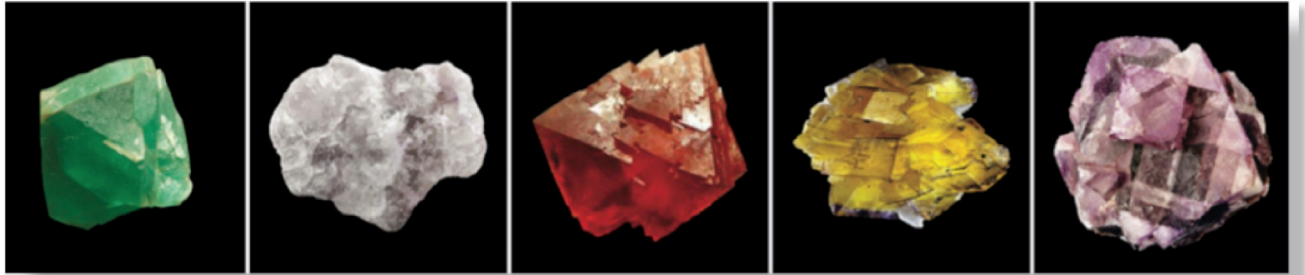


ITSM



Investment Opportunity

ITSM Mining

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ITSM Goal

Fluorspar is an essential raw material in the basic chemical, steel and aluminium industries and in a growing number of high tech green technologies and pharmaceutical applications.

Fluorspar has a growing economic and strategic importance; defined as a strategic mineral in the US with 100% net import reliance; identified by the European Commission as a critical raw material facing a supply shortage.

Add value to the Group's mineral projects through the discovery and development of mineral resources and to become a reliable long term and competitive supplier of high quality fluorspar to world markets.

Acquire and develop large fluorspar deposits located close to established infrastructure and key markets in stable, democratic and mining friendly jurisdictions.

What is Fluorspar

Fluorite (also called fluorspar) is the mineral form of calcium fluoride, CaF_2 . It belongs to the halide minerals. It crystallizes in isometric cubic habit, although octahedral and more complex isometric forms are not uncommon.

The Mohs scale of mineral hardness, based on scratch hardness comparison, defines value 4 as Fluorite.

Pure fluorite is transparent, both in visible and ultraviolet light, but impurities usually make it a colorful mineral and the stone has ornamental and lapidary uses. Industrially, fluorite is used as a flux for smelting, and in the production of certain glasses and enamels. The purest grades of fluorite are a source of fluoride for hydrofluoric acid manufacture, which is the intermediate source of most fluorine containing fine chemicals. Optically clear transparent fluorite lenses have low dispersion, so lenses made from it exhibit less chromatic aberration, making them valuable in microscopes and telescopes. Fluorite optics are also usable in the far ultraviolet and midinfrared ranges, where conventional glasses are too absorbent for use.

History and Etymology

The word fluorite is derived from the Latin verb *fluere*, meaning to flow. The mineral is used as a flux in iron smelting to decrease the viscosity of slags. The term flux comes from the Latin adjective *fluxus*, meaning flowing, loose, slack. The mineral fluorite was originally termed *fluorospar* and was first discussed in print in a 1530 work *Bermannvs sive de re metallica dialogus* [Bermannus; or a dialogue about the nature of metals], by Georgius Agricola, as a mineral noted for its usefulness as a flux. Agricola, a German scientist with expertise in philology, mining, and metallurgy, named *fluorspar* as a neoLatinization of the German *Flussspat* from *Fluß* (stream, river) and *Spat* (meaning a nonmetallic mineral akin to gypsum, *spærstān*, spear stone, referring to its crystalline projections).

In 1852, fluorite gave its name to the phenomenon of fluorescence, which is prominent in fluorites from certain locations, due to certain impurities in the crystal. Fluorite also gave the name to its constitutive element fluorine. Presently, the word “fluorspar” is most commonly used for fluorite as the industrial and chemical commodity, while “fluorite” is used mineralogically and in most other senses.

