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FLUORITE

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GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

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12 Fluorite

Fluorite is a very popular mineral, and it naturally occurs in all colours of the spectrum. It is one of the most varied coloured mineral in the mineral kingdom, and the colours may be very intense and most electric. Pure fluorite is colourless and the colour variations are caused by various impurities. It is a mineral with veritable bouquet of brilliant colours from hallmark colour purple to blue, green, yellow, colourless, brown, pink, black and reddish orange. The rich purple colour is by far the most famous and popular colour. It is an important commercial source of fluorine.Fluorite plays a vital role in the manufacturing Industry and major consuming industries are chemical, cement, iron & steel, electrode, etc. It is also used in the production of synthetic cryolite without which aluminium extraction is not possible.

Fluorite is commonly deposited by hydrothermal solution sourced from igneous intrusions. The mineralisation occurs as veins or replacement deposits either by the filling of cavities and fissures or by the replacement of the host rock, typically carbonates.

Mainly two grades of fluorite are involved in consumption and trade, namely, the Acid grade (acidspar) containing more than 97% CaF_2 and the Sub-acid grade analysing 97% or less CaF_2. The Sub-acid grade includes Metallurgical (60 to 85% CaF_2) and Ceramic (85 to 95% CaF_2) grades and is commonly known as Metallurgical grade (metspar). Fluorite production in the country is meagre when compared with the world production.

In addition to the natural fluorite production, synthetic fluorite is recovered as by-product during uranium processing, petroleum alkylation and stainless pickling. The by-product, fluorosilicic acid, obtained from phosphoric acid plants while processing phosphate rock also supplements fluorite as a source of fluorine.

RESERVES/RESOURCES

As per NMI database, based on the UNFC system, the total reserves/resources of fluorite in the country as on 1.4.2015 has been estimated at 18.18 million tonnes. Out of these, 0.29 million tonnes are placed under Reserves category (of which 0.22 million tonnes are under Proved category and 0.06 million tonnes under Probable category). The Remaining Resources comprise 17.89 million tonnes.

By States, Gujarat accounts for 66% of the total reserves/resources having 12 million tonnes, followed by Rajasthan with 5.24 million tonnes (29%), Chhattisgarh 0.55 million tonnes (3%) and Maharashtra 0.39 million tonnes (2%). Gradewise, the resources are classified into Marketable grade which accounted for 81% of the total resources followed by low grade (17%) and Unclassified grade (2%) (Table-1).

EXPLORATION & DEVELOPMENT

The exploration and development details, if any, are covered in the Review on Exploration & Development under "General Reviews".

PRODUCTION & STOCKS

The production of fluorite (graded) at 1,315 tonnes in 2019-20 increased substantially by 22% as compared to the previous year.

There was only one reporting mine in both the years 2018-19 as well as in 2019-20. The entire output was reported from one Public Sector mine which is located in district Chandrapur of Maharashtra owned by Maharashtra State Mining Corporation Ltd. The mine-head closing stocks of fluorite (graded) was 97,750 tonnes in 2019-20 as against 97,597 tonnes in 2018-19 (Tables-2 to 5).

The average daily labour employed in fluorite mines in 2019-20 was 40 as against 44 in the previous year.

The domestic price of fluorite is furnished in the General Review on 'Prices'.

Table – 1 : Reserves/Resources of Fluorite as on 1.4.2015
(By Grades/States)

(In tonnes)

Grade / State	Reserves				Remaining Resources								Total Resources (A+B)
	Proved STD111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)	
		STD121	STD122			STD221	STD222						
All India : Total	**224824**	**63860**	**-**	**288684**	**4976749**	**745390**	**571311**	**1713833**	**6218421**	**3522537**	**145183**	**17893423**	**18182107**
By Grades													
Marketable	224824	63860	-	288684	4976749	586080	406111	-	5757010	2497534	145183	14368666	14657350
Low	-	-	-	-	-	3790	9680	1710348	445660	1000003	-	3169481	3169481
Unclassified	-	-	-	-	-	155520	155520	3485	15751	25000	-	355276	355276
By States													
Chhattisgarh	-	-	-	-	65889	153132	9288	185485	5573	126088	-	545455	545455
Gujarat	-	-	-	-	4279230	-	-	-	5723360	2001920	-	12004510	12004510
Maharashtra	224824	63860	-	288684	-	-	-	-	-	100000	-	100000	388684
Rajasthan	-	-	-	-	631630	592258	562023	1528348	489488	1294529	145183	5243458	5243458

