

FELSPAR



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MINOR MINERALS 30.8 FELSPAR

(FINAL RELEASE)

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30-8 Felspar

Felspars are one of the most abundant rock-forming minerals in the earth's crust, comprising a complex series of aluminosilicates with varying amounts of potassium, sodium, calcium and, though rarely, barium. Common amongst these are the potash felspars called orthoclase and microcline ($K_2O \cdot Al_2O_3 \cdot 6SiO_2$), sodium felspar called albite ($Na_2O \cdot Al_2O_3 \cdot 6SiO_2$) and calcium felspar called anorthite ($CaO \cdot Al_2O_3 \cdot 2SiO_2$). The sodium and calcium felspars form a continuous series of solid solutions and are together termed plagioclase felspars. Though felspars occur in a variety of colours, pink, brown and grey felspars are known to be common.

Several varieties of felspar minerals are used as gemstones. Three of them, moonstone, sunstone and labradorite are known for their unique optical phenomena. The phenomenal properties of moonstone, sunstone and labradorite are that they almost always cut as dome-shaped cabochons. The uniqueness in their properties is observed when light strikes the microscopic structures within a polished stone at just the right angle. To make that happen, skilled craftsmen who understand the optical phenomena of these gems cut the stone in such a way that the planes where the optical phenomena are produced occur parallel to the bottom of the cut gemstone.

RESERVES/RESOURCES

As per NMI database, based on UNFC system, the total reserves/resources of felspar as on 1.4.2015 has been placed at 634 million tonnes of which 320 million tonnes (50.47%) constitute as "Reserves" and 314 million tonnes (49.53%) as "Remaining Resources". In terms of grades, Unclassified grade accounts for 57%, Pottery/Ceramic grade 18%, Glass grade 13% and Not-known & Others grades (6% each) of the total resources. By States, Rajasthan alone accounts for about 90% of the total reserves/resources followed by Telangana (4%), Andhra Pradesh and Tamil Nadu (2% each) (Table - 1).

EXPLORATION & DEVELOPMENT

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

PRODUCTION & STOCKS

As per Govt. of India Notification S.O. 423(E), dated 10th February 2015, 'felspar' has been declared as 'Minor Mineral', hence the producers report the production data directly to the respective States and not to IBM. However, efforts were made to collect this information through correspondence with the State Directorates of Mining and Geology of individual states or visiting their websites. All possible information/data that could be gathered has been presented in this Review.

Statewise production of felspar is furnished in Table-2.

Table-2 : Statewise Production of Felspar

(In tonnes)

State	Year		
	2015-16	2016-17	2017-18
Rajasthan	2517783	5611217	3250595
Telangana	673831	676811	798964
Andhra Pradesh	152053	144646	217245
Gujarat	106	2114	3441

Source: As received from State DGMs and their websites

USES & SPECIFICATIONS

Traditionally, potassium felspar obtained from labradorite are used as semi-precious stones.

In Ceramic Industry, felspar is used as fluxing agents and the commonly used ceramic flux contain potash felspar and sodium felspar. After clay, felspar is the biggest ingredient in the raw material batch for ceramic bodies. Typical felspar contents are < 25%

**Table – 1 : Reserves/Resources of Felspar 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	173383004	103054634	43403974	319841612	45903221	42467787	40160373	13882441	17928113	150012330	3371567	313725831	633567443
By Grades													
Glass	31101917	18964826	1116975	51183718	8069246	4155097	4088590	238133	181140	15735742	318842	32786790	83970507
Pottery/Ceramic	25598581	11659828	9048026	46306435	17946394	7997021	13703037	2462573	2417929	25265494	1238089	71030537	117336972
Others	9078676	888220	1552793	11519689	2480626	10933380	4250318	342147	100474	6621536	33048	24761530	36281219
Unclassified	106501350	71098791	31198970	208799110	16935671	19338463	17924472	634831	3195686	91436219	1762983	151228326	360027436
Not-known	1102480	442970	487210	2032660	471284	43825	193956	10204757	12032883	10953339	18605	33918649	35951309
By States													
Andhra Pradesh	2295253	150795	556263	3002311	4427537	50911	2379650	361444	1819937	1571271	442950	11053700	14056011
Bihar	-	-	-	-	-	-	35147	-	4195	4871499	-	4910841	4910841
Haryana	-	-	-	-	-	-	-	-	-	72164	-	72164	72164
Jharkhand	68789	15402	191913	276104	-	40766	348792	32510	120388	836061	-	1378517	1654621
Karnataka	-	-	-	-	103675	73613	107055	25000	135133	177300	3900	625676	625676
Madhya Pradesh	-	-	-	-	10330	-	6610	-	-	339851	-	356791	356791
Maharashtra	-	-	-	-	651835	-	323337	-	-	253731	-	1228903	1228903
Meghalaya	-	-	-	-	-	-	-	-	-	37449	-	37449	37449
Rajasthan	161965311	102283772	41417085	305666168	35514780	40938362	33919764	12410200	8488066	132329070	2866777	266467018	572133186
Tamil Nadu	738656	23386	7134	769176	1896213	620530	1101842	18870	69822	5465465	-	9172741	9941916
Telangana	8244089	526905	1231579	10002573	3163212	543605	1938177	134417	3890572	3657219	57940	13385142	23387715
Uttar Pradesh	-	-	-	-	-	-	-	-	-	200000	-	200000	200000
West Bengal	70906	54375	-	125281	135639	200000	900000	3400000	201250	-	-	4836889	4962170

Figures rounded off. Note " - " Nil

FELSPAR

in earthenware, 25-35% in sanitaryware, 15-30% in whiteware and 10-55% in floor & wall tiles.

In the Abrasive Industry, plagioclase felspar is used in the manufacture of acid-proof refractories. In Welding Electrode Industry, felspar is used as a flux which acts as an arc stabiliser and helps in protecting the molten metal from aerial oxidation.

Physical properties like good dispersability, chemical inertness, stable pH, low free silica content and brightness of 89-95% improve the filler properties of finely ground felspar material.

Ceramic Industry in India is about a century old and has formed a sizeable industrial base. The products generally comprises ceramic tiles, sanitaryware and crockery items. The Industry has

wide variance in type, size, quality and standard. Manufacturing units are spread all-over India. The state-of-the-art ceramic goods are manufactured in the country. The domestic technology is at par with international standard. During the last two decades, there has been a phenomenal growth in the field of high end technical ceramics to meet specific demands of industries like high alumina ceramic, cutting tools and other structural ceramics.

WORLD SCENARIO

World resources of felspar are large. The major producers of felspar are Turkey, Italy and China. Substantial production also comes from India, Thailand and Iran.