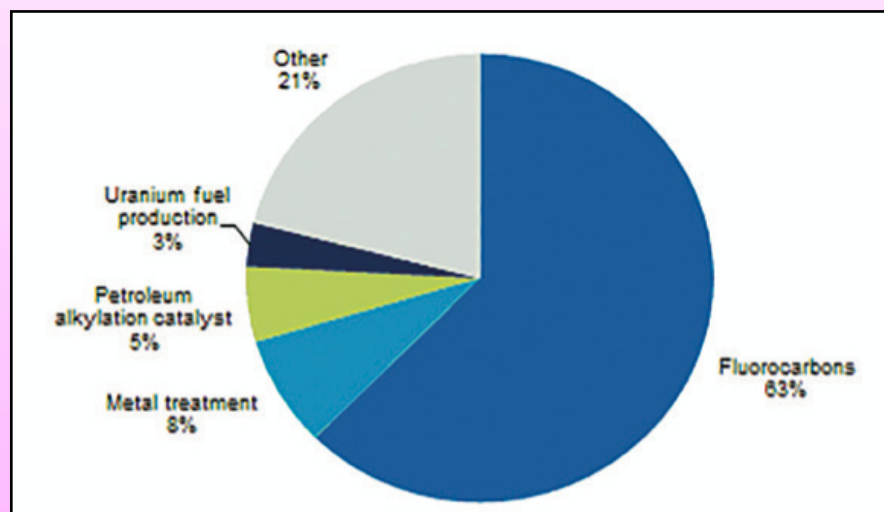
How large is the Fluospar industry

Transparency Market Research's report based on the global fluorspar market estimated to expand at a Compound Annual Growth Rate of 2.7% by the forecast period from 2017 to 2025. With this steady Compound Annual Growth Rate, the market is expected to attain a value of US\$1,860.8 Mn by 2025 from a value of US\$1,505.3 Mn in 2016.

Based on the product, in 2016, the acidspar segment held the lion's share of more than 60% and is estimated to remain dominant in the forecast period. Based on the application, the hydrofluoric acid segment accounted for a 40% share of the demand in the global fluorspar market in 2016. Based on the region, the Asia Pacific accounted for the maximum share in the fluorspar market and is expected to be the dominant region by expanding at a Compound Annual Growth Rate of 2.9% over the forecast period.

The global fluorspar market has gained traction due to a booming automotive sector. Fluorspar has applications across the production of hydrofluoric acid as a key component. The hydrofluoric acid plays a key role in the purification of aluminum. Additionally, growing usage of aluminum across numerous industries such as mechanical and automotive industries is boosting its manufacturing process. This is a key factor driving the growth of the global fluorspar market.

Rising adoption of the automobile and luxurious vehicles globally and mainly across the developing countries due to increasing expenditure power is stimulating growth of the global fluorspar market. Furthermore, rapid industrialization in developing countries is leading to the expansion of the foundries and metal manufacturing. This trend is likely to continue in the coming years due to the rising investment of the companies in the sector. This is likely to encourage consumption of the fluorspars, which in turn, fuel market's growth in the forthcoming years.



Where is Fluospar currently produce

The term “fluorspar” refers to crude or beneficiated material that is mined and/or milled for the mineral fluorite (calcium fluoride). Fluorite is a nonmetallic mineral, containing 51.1 percent calcium and 48.9 percent fluorine. Industry practice has established three grades of fluorspar: acid grade (containing more than 97 percent calcium fluoride), ceramic grade (85 to 95 percent calcium fluoride) and metallurgical grade (normally 60 to 85 percent calcium fluoride). Fluorspar’s uses have grown and changed in the last 100 years; today, the most important markets are fluorochemical production, aluminum refining and steelmaking.

In the U.S., most acidgrade fluorspar is used in the production of hydrofluoric acid, which is primarily used in manufacturing various fluorocarbon chemicals that are used as refrigerants, foam blowing agents and solvents, and in the production of high performance plastics. Hydrofluoric acid also is used in manufacturing computer chips and high octane gasoline, stainless steel pickling and uranium fuel processing. Acid or ceramic grade fluorspar also may be used to manufacture enamels, glass and fiberglass, and welding rod coatings. Metallurgical grade fluorspar is consumed mainly in steelmaking, but is also used in making portland cement and casting iron and steel.

Popular Towns, Cities, Etc. in Hardin County, Illinois

	County	State	Total Mines	Prospects	Occurrences	Plants	Producers
Elizabethtown	Hardin	Illinois	120	17	15	4	84
Rosidare	Hardin	Illinis	120	17	15	4	84
Cave-In-Rock	Hardin	Illinois	115	15	14	4	82