Figures rounded off

Table – 2 : Producer of Fluorite (Graded), 2019-20

Name and address of producer	Location of mine	
	State	District
Maharashtra State Mining Corporation Ltd, Plot No. 7, Ajni Square, Wardha Road, Nagpur-440 015, Maharashtra.	Maharashtra	Chandrapur

Table – 3 : Production of Fluorite (Graded), 2017-18 to 2019-20 (By States)

(Qty in tonnes;Value in ₹'000)

State	2017-18		2018-19		2019-20 (P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	**1314**	**8646**	**1079**	**8117**	**1315**	**8769**
Maharashtra	1314	8646	1079	8117	1315	8769

Table – 4 : Production of Fluorite (Graded), 2018-19 & 2019-20 (By Sector/States/Districts)

(Qty in tonnes; Value in ₹'000)

State/District	2018-19			2019-20 (P)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India	**1**	**1079**	**8117**	**1**	**1315**	**8769**
Public Sector	1	1079	8117	1	1315	8769
Maharashtra	**1**	**1079**	**8117**	**1**	**1315**	**8769**
Chandrapur	1	1079	8117	1	1315	8769

Table – 5 : Mine-head Closing Stocks of Fluorite (Graded), 2018-19 & 2019-20 (By States)

(In tonnes)

State	2018-19	2019-20 (P)
India	**97597**	**97750**
Gujarat	83372	84372
Maharashtra	14225	13378

MINING

Maharashtra State Mining Corporation (MSMC) operates Dongargaon fluorite mines in District Chandrapur, Maharashtra. Mining is carried out by semi-mechanised opencast method. The run-of-mine is hand sorted for marketing of fluorite (graded).

BENEFICIATION

Fluorspar is beneficiated by hand sorting followed by gravity concentration methods, such as, heavy media, jigs and tables in order to separate calcite and silicate mineral impurities. Low-grade fluorite produced is used after beneficiation in the industries. GMDC has a beneficiation plant of 500 tpd capacity located at Kadipani to produce Acid grade (96% CaF_2) and Metallurgical grade (90% CaF_2) fluorite by upgrading the low-grade fluorspar ore from 23–25% CaF_2 by flotation method. Besides, it has facility to produce MFC & MET grade powder analysing 75 to 85% CaF_2 & 85 to 92.5% CaF_2 respectively and other products, such as, starch briquettes (81% CaF_2 min.) and silicate briquettes (79% CaF_2min.). As per annual report of GMDC 2016-17, the Government of Gujarat has accorded approval for setting up beneficiation plant of 40,000 MTPA capacity at Kadipani, district Vadodara, in joint venture with Gujarat Fluoro Chemicals Ltd, Noida and Navin Fluorine International, Mumbai. Based on pilot test report, Global tender will be floated for selection of EPC contract. Valuation report for Kadipani assets has been received, on which basis, land will be leased to JV Company and asset transfer will be carried out in favour of JV Company.

CONSUMPTION

The apparent consumption of fluorite was about 3,24,704 tonnes in 2019-20, as against the 2,64,752 tonnes in 2018-19.

SPECIFICATIONS

BIS has prescribed IS: 8587-1993 (First Revision, reaffirmed 2011) for Acid grade fluorite for use in Chemical industries, and IS: 4574-1989 (Second Revision, reaffirmed 2008) for fluorite in Metallurgical industries.

USES

Acid grade fluorite is used as a feedstock in the manufacture of hydrofluoric acid (HF) and to produce aluminium fluoride (AlF_3). The major use of HF is for the production of a wide range of fluorocarbon chemicals, including hydrofluorocarbons (HFCs) hydrochlorofluorocarbons (HCFCs), and fluoropolymers. But, owing to environmental concerns, part of chlorofluorocarbons (CFCs) are replaced by HCFCs. HF is used in the manufacture of uranium tetrafluoride, an important ingredient used for producing nuclear fuel and fission explosives. It is also used in stainless pickling, petroleum alkylation, glass etching, oil & gas well treatment and as etcher/cleaner in Electronic Industry.

