

16
S
Sulfur
32.06

Key Properties

Atomic Mass	32.06
Category	Nonmetals
State at 20°C	solid
Melting Point	115.21°C
Boiling Point	444.61°C
Density	2.07
Electron Config	[Ne] 3s23p4
Electronegativity	2.58
Year Discovered	Ancient
Discovered By	Unknown

Did You Know?

- 1 It is mentioned in the Bible and ancient texts as \
- 2 The characteristic smell of rotten eggs is not from sulfur itself, but from hydrogen sulfide (H₂S), a compound of sulfur and hydrogen.
- 3 Sulfur is responsible for the distinctive smells of many other things, including garlic, onions, and skunk spray.
- 4 The process of vulcanization, which makes rubber more durable, involves heating it with sulfur.
- 5 Jupiter's moon Io is the most volcanically active body in the solar system, and its surface is covered in colorful sulfur compounds.

APPEARANCE

A bright yellow, brittle, crystalline solid.

SUPERHERO PERSONA

"The Brimstone Brawler, a hero with a distinctive smell, known since ancient times and a key part of gunpowder."

EVERYDAY CONNECTION

The head of a matchstick.

POP CULTURE

Often associated with volcanic planets and alien atmospheres in science fiction.

Sulfur: The Element of Volcanoes and Industry

Sulfur is a bright yellow, non-metallic element that often appears as crystals or powder. It has been known since ancient times, especially in volcanic regions, and has played an important role in both history and modern industry.

Why Is Sulfur Useful?

Sulfur's versatility comes from its many compounds, which are used in countless industries:

Sulfuric Acid: Most sulfur is used to make sulfuric acid (H₂SO₄), the world's most widely produced chemical. It's essential for making phosphates used in fertilizers.

Rubber Production: Sulfur is key in the vulcanization of rubber, a process that makes rubber stronger, more elastic, and more durable.

Mercaptans, sulfur compounds with a strong smell, are added to natural gas so leaks can be detected.

Sulfates are used in detergents.

Calcium sulfate (gypsum) is used in cement and plaster.

Historical Uses: Sulfur was once a key ingredient in black gunpowder and was used as a fumigant and fungicide.

Biological Role

Sulfur is essential for life. Plants and algae absorb sulfates from the soil and use them to build two of the amino acids needed to make proteins.

The human body contains about 140 grams of sulfur, mostly in proteins like keratin (in hair and nails). Pure sulfur is non-toxic, but some sulfur compounds—like hydrogen sulfide (rotten egg smell) and sulfur dioxide—are highly toxic.

⚠️ Burning fossil fuels that contain sulfur releases sulfur dioxide into the atmosphere, which causes acid rain, damaging lakes, rivers, and ecosystems.

Natural Abundance & History

Sulfur occurs naturally in its pure form (especially around volcanoes) and in many minerals. Today, most sulfur is obtained as a by-product of refining natural gas, oil, and tar sands.

Ancient Uses: Sulfur has been known for thousands of years. It's mentioned in the Bible (15 times), used by the Greeks for fumigation, and by many cultures for bleaching cloth. Alchemists once believed sulfur was a basic component of all metals.

1809 – Official Recognition: French chemists Louis-Joseph Gay-Lussac and Louis-Jacques Thénard showed sulfur was a unique element, a result later confirmed by Humphry Davy.