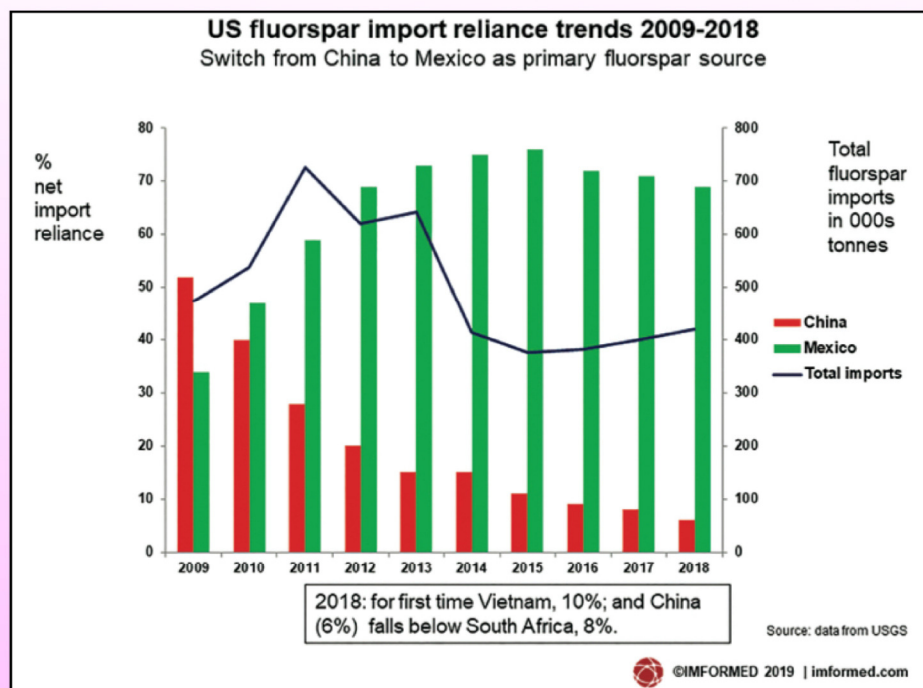
Popular Public Lands & Regions in Hardin County, Illinois

	Land Type	Total Mines	Prospects	Occurrences	Plants	Producers
Shawnee National Forest	National Forests	35	3	7	1	24

Top Mining Districts in Hardin County, Illinois

	State	Total Mines	Prospects	Occurrences	Plants	Prospects
Cave-In-Rock Mini District	Illinois	18	2	2	0	14
Illinois-Kentucky Fluorspar Mining District	Illinois	16	1	5	0	10
Rosiclare Mining District	Illinois	14	0	0	2	12

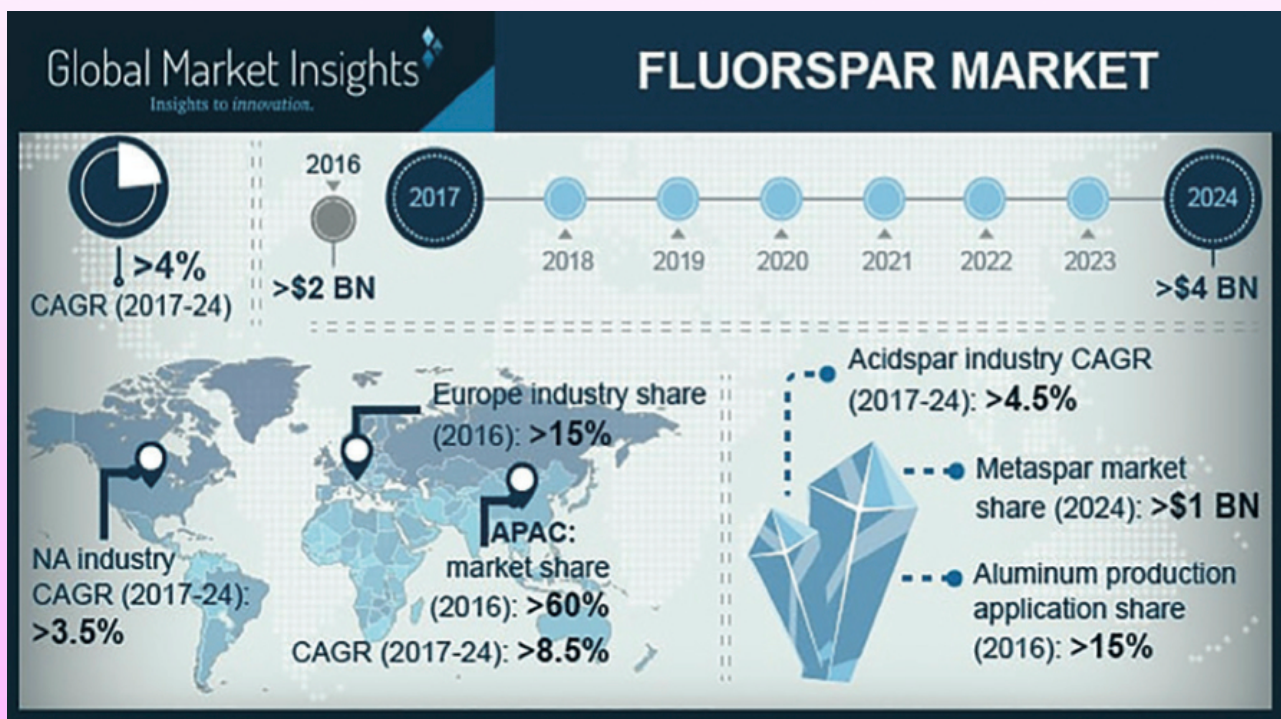
Fluorite is allochromatic, meaning that it can be tinted with elemental impurities. Fluorite comes in a wide range of colors and has consequently been dubbed “the most colorful mineral in the world”. Every color of the rainbow in various shades are represented by fluorite samples, along with white, black, and clear crystals. The most common colors are purple, blue, green, yellow, or colorless. Less common are pink, red, white, brown, and black. Color zoning or banding is commonly present. The color of the fluorite is determined by factors including impurities, exposure to radiation, and the absence or voids of the color centers.