HF is used in the manufacture of a host of fluorine chemicals used in dielectrics, metallurgy, wood preservatives, herbicides, mouthwashes, decay-preventing dentifrices, plastics and water fluoridation.

AlF_3 manufactured from Acid grade fluorite is used as a flux in electrolytic recovery of aluminium. On an average, worldwide consumption of fluorides is about 21 kg for every tonne of aluminium produced. This ranged from 10 to 12 kg per tonne in a modern pre-baked aluminium smelter and about 40 kg in an old Soderberg smelter without scrubber.

Ceramic grade fluorite containing 85 to 95% CaF_2 is used in Ceramic Industry as a flux and as an opacifier in the production of flat glass, white or opal glass and enamels. The addition of 10–30% Ceramic grade fluorspar to glass makes it opaque, white and opalescent. It is also used in the manufacture of magnesium, some manganese chemicals and welding rod coating.

Metallurgical grade fluorite is used primarily as fluxing agent by Steel Industry. It is added to slag to make it more reactive through increased fluidity. Fluorite of different grades is used in the manufacture of aluminium, cement and glass fibres. It is also used in the melt shop by Foundry Industry.

INDUSTRY

Many fluorine-based chemicals like hydrofluoric acid, aluminium fluoride, cryolite, sodium silicofluoride and hydrofluorosilicic acid are produced by Chemical and Fertilizer industries in the country.

In addition to material produced indigenously, substantial quantity of high-grade fluorite was also imported to meet the demand of the fluorine-based Chemical Industries.

The Tanfac Industries Ltd is a Joint Sector Company of Tami Nadu Industrial Development Corporation (TIDCO) and Aditya Birla Group at Cuddalore, Tamil Nadu. It is engaged in the manufacture of fluorine chemicals, such as, aluminium fluoride, anhydrous hydrofluoric acid, sodium silicofluoride, ammonium bifluoride, potassium fluoride, and various other fluorine-based chemicals. The Company has an annual installed capacity of 15,600 tonnes each of aluminium fluoride and anhydrous hydrogen fluoride, 67,200 tonnes of sulphuric acid, 14,000 tonnes of hydrofluoric acid and 3,400 tonnes of speciality fluorides. The Company's topline had gone up by 19% in the year 2017-18 due to increased sales volume of HF, aluminium fluoride and sulphuric acid. Revival of IBAP plant by successfully reducing the cost of production through process optimisations and sucessfully developing and marketing value-added products out of by-products generated from the IBAP process.

Navin Fluorine Industries Ltd, Surat, Gujarat, has an installed capacity of about 22,000 tpy of hydrofluoric acid. The Company produces a number of fluorine chemicals, namely, hydrofluoric acid, cryolite, aluminium fluoride and various other organic and inorganic fluorine-based chemicals.

Apatite and rock phosphate containing 3 to 4% CaF_2 was another useful source for recovery of fluorine. Coimbatore Pioneer Fertilizer Ltd has reported production of sodium silicofluoride in the past. Similarly, hydrofluorosilicic acid was reportedly produced by Rashtriya Chemicals & Fertilizer Ltd, Mumbai, whereas Dharamsi Morarji Chemical Co. Ltd, Ambernath, Maharashtra no longer reported production of fluorine chemicals. Aluminium fluoride is produced by Southern Petrochemical Industries Corporation Ltd, Thoothukudi, Tamil Nadu, with an installed capacity of 2,560 tpy.

SUBSTITUTES

Olivine or dolomitic limestone can be used as substitute for fluorite in Iron & Steel industry. The by-product fluorosilicic acid from phosphoric acid production could also be used as a substitute in aluminium fluoride production.

