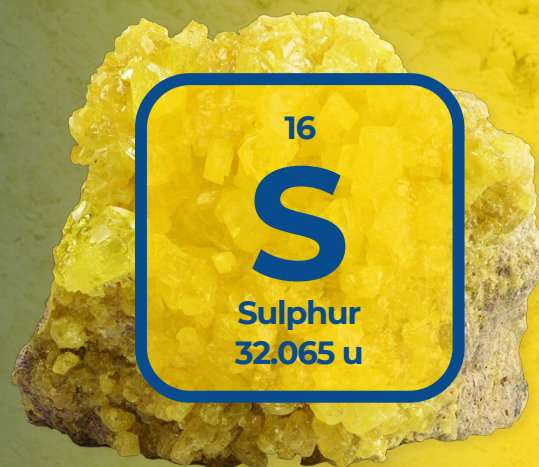


# Sulphur Fact Sheet



## An Introduction to Sulphur

- Sulphur is a non-metallic chemical element identified by the letter S.
- 85 million tonnes of sulphur in all forms are produced annually around the globe.
- Approximately 97% of elemental sulphur is produced worldwide from natural gas processing and oil refining. As a result, sulphur production is mainly concentrated in areas with significant sour gas processing and/or oil refining capacity, including North America, throughout Asia, the Middle East, and the former Soviet Union region. Approximately 2% of the global sulphur supply is produced from Frasch mining with the remaining 1% in other forms.
- Without sulphur, our modern agricultural system would not be possible, nor would the affordable refining of economically critical metals like copper, nickel, and lithium, which are important today and are increasingly important for the energy transition. Since antiquity, sulphur has played an essential role in everyday life. It has been used to bleach linens, mix pigments, disinfect, fumigate, make gunpowder, and support wellness and agriculture in the form of Epsom salt.
- Sulphur occurs naturally in the environment in a variety of compounds and is the thirteenth most abundant element in the earth's crust.
- Over half of the world's annual elemental sulphur production is traded internationally

## Understanding The Chemical Properties of Sulphur

**S**  
**Sulphur**  
Atomic Number: 16  
Atomic Mass: 32.065 u

Periodic Table of the Elements © www.elementsdatabase.com

1																	2
3	4											5	6	7	8	9	10
11	12											13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
55	56	57-71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
87	88	89-103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
Fr	Ra		Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Uut	Fl	Uup	Lv	Uus	Uuo

■ hydrogen  
■ alkali metals  
■ alkali earth metals  
■ transition metals  
■ post-transition metals  
■ nonmetals  
■ noble gases  
■ halogens  
■ metalloids

### COMPOUNDS

Familiar compounds are sodium sulphite, hydrogen sulphide (a toxic gas that smells like rotten eggs) and sulphuric acid

### OXIDATION

The common oxides are sulphur dioxide (SO<sub>2</sub>) and sulphur trioxide (SO<sub>3</sub>), which when dissolved in water make sulphurous acid and sulphuric acid, respectively

### REACTIVITY

It is chemically reactive, especially upon heating, and combines with almost all the elements

*The correct spelling for the chemical element is "sulfur" in American English, while "sulphur" is the preferred spelling in British English.*

## Physical and Chemical Properties of Sulphur



### SOLID SULPHUR

#### Color

Pale Yellow (orthorhombic); orange (monoclinic)

#### Odor

Odorless – sulphur may smell like rotten eggs due to impurities of H<sub>2</sub>S (may produce faint SO<sub>2</sub> odor if oxidation occurs)

#### Melting Point

115.21 °C (orthorhombic sulphur) / 239 °F

#### Density

2.07 g/cm<sup>3</sup> (orthorhombic sulphur) / 2,070 kg/m<sup>3</sup>

#### Solubility in Water

Insoluble

#### Solubility in Solvents

Soluble in carbon disulfide, benzene, and toluene

#### Allotropic Forms

Exists in several allotropes (e.g., rhombic and monoclinic)

#### Heat Conductivity

Poor conductor

#### Electrical Conductivity

Non-conductive

#### Reactivity

Reacts with oxygen to form sulphur dioxide; reacts with metals to form sulfides. It acts as an oxidant

#### Viscosity

N/A

#### Flammability

Combustible in air, producing blue flame and sulphur dioxide gas

#### Oxidation States

Commonly -2, 0, +4, +6 in a variety of molecular species

#### Hardness

1.5 – 2.5 on Mohs' Scale; can be friable



### LIQUID SULPHUR

Reddish-brown to dark red as temperature increases

Odorless (may produce faint SO<sub>2</sub> odor if oxidation occurs)

#### Boiling Point

444.6 °C / 832.28 °F

255 °F / 123.89 °C is approximately 1,801 kg/m<sup>3</sup>

Insoluble

Soluble in similar solvents in small quantities

Liquid sulphur does not exhibit allotropes but varies in polymerization depending on temperature

Poor conductor (temperature-dependent)

Non-conductive

Reacts similarly to solid sulphur; increased reactivity at higher temperatures; reacts with hydrocarbons

Highly variable: low viscosity initially, increasing dramatically with polymerization (above ~160°C)

Combustible in air, producing blue flame and sulphur dioxide gas

Same as solid sulphur

N/A