Fluorspar Market by Global Market Insights

Uses: The majority of the United States' annual consumption of fluorspar is for the production of hydrofluoric acid (HF) and aluminum fluoride (AlF₃). HF is a key ingredient for the production of all organic and non organic chemicals that contain the element fluorine. It is also used in the manufacture of uranium. AlF₃ is used in the production of aluminum.

The remainder of fluorspar consumption is as a flux in making steel, glass, enamel, and other products. A flux is a substance that lowers the melting temperature of a material.



Fluorine

atomic number

9

18.998

atomic weight

symbol

F

electron configuration

[He]2s²2p⁵

physical state at 20 °C (68 °F)

name

fluorine



Halogens

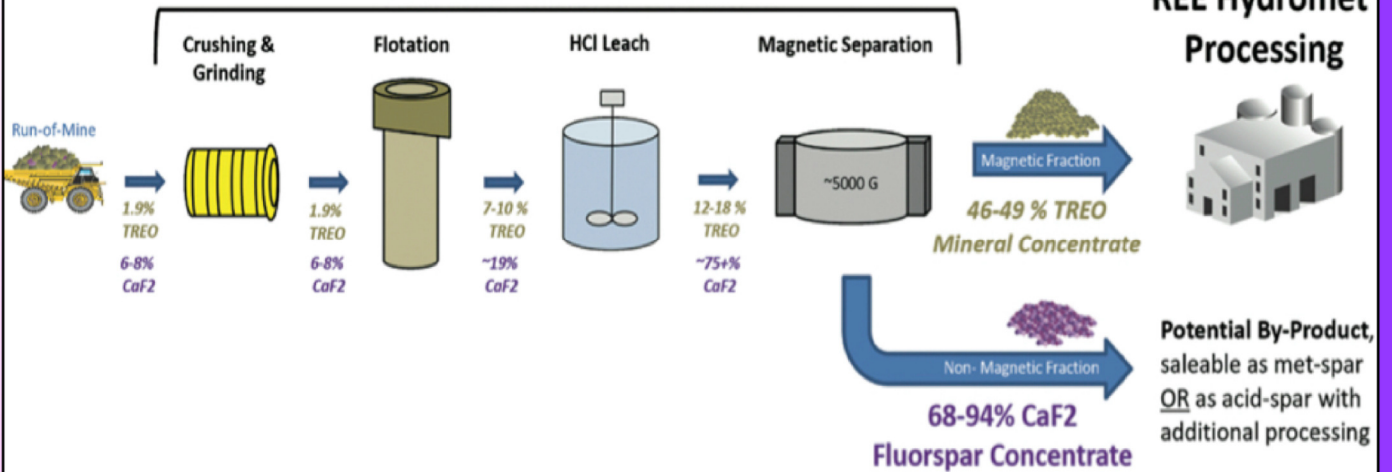


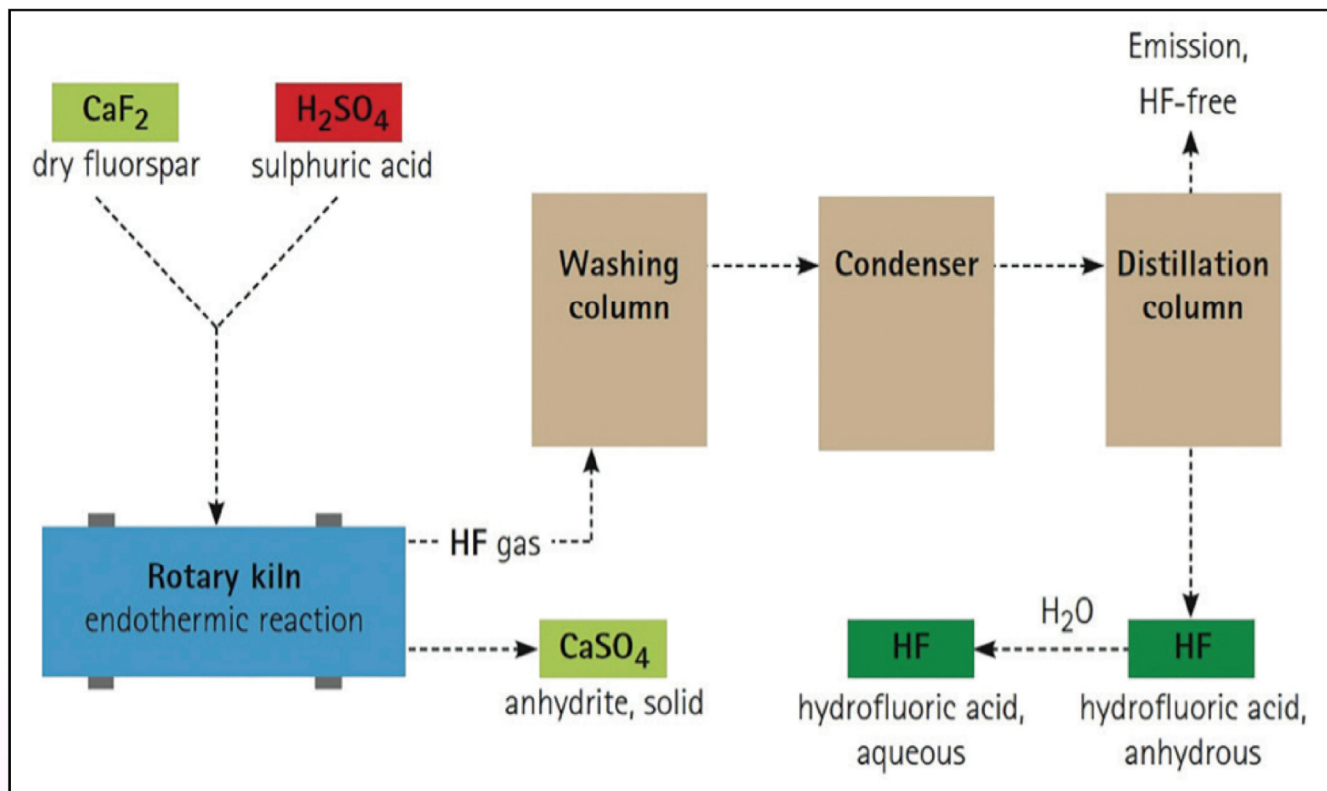
Gas

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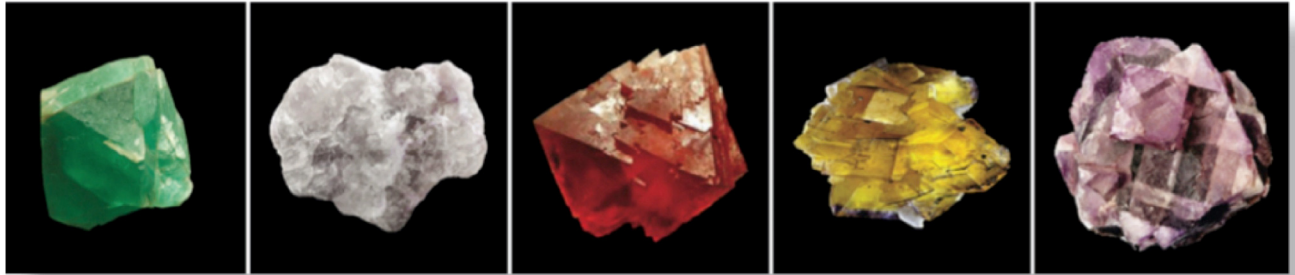
Beneficiation Process

REE Hydromet Processing





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Thank You

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