ENVIRONMENT

Fluorine attracts environmental concern. Use of fluorine in drinking water has begun to wane. Fluorine is toxic in high concentration but beneficial in low concentration. Although fluorine has been under attack ever since its use in water in 1949, the only significant health problem with which it has been linked was 'Fluorosis', a disease that involves health defects and bone lesions. This problem is caused by concentration of fluoride that is much higher than the permissible levels in municipal water supplies. As per Indian Standards, the permissible limit of fluoride in the drinking water is 1.5 mg/l. "Defluoridisation by adsorption" is a common economical and efficient method for removal of excess fluoride from drinking water. Electrolytic precipitation based on use of aluminium salts and by electrochemical route, etc. are the other few methods used for defluoridisation.

Fluorine is at the centre of controversy over chlorofluorocarbons (CFCs), which causes depletion of atmospheric ozone layer that protects the earth from ultraviolet radiation, a major cause of skin cancer. The hydrofluorocarbon (HFC) and hydrochlorofluorocarbon (HCFC) compounds, which have been developed as an alternative to CFC, require more hydrofluoric acid than CFC and are expected to boost fluorite consumption. These greenhouse gases are being phased out in stages. It is reported that even if CFC emission is stopped, the present level of these gases may take up to ten years to reach the upper atmosphere where they could persist for a century or more.

According to United Nations Environment Programme (UNEP), an international agreement to curtail illegal trade in CFC and other ozone depleting chemicals came into effect on 10th November 1999. The agreement, which was authorised through an amendment to the Montreal Protocol in 1997, requires nations to create licensing system for international sales of ozone depleting chemicals. Further, as a part of the Montreal Protocol, 129 nations agreed on a three-year funding package to enable developing countries to continue their efforts to phase out CFC and other ozone depleting chemicals, and accordingly, the Fund's Executive Committee approved major agreements with China and India to finance the shutdown of CFC production facilities in the two countries during the next ten years.

The United Nations Environment Programme (UNEP) has prepared a Montreal Protocol Handbook that provides additional detail and explanation of the provisions. CIESIN's Thematic Guide on Ozone Depletion and Global Environmental Change presents an in-depth look at causes, human and environmental effects, and policy responses to stratospheric ozone depletion.

The use of the low global warming Potential (GWP) hydyrofluroolefins refrigerant HFO-1234 yf is suggested as a preferred replacement of HFC- 134a by both the U.S. Environmetal protection Agency and the EU. Daimler in Europe has opted for CO_2 based air conditioning refrigerant in its 2017 Mercedes E and S class cars.

WORLD REVIEW

The world total reserves of fluorite fluorspar were at 320 million tonnes. World reserves are concentrated mainly in Mexico (21%), China & South Africa (13% each), Mongolia (7%) and Spain (3%) (Table- 6).

World production of fluorite in 2019 increased marginally by 2% to 6.50 million tonnes as compared to 6.40 million tonnes in the previous year (Table-7).

China (62%), Mexico (19%), South Africa & Vietnam (4% each) and Mongolia (2%) were the principal producing countries of fluorite in 2019.

To provide generalised view of the development in various countries, the countrywise description as sourced from the latest available publication of Minerals Yearbook 'USGS 2017' is furnished below :

Canada

Canada Fluorspar Inc. (CFI)(St.Lawrence, Newfoundland and Labrador) continued development of its project in Newfoundland and Labrador Burin Peninsula. CFI's resources totalled 8.8 million tonnes of fluorspar from four vein deposits, including the AGS, Blue Beach North, Director and Tarefare veins, which together had an average grade of 39% CaF_2. The mine officially opened in August, and construction continued on the 2,00,000-metric-ton-per-year flotation mill. Ore from three open pits would be stockpiled until the mill is commissioned. First production of acid-grade concentrate was expected in early 2018.

Morocco

Groupe Managem (Casablanca) reported acid-grade concentrate production of 56,395 tonnes from the El Hammam Mine operated by Samine, a 15% decrease from that of 2016. In response to the decrease in Acid-grade concentrate production, the Company increased production of Metallurgical-grade fluorspar for use in the cement market by more than five times that of 2016.

South Africa

in July, 2016, SepFluor Ltd began construction on the Nokeng Mine and milling project in Rust de Winter, Gauteng Province. Nokeng is located in the Bushveld Complex directly south of the Minersa Group's Vergenoeg Mine, the country's only operational fluorspar mine. Open pits would be developed at two of three fluorspar-haematite deposits that make up the Nokeng Mine—the Outwash Fan, which has an average ore grade of 22.7% CaF_2, and Plattekop, which has an average ore grade of 38.2% CaF_2. A processing plant with a capacity of 1,80,000 t/yr of Acid-grade fluorspar and 30,000 t/yr of Metallurgical-grade fluorspar was designed to accommodate different types of ore. The estimated life of the mine was 19 years, and first production was expected in early 2019.

