family of chemically inert elements. The name krypton comes from the Greek word kryptos, meaning “hidden,” which reflects its elusive nature when it was first discovered.

Why Is Krypton So Useful?

Although rare and mostly unreactive, krypton’s unique spectral and inert properties give it several specialized applications:

Lighting: Krypton is used as a filling gas in fluorescent lamps, high-performance bulbs, and flash lamps for high-speed photography.

Lasers: Krypton fluoride (KrF) is used in excimer lasers, which emit ultraviolet light. These are applied in nuclear fusion research, semiconductor manufacturing, and medical procedures.

Measurement standard: From 1960 to 1983, the isotope krypton-86 defined the international standard of length. One metre was officially measured as 1,650,763.73 wavelengths of a specific krypton spectral line.

Nuclear forensics: Radioactive krypton isotopes are a by-product of nuclear reactors. During the Cold War, scientists monitored atmospheric krypton levels to estimate nuclear material production.

Natural Abundance and Production of Krypton

Atmospheric rarity: Krypton makes up only about 1 part per million of Earth’s atmosphere.

Extraction: It is commercially obtained by the fractional distillation of liquid air, alongside other rare gases like neon and xenon.

History of Krypton

1898 – Discovery: British chemists William Ramsay and Morris Travers discovered krypton while investigating the constituents of liquefied air. By slowly evaporating the lighter gases, they were left with a residual fraction that revealed krypton’s presence.

Spectral confirmation: Its existence was confirmed through spectroscopy, which showed its distinctive spectral lines.

Biological Role of Krypton

Krypton has no known biological role and is considered non-toxic.