



Indroduction

Sulfuric acid , chemical formula H_2SO_4 , is one of the most important and widely used industrial chemicals. It is a strong, colorless, oily liquid that is highly corrosive and has a wide range of

applications across various industries. Here's a detailed description of sulfuric acid



CAS No.	7664-93-9
FORMULA	H ₂ SO ₄
MOLECULAR WEIGHT	98.079 g/mol

CHEMICAL PROPERTIES

Sulfuric acid is a diprotic acid, meaning it can donate two protons (H⁺ ions) per molecule. Its chemical structure consists of two hydrogen atoms, one sulfur atom, and four oxygen atoms. The compound is highly soluble in water, and when dissolved, it dissociates into hydrogen ions (H⁺) and sulfate ions (SO₄²⁻).

STANDARD SPECIFICATION

Total acidity (as H ₂ SO ₄)	98.0 min
Residue on ignition	0.2
Iron as Fe	0.05
Chloride as Cl	0
Lead as Pb	0.01
Arsenic as As	0

PHYSICAL PROPERTIES

Color	It is a colorless liquid, which can further contribute to its deceptive nature.
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Density	Sulfuric acid is denser than water, with a density around 1.84 g/cm ³ .
Boiling Point	The boiling point of sulfuric acid is approximately 337 °C (639 °F).
Odor	Sulfuric acid has no distinct smell, which can make it particularly dangerous as its corrosive nature might not be immediately noticeable.
State	Sulfuric acid is typically a viscous, oily liquid at room temperature. It doesn't freeze at common atmospheric conditions but can become supercooled.

PRODUCTION

Sulfuric acid is primarily produced through the contact process, which involves the following steps:

Sulfur Combustion	Sulfur (usually obtained from natural sources) is burned to produce sulfur dioxide gas (SO ₂).
Sulfur Dioxide Conversion	Sulfur dioxide is then oxidized to sulfur trioxide (SO ₃) using a catalyst like vanadium(V) oxide or platinum
Sulfur Trioxide Dissolution	Sulfur trioxide is dissolved in concentrated sulfuric acid to produce oleum, which is a solution containing various concentrations of sulfur trioxide in sulfuric acid.
Dilution	Oleum is then diluted with water to produce the desired concentration of sulfuric acid.

USES

Sulfuric acid has numerous industrial applications, including:

Chemical Manufacturing	It's a crucial component in the production of fertilizers (like superphosphate), detergents, pigments, and dyes.
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Petroleum Industry	Sulfuric acid is used in refining crude oil and in the manufacturing of various petrochemical products.
Battery Production	Lead-acid batteries used in vehicles and uninterruptible power supplies require sulfuric acid as an electrolyte.
Metal Processing	It's used for pickling (cleaning) metal surfaces and in the manufacture of various metals.
Synthetic Fiber Production	Sulfuric acid is used in producing synthetic fibers like nylon and rayon.
Water Treatment	It's used for pH adjustment and wastewater treatment.
Safety Considerations	Sulfuric acid is used in refining crude oil and in the manufacturing of various petrochemical products.

In conclusion, sulfuric acid is a potent and versatile chemical with widespread applications in industry. Its importance in various sectors of the economy underscores its crucial role in modern industrial processes, although its handling requires careful attention to safety precautions.

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