Argon (Ar)

Element 18 — Complete Summary

18

Ar

Argon

39.95

Key Properties

Atomic Mass	39.95
Category	Noble Gases
State at 20°C	gas
Melting Point	−189.34°C
Boiling Point	−185.848°C
Density	1.784 g/L
Electron Config	[Ne] 3s23p6
Electronegativity	null
Year Discovered	1894
Discovered By	Lord Rayleigh & William Ramsay

✨ Did You Know?

1. Its name comes from the Greek word 'argos', meaning 'lazy' or 'inactive', due to its chemical inertness.
2. It is the third-most abundant gas in Earth's atmosphere, after nitrogen and oxygen.
3. Incandescent light bulbs are filled with argon to prevent the hot tungsten filament from burning out.
4. Double-paned windows often have argon gas sealed between the panes to act as a thermal insulator.
5. Argon is used to create the blue and green light in some lasers.

APPEARANCE

A colorless, odorless, tasteless inert gas.

SUPERHERO PERSONA

"Captain Inert, the laziest of heroes, who refuses to react and protects hot-headed filaments in lightbulbs."

EVERYDAY CONNECTION

The gas inside an old-fashioned incandescent light bulb.

POP CULTURE

Used to create the blue light of the laser swords in the movie 'Tron'.

Overview of Argon

Argon is a colorless, odorless, and inert gas. Classified as a noble gas, it does not readily react with other substances, making it stable and versatile. Argon is the third most abundant gas in Earth’s atmosphere and is widely used in lighting, industry, and insulation.

Uses of Argon

Argon’s inert nature makes it valuable in many applications where chemical reactivity would be a problem:

Inert atmosphere: Used in welding to shield the weld from oxygen and nitrogen. Argon also provides a protective environment when producing reactive metals such as titanium and magnesium.

Lighting: Common in incandescent, fluorescent, and low-energy light bulbs. In incandescent lamps, argon prevents the filament from corroding. In fluorescent tubes, an electric discharge through argon and mercury vapor produces ultraviolet light that excites the bulb’s phosphor coating.

Insulation: Double- and triple-glazed windows are often filled with argon gas. Its low thermal conductivity improves energy efficiency by reducing heat transfer.

Specialty uses: Argon is even used to inflate the tires of some luxury vehicles to reduce road noise and protect the rubber.

Natural Occurrence and Production of Argon

Argon makes up about 0.94% of Earth’s atmosphere, making it the third most common atmospheric gas after nitrogen and oxygen. It is produced naturally by the radioactive decay of potassium-40.

Commercially, argon is obtained by the fractional distillation of liquid air, which separates gases based on their boiling points.

History of Argon

1785: Henry Cavendish observed that a small fraction of air would not react in experiments, but the finding went unexplored.

1894: Lord Rayleigh and Sir William Ramsay officially discovered argon while studying discrepancies in nitrogen densities. Their work revealed an unreactive gas that, after spectral analysis, proved to be a new element.

Biological Role of Argon

Argon has no known biological function in humans, animals, or plants. It is chemically inert and considered non-toxic.