Prithvi Dye Chem

No: 1, 20th Cross, Rangaswamy Temple Street, Bangalore 560053

Ph: 080-41223338, M: +91-9341931213, Email: info@prithvidyechem.com, Web:www.prithvidyechem.com

HYDROFLUORIC ACID

PRODUCT IDENTIFICATION	
CAS NO.	7664-39-3
EINECS NO.	231-634-8
FORMULA	HF
MOL WT.	20.01
H.S.CODE	2811.11
TOXICITY	
SYNONYMS	Hydrogen Fluoride; Etching Acid; AHF; Fluorohydric Acid; Fluoric acid; HF Acid; Acide Fluorhydrique (French); Acido Fluoridrico (Italian); Fluorowodor (Polish); Fluorwasserstoff (German); Fluorwaterstof (Dutch);
RAW MATERIALS CLASSIFICATION	

PHYSICAL AND CHEMICAL PROPERTIES (ANHYDROUS)	
PHYSICAL STATE	Clear, colorless, corrosive fuming liquid
MELTING POINT	-84 C
BOILING POINT	19.5 C
SPECIFIC GRAVITY	0.97
SOLUBILITY IN WATER	miscible
pH	
VAPOR DENSITY	2.21
AUTOIGNITION	
NFPA RATINGS	Health: 4 ; Flammability: 0; Reactivity: 1
REFRACTIVE INDEX	
FLASH POINT	not flammable
STABILITY	Stable under ordinary conditions

GENERAL DESCRIPTION & APPLICATIONS

Hydrofluoric acid is the aqueous solution of hydrogen fluoride which is gas at room temperature (boiling point: 19 C). The pure hydrogen fluoride is a strong acid, it reacts violently with bases and is corrosive. It reacts violently with metals, glass, some forms of plastic, rubber, and coatings. HF exists in complex of H_6F_6, due to hydrogen binding. The aqueous solution of hydrogen fluoride

(hydrofluoric acid) is a weak acid as the high strength of hydrogen-fluorine bonds does not allow complete are dissociation with water. It is a highly corrosive, fuming, and Hazardous substance that liquid and vapor can cause severe burns. HF is prepared from the reaction of concentrated sulfuric acid on fluospar (a mineral composed of calcium fluoride, CaF_2).

Hydrofluoric acid is used as the catalyst of refinery alkylation. The term alkylation in petroleum refinery field is for the reaction of low olefins (typically butene) anf isoparaffins (typically isobutane) to form higher isoparaffins. Hydrofluoric acid is capable of dissolving inorganic oxides including glass (SiO_2), which offers following applications:

- Purification of aluminium and uranium
- Etching, cleaning, and frosting in the manufacture of glass
- Quartz purification
- Chemical milling titanium
- Rust removal in laundry products
- Removing surface oxides from silicon in the semiconductor industry
- Cleaning porcelain prosthetics
- Electroplating
- Removing oxide rust from stainless steel and titanium in the process called pickling.
- Hydrofluoric acid is also used as a feedstock of chemical synthesis for target molecules including fluorine organic compounds, teflon, and freon.

SALES SPECIFICATION	
70% AQUEOUS HF	
ASSAY (as HF)	70.0 - 72.0%
NONVOLATILE ACIDITY	200ppm max
SULFUR DIOXIDE	100ppm max
ARSENIC	20ppm max
46% AQUEOUS HF	
ASSAY (as HF)	46.0 - 49.0%
NONVOLATILE ACIDITY	500ppm max
SULFUR DIOXIDE	100ppm max
ARSENIC	20ppm max
TRANSPORTATION	
PACKING	Iso-tank, 200kgs in drum
HAZARD CLASS	8
UN NO.	1052

GENERAL DESCRIPTION OF FLUORINE AND ITS COMPOUNDS

Fluorine (Symbol : F; Atomic no. 9) is a yellowish, poisonous, corrosive gas under ordinary conditions. Fluorine becomes a yellow liquid upon cooling. It is the most reactive nonmetallic element and extremely powerful oxidizing agent. Because of its extreme reactivity, fluorine does not occur uncombined in nature. Fluorine occurs widely combined in the mineral fluorspar(fluorite, the chief commercial source), cryolite and apatite. The preparation of the free element is carried out by the electrolysis of a molten mixture of hydrogen fluoride, HF, and potassium fluoride, KF in the absence of water. Fluorine can be safely stored under pressure in cylinders of stainless steel if the valves of the cylinders are free from traces of organic matter. The outstanding oxidizing properties of the elemental gas are used in some rocket fuels. The element may be used for the fluorination of organic compounds with appropriate precautions. The element is used for manufacturing various fluorides including chlorine trifluoride and cobalt(III) fluoride which are important fluorinating agents for organic compounds, sulfur(VI) fluoride used as a gaseous electrical insulator. Boron trifluoride and antimony trifluoride like hydrogen fluorides are important catalysts for alkylation reactions used

to prepare organic compounds. Sodium fluoride (NaF) is used to treat dental caries and is often used for the fluoridation of drinking water to reduce tooth decay (However, there are reports of an accompanying risk of fluoride toxicity). The element is also used for the preparation of uranium(VI) fluoride, utilized in the gaseous diffusion process of separating uranium-235 from uranium-238 (natural uranium) for reactor fuel. The importance of fluorine lies largely in its extreme ability to attract electrons and to the small size of its atoms, which can be attributed to form many stable complexes with positive ions like hexafluorosilicate(IV) and hexafluoroaluminate(III). Fluorine derivatives of hydrocarbons (compounds of carbon and hydrogen) are useful extensively as aerosol-spray propellants, refrigerants, solvents, cleansing agents for electrical and electronic components, and foaming agents in shipping-plastics manufacturing. Useful plastics with non-sticking qualities, such as polytetrafluoroethylene (known by the trade name Teflon), are readily made from unsaturated fluorocarbons. A solution of hydrogen fluoride gas in water is called hydrofluoric acid, largely consumed for cleaning metals and for polishing, frosting, and etching glass. Hydrofluoric acid is also used as a catalyst for alkylation reactions. The chemical reactions are similar to those in the sulfuric acid process, but it is possible to avoid refrigeration. (In sulfuric acid alkylation, refrigeration is necessary because of the heat generated by the reaction).