Vietnam

Nui Phao Mining Co. Ltd produced Acid-grade fluorspar as well as bismuth, copper, and tungsten concentrates from its Nui Phao polymetallic mine in Thai Nguyen Province in northern Vietnam. The Company had reported increased production of fluorspar each year since the mine went into operation in 2014. The production increases were attributed to the implementation of successive capital upgrades to increase ore throughput and enhance recovery rates, particularly in the tungsten and fluorspar processing circuits. Mill recovery rates of fluorspar increased to 57% in 2017 from 49% in 2016, which resulted in an 8% increase in fluorspar production.

Table – 6 : World Reserves of Fluorspar Fluorite (By Principal Countries)

(In '000 tonnes)

Country	Reserves#
World: Total (rounded)	**3,20,000**
Burma	NA
Canada	NA
China	42,000
Germany	NA
Iran	3,400
Mexico	68,000
Kazakhstan	NA
Mongolia	22,000
Morocco	210
Pakistan	NA
South Africa	41,000
Spain	10,000
USA	4,000
Vietnam	5000
Other countries	1,20,000

Source: *USGS, Mineral Commodity Summaries, 2021*
 # Measured as 100% calcium fluoride

Table – 7 : World Production of Fluorite (By Principal Countries)

(In tonnes)

Country	2017	2018	2019
World Total	**5600000**	**6400000**	**6500000**
China*	3700000	4000000	4000000
Mexico	741678	1182058	1231465
South Africa*	257000	242000	240000
Vietnam	234905	238702	238003
Mongolia	108900	101200	156100
Spain	154931	176188	144167
Morocco	75500	87874	100000*
Iran[(b)]	36511	89102	89000*
Kazakhstan	100000*	100000*	87800
Other countries	174000	167923	192306

Source : *BGS, World Mineral Production, 2015-19*

**) Estimated*

b) Year ended 20 March following that stated

FOREIGN TRADE

Exports

Exports of fluorite more than the doubled to 1,369 tonnes in 2019-20 from 534 tonnes in the previous year. Exports were mainly to China (36%), Indonesia (34%), Bhutan (4%), Brazil, Philippines, Republic of Korea & Bangladesh (3% each) and Nigeria, Qatar & Malaysia (2% each). Similarly, exports of aluminium fluoride witnessed three fold increase to 1,362 tonnes in 2019-20 as compared to 442 tonnes in the previous year. Exports were mainly to UAE (81%), Japan (10%) and South Africa (9%). Exports of hydrofluoric acid also increased substantially by 13% to 2,475 tonnes in 2019-20 as compared to 2,198 tonnes in the preceding year (Tables- 8 to 10).

Imports

Unlike exports, imports of fluorite decreased marginally by 10% to 2.40 lakh tonnes in 2019-20 as compared to 2.65 lakh tonnes in the previous year. Imports were mainly from South Africa (37%), China (34%), Thailand (15%), Morocco (4%) and Vietnam (3%). Imports of aluminium fluoride however, decreased substantially by 35% to 40,362 tonnes in 2019-20 from 62,374 tonnes in the previous year. Imports were mainly from China (49%), Jordan (15%), Italy (14%), Indonesia (11%), Mexico (6%) and Norway (4%). While imports of hydrofluoric acid more than doubled to 969 tonnes in 2019-20 from 391 tonnes in the preceding year. Imports were mainly from China (64%), Taiwan (28%) and Germany (8%) (Tables- 11 to 13).

