



Indroduction

Nitric acid (HNO_3) is a highly corrosive and strong mineral acid with a wide range of applications in various industries. It is an important chemical compound with distinct properties and uses.



Here's an overview of nitric acid:



CAS No.	7697-37-2
Chemical	HNO ₃
Formula Mol. Wt.	63

STANDARD SPECIFICATION

Total Acidity A HNO ₃	59.0 % w/ w
Nitrous Acid As HNO ₂	100 ppm
Chl ori de A s Cl	20 ppm
S ul phat e as H ₂ S O ₄	20 ppm
Res idue on I gnit ion	250 ppm
F l ouri de as F	100.00 m ax
Ca and M g	50.00 m ax
Heavy Metals as Pv (Lead)	10.00 m ax
Arsenic as F	1 m ax
Col our	Wat er Whi t e

CHEMICAL PROPERTIES

Nitric acid is a strong monoprotic acid, meaning it can donate a single proton (H⁺ ion) per molecule. Its chemical structure consists of one nitrogen atom, three oxygen atoms, and a hydrogen atom. When dissolved in water, it dissociates into hydrogen ions (H⁺) and nitrate ions (NO₃⁻).

PHYSICAL PROPERTIES:

Density	Its density is approximately 1.42 g/cm ³ .
Boiling Point	Nitric acid has a boiling point of around 83 °C (181 °F).
State	Nitric acid is a colorless to yellowish liquid with a pungent and acrid odor.

PRODUCTION

Nitric acid is commonly produced through the Ostwald process, which involves several steps:

Ammonia Oxidation	Ammonia (NH ₃) is oxidized with air in the presence of a catalyst (platinum or rhodium gauze) to form nitrogen dioxide (NO ₂) gas and water vapor.
Absorption	Nitrogen dioxide gas is then dissolved in water to form nitric acid and nitrogen monoxide (NO) through a series of chemical reactions.
Nitrogen Monoxide Oxidation	Nitrogen monoxide (NO) is further oxidized with oxygen to form nitrogen dioxide (NO ₂), which is then recycled back into the absorption step.

USES

Nitric acid has several important applications across industries:

Fertilizer Production	It's a key component in the production of ammonium nitrate and other nitrogen-based fertilizers.
	Nitric

Explosives	acid is used in the manufacture of explosives like nitroglycerin and TNT.
Oxidizing Agent	It serves as a strong oxidizing agent in various chemical processes and laboratory procedures.
Metallurgy	Nitric acid is used for etching and passivating stainless steel and other metals.
Dye and Pigment Production	It's used in the production of dyes, pigments, and inks.
Pharmaceuticals	Nitric acid is used in the synthesis of pharmaceutical intermediates and other compounds.
Electronics Industry	It's used for cleaning and etching semiconductor materials and electronic components.
Rocket Fuel	Nitric acid is used as an oxidizer in certain liquid rocket propellants.
Safety Considerations	Nitric acid is highly corrosive and poses significant health and safety risks. Direct contact with skin, eyes, or mucous membranes can cause severe burns. Inhalation of its vapors can lead to respiratory irritation and other health issues. It's important to handle nitric acid with proper protective equipment, ventilation,

and safety precautions.

In conclusion, nitric acid is a versatile and powerful chemical with a wide range of applications in various industries. Its corrosive nature and potential hazards underscore the importance of proper handling and adherence to safety guidelines when working with this chemical.