BUSS ChemTech

FLUORINE TECHNOLOGY

HIGH BULK DENSITY ALUMINIUM FLUORIDE (FROM FLUORSPAR)

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BUSS ChemTech is recognized as the world leading technology supplier for fluorine chemicals.

Our process technology for fluorine chemicals is the result of over fifty years of continuous development linked to direct experience of the design and construction of industrial scale plants.

Aluminum fluoride is used by aluminum producers to lower the melting point of electrolytes in the smelting process and increase production efficiency.

AlF_3 Plant: Capacity 60,000 mpty, UAE

OUR EXPERIENCE ALLOWS US TO OFFER PLANTS WITH FULL OPERATING GUARANTEES.

THIS RESULTS IN

- Plant capacities and products specifications tailored to your requirements
- Critical equipment like the AlF_3 Reactor manufactured to strictly controlled specifications
- Prolonged plant life and high productivity

RANGE OF SERVICES

- Fluorspar reactivity tests
- Conceptual design
- Feasibility studies and plant assessments
- Basic and detail engineering
- Process automation
- Materials or total plant supply
- Project management,
- Commissioning and start-up
- After sales service

AHF Storage, Brazil

AlF_3 Plant: Capacity 60,000 mtpy, UAE

FLUORSPAR AND ALUMINIUM HYDROXIDE DRYING PLANTS

Fluorspar and aluminium hydroxide are delivered to the plant complex as a wet cake. Drying is carried out in flash dryers before transport to the respective user.

AHF SAFETY STORAGE

The storage system consists of AHF Storage Tanks within the AHF Storage Containment Tank at a low temperature and atmospheric pressure.

AHF PLANT

Hydrogen fluoride is produced by the reaction of sulphuric acid with fluorspar in the Prereactor and this reaction is completed in an indirectly heated rotary kiln.

The reaction can be represented by the following equation:

$CaF_2 + H_2SO_4 \rightarrow CaSO_4 + 2HF$

Dry fluorspar, oleum and sulphuric acid flow to the Prereactor where the reaction begins and is completed in a rotary kiln.

Hydrogen fluoride flows through gas cleaning equipment, is condensed and distilled to produce anhydrous hydrofluoric acid.

Solid calcium sulphate residues are removed from the HF Reactor, neutralised and is sold to the building industry for use as floor levelling material, building blocks and as retarder in the cement industry.

Tail gases flow to the central absorption section before emission to atmosphere.

ALF_3 PLANT

Aluminium fluoride is produced by reacting dried aluminium hydroxide with the hydrofluoric acid gas in a fluidized bed reactor.

The reaction can be summarized as follows:

$Al(OH)_3 + 3\ HF \rightarrow AlF_3 + 3\ H_2O$

$Al(OH)_3$ is conveyed to the $Al(OH)_3$ Silo from where it is fed into the AlF_3 Reactor.