Table – 8 : Exports of Fluorite (By Countries)

Country	2018-19 (R)		2019-20 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**534**	**23413**	**1369**	**51565**
Indonesia	106	5490	466	24719
China	++	1	494	10071
Brazil	49	3366	47	3334
Philippines	50	928	44	2155
Nigeria	18	950	30	1451
Korea, Rep. of	-	-	40	1302
Bhutan	41	920	55	1301
Bangladesh	57	2381	47	1237
Qatar	-	-	25	1173
Malaysia	-	-	21	979
Other countries	213	9376	100	3842

Figures rounded off

Table – 9 : Exports of Aluminium Fluoride (By Countries)

Country	2018-19 (R)		2019-20 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**442**	**36259**	**1362**	**120975**
UAE	-	-	1100	101073
Japan	80	8281	140	14362
South Africa	-	-	122	5481
Singapore	-	-	++	33
Ethiopia	-	-	++	17
Germany	-	-	++	9
Nepal	-	-	++	1
Cameroon	294	24844	-	-
Denmark	48	1636	-	-
Egypt	20	1402	-	-
Other countries	++	97	-	-

Figures rounded off

Table – 10 : Exports of Hydrofluoric Acid (By Countries)

Country	2018-19 (R)		2019-20 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**2198**	**211815**	**2475**	**237995**
Thailand	793	82227	650	74802
USA	91	7173	357	33221
Saudi Arabia	248	30415	269	30388
Canada	-	-	373	29605
Singapore	-	-	90	19004
Turkey	117	7111	280	15783
Australia	270	15323	143	7720
Bangladesh	71	6461	75	7414
UAE	25	2645	53	5387
Japan	5	441	55	5204
Other countries	579	60018	130	9467

Figures rounded off

Table – 11 : Imports of Fluorite
(By Countries)

Country	2018-19 (R)		2019-20 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**265445**	**7281830**	**239589**	**7225936**
South Africa	94035	2229129	89467	2700348
China	92686	2900052	82424	2482331
Thailand	47423	1365369	35719	1132821
Morocco	8593	247948	9612	329740
Vietnam	8723	225225	7989	224041
Netherlands	856	24506	3279	97955
UAE	3410	75873	4041	89781
Hong Kong	2457	59138	2175	58172
Spain	1993	42078	2106	42152
Norway	1392	38087	1204	33909
Other countries	3878	74425	1573	34688

Figures rounded off

Table – 12 : Imports of Hydrofluoric Acid
(By Countries)

Country	2018-19 (R)		2019-20 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**391**	**42198**	**969**	**89459**
China	315	32229	616	59287
Taiwan	-	-	276	20971
Germany	71	7362	76	7328
Japan	-	-	1	1069
Sweden	++	88	++	438
USA	++	61	++	179
Belgium	++	189	++	96
UK	1	910	++	65
Spain	++	9	++	18
France	++	1010	++	8
Other countries	4	339	-	-

Figures rounded off

Table – 13 : Imports of Aluminium Fluoride
(By Countries)

Country	2018-19 (R)		2019-20 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**62374**	**5607484**	**40362**	**3791020**
China	16946	1985301	19842	1930671
Italy	1107	97012	5832	559817
Jordan	2835	184892	6015	449707
Indonesia	6220	470133	4320	377171
Mexico	20300	1483470	2500	306144
Norway	-	-	1512	161514
Qatar	2711	33934	221	2798
Netherlands	67	2402	100	2219
Korea, Rep. of	-	-	20	964
Germany	-	-	++	11
Other countries	12188	1350339	++	3

Figures rounded off

FUTURE OUTLOOK

The major driving factors for fluorite market are the growing Chemical Industry and increasing use of fluorite in Cement, Iron & Steel, Glass Industries. The Chemical Industry and Glass Industry account for the major share of the fluorite demand globally. As per TANFAC Annual Report 2017-18, global fluoro-chemical market is expected to reach USD 2.2 billion by 2024, growing at a CAGR of 5.3% from 2016 to 2025.

As per USGS report, improvements in steel making technology have also reduced the unit consumption of fluorite per unit tonnes of steel produced. In less developed countries, the quantity of fluorite used as a flux in steel making continues to be much higher, but further efficiency improvements are expected to moderate growth.

As on 01.04.2015, the resources of fluorite in India are 18.18 million tonnes which is considered to be limited. Hence, to meet the requirements, the domestic Chemical Industry will have to depend, both qualitatively and quantitatively, on imported fluorite in the coming years, both for direct use and for blending with the domestic Acid grade fluorite.