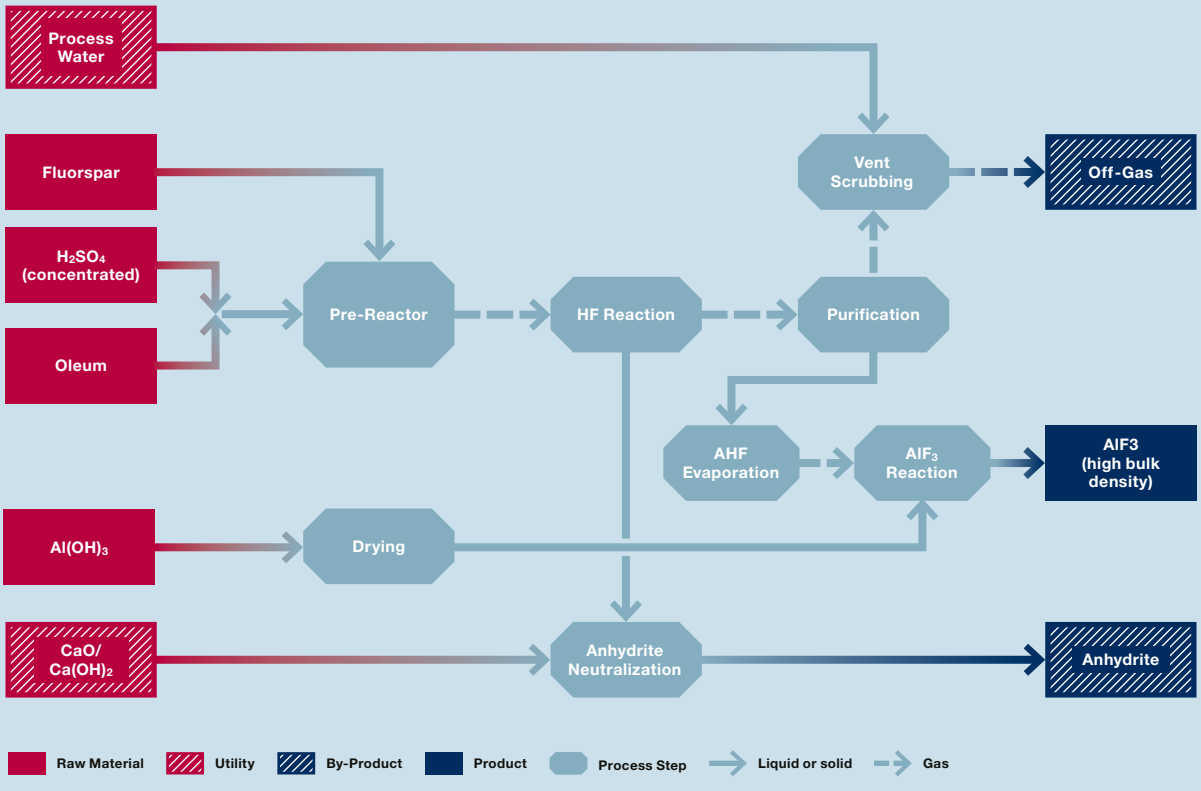
AHF is evaporated and superheated and fed to the lower bed of the reactor.

Aluminium fluoride is fed from the lower bed of the reactor through a product cooler to storage.

Fine solids transported out of the AlF_3 Reactor with the gas stream are recovered in cyclones and solids from them flow to the product stream.

Tail gases from the process flow to the central absorption section.

Aluminium fluoride product is fed to bulk transport tankers or bag filling plant.



KEY FEATURES

- High quality aluminium fluoride
- Reliability in operation
- Environment and high safety record
- Use of fluorspar containing high impurity levels
- Sale of anhydrite as building raw material
- white free-flowing solid
- Bulk Density 1,500 kg/m^3
- Flowability Index < 60 seconds for 1 kg
- L.O.I. (one hour at 550°C) max. 0.5 wt-%
- Granular size < 45 µm max. 10 %
- Granular size > 150 µm max. 3 %

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EXPECTED CONSUMPTION FIGURES

RAW MATERIALS[1]	
Fluorspar	1,540 kg
Sulphuric acid/oleum (calculated as 100 % H_2SO_4)	1,850 kg
Aluminium hydroxide (calculated as 100 wt-% $Al(OH)_3$	1,030 kg
Calcium hydroxide	30 kg

UTILITIES FOR THE COMBINED AHF/AlF_3 PLANT[1]	
Steam, Low Pressure	0.8 GJ
Steam, Medium Pressure	1.3 GJ
Process water	3 m^3
Cooling water	3.6 GJ
Chilled water	1.7 GJ
Electricity	215 kWh
Fuel	4.9 GJ

EXPECTED PRODUCT SPECIFICATION		
AlF_3	min.	91.000 wt-%
SO_4	max.	0.004 wt-%
SiO_2	max.	0.025 wt-%
P_2O_5	max.	0.005 wt-%
Fe_2O_3	max.	0.020 wt-%
Na_2O	max.	0.050 wt-%

[1] Values are per metric ton of aluminum fluoride produced.

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