

CORUNDUM AND SAPPHIRE



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CORUNDUM AND SAPPHIRE

(FINAL RELEASE)

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11 Corundum and Sapphire

Corundum is very hard, tough and stable mineral which occurs in different colours, such as, white, grey, blue, green, red, yellow or brown based on impurities present. It is usually found in metamorphosed shales in veins and in some igneous rocks. Corundum occurs as a mineral in mica schist, gneiss and some marbles in metamorphic terrain. It also occurs in low silica igneous syenite and nepheline syenite intrusives. Other occurrences are as masses adjacent to ultramafic intrusives, associated with lamprophyre dykes and as large crystals in pegmatites. It commonly occurs as a detrital mineral in streams and beach sands because of its hardness and resistance to weathering. It is used as an abrasive and as gemstone. As gems the red variety is called ruby and blue, sapphire. It is composed of aluminium oxide (Al_2O_3). Its crystal structure is hexagonal (rhombohedral). The ruby and sapphire are mineralogically mere coloured crystals of corundum.

RESOURCES

The resources of corundum in India are found in association with kyanite and sillimanite in Assam, Meghalaya and Maharashtra. It occurs in syenites and ultrabasic rocks in Telangana. A few outcrops of pegmatites containing corundum occur in Bastar district, Chhattisgarh and Morena district, Madhya Pradesh. Translucent to opaque ruby, sometimes with asterism is known to be abundant in Mysuru district in Karnataka.

Precious and semi-precious varieties of corundum have been reported from Tamil Nadu in Kangeyam belt stretching over Karur and Kulithalai tehsils in Tiruchirappalli district and Vedachandur tehsil in Dindigul district.

As per UNFC System as on 1.4.2013 (provisional), the total resources of corundum were estimated at 268 thousand tonnes of which 598 tonnes were placed under Reserves category and the bulk of over 267 thousand tonnes under 'Remaining Resources' category. The resources of corundum are located in Karnataka (65%), Telangana (29%) and Rajasthan (4%), besides a share of the Remaining Resources was contributed by Tamil Nadu, Chhattisgarh and Andhra Pradesh.

The total resources of ruby was estimated at 5,349 kg of which 236 kg were placed under Reserves category and the balance 5,113 kg under 'Remaining Resources' category. The entire resources are located in Odisha. The total resources of sapphire were estimated at 450 kg, all of which are placed under 'Remaining Resources' category and are located in Jammu & Kashmir (Table - 1).

EXPLORATION AND DEVELOPMENT

No exploration was reported during the year 2014-15 by any exploratory agency.

PRODUCTION, STOCKS AND PRICES

Corundum

As per GoI notification S.O.423(E) dated 10.02.2015, "Corundum" has been declared as "Minor Mineral". However, Sapphire is retained as major mineral.

No production of corundum was reported during the years 2013-14 and 2014-15 respectively. Similarly no mine-head stock of corundum was reported in both the years (Table-2).

Ruby

There was no production of ruby in both the years, i.e., 2013-14 and 2014-15.

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Table – 1 : Reserves/Resources of Corundum as on 1.4.2013
(By Grades/States)

Grade / State	Reserves			Remaining Resources					Total Resources (A+B)			
	Proved STD111	Probable		Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332		Inferred STD333	Reconnaissance STD334	
		STD121	STD122		STD221	STD222						
All India : Total	100	310	188	598	763	62872	13	38	92389	52675	267218	267816
By Grades												
Semi-Precious	-	22	-	22	-	-	-	1	895	-	908	930
Industrial	100	288	188	576	53579	-	-	28	77073	52675	236751	237327
Others	-	-	-	-	-	-	-	-	4	-	4	4
Unclassified	-	-	-	-	11	-	13	1	2534	-	2558	2558
Not known	-	-	-	-	-	9282	0	8	11883	-	26997	26997
By States												
Andhra Pradesh	-	-	-	-	7	-	-	-	-	-	7	7
Chhattisgarh	100	310	188	598	-	-	-	-	288	-	288	885
Karnataka	-	-	-	-	52645	53590	13	38	14169	52675	173885	173885
Rajasthan	-	-	-	-	-	-	-	-	11925	-	11925	11925
Tamil Nadu	-	-	-	-	-	-	-	-	4000	-	4000	4000
Telangana	-	-	-	-	5824	9282	-	-	62007	-	77113	77113
RUBY* (In kg)												
All India : Total	143	-	93	236	-	3165	286	38	1623	-	5113	5349
By Grades												
Unclassified	143	-	93	236	-	3165	286	38	1623	-	5113	5349
By States												
Odisha	143	-	93	236	-	3165	286	38	1623	-	5113	5349
SAPPHIRE* (In kg)												
All India : Total	-	-	-	-	-	-	-	-	450	-	450	450
By Grades												
Unclassified	-	-	-	-	-	-	-	-	450	-	450	450
By States												
Jammu & Kashmir	-	-	-	-	-	-	-	-	450	-	450	450

*Reserves/Resources as on 1.4.2010

Figures rounded off.

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**Table – 2 : Production of Corundum, 2012-13 to 2014-15
(By States)**

(Qty in kg; Value in ₹'000)

State	2012-13		2013-14 (R)		2014-15(P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	5000	75	-	-	-	-
Karnataka	5000	75	-	-	-	-

CONSUMPTION

Industry-wise consumption of corundum is not available.

The area of Mogok, Myanmar is the source of some of the best gem-quality Ruby. Another significant Burmese deposit is Mong Hsu.

WORLD REVIEW

The oxide corundum is widespread worldwide but its gestation and preservation are sufficiently demanding that it is not a common mineral. Corundum & Sapphire are reported from Sri Lanka, especially from the area of Ratnapura, Bibile and Rakwana. Ruby with a brownish tint comes from Thailand, in the Chantaburi district. Fine gem Ruby and Sapphire come from Luc Yen, Yenbai Province, Vietnam; the Hunza Valley, Gilgit, Pakistan; and Jegdalek, Sorobi district, Afghanistan. Gem quality Sapphire is reported from Pailin, Cambodia. Africa has also become a significant producer of Corundum, especially in Madagascar, where it is found in the Zazafotsy Quarry, Ambahatraso; and in Andranondambo, Amboasary district. Rubies are found in Longido, Kilimanjaro Region and Winza, in Arusha area, Tanzania. In the U.S., the Yogo Gulch near Helena and waterworn Sapphires stones are found in the Missouri River throughout its length.

FOREIGN TRADE

There were no exports of Corundum (natural) in 2014-15. Exports value of uncut ruby and sapphire decreased substantially to ₹ 12.68 crore in 2014-15 from ₹ 19.44 crore in the previous year. (Table - 3).

Imports of Corundum (natural) were only 2 tonnes in 2013-14 and there was no import in 2014-15 (Table-4) . Imports value of uncut ruby and sapphire decreased to 42 tonnes valued at ₹ 389 crore in 2014-15 from 66 tonnes, valued at ₹ 243 crore in the previous year. Imports were mainly from Thailand (38%), South Africa (24%) and Brazil (7%) (Table - 5).

**Table -4: Imports of Corundum (Natural)
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty	Value	Qty	Value
	(t)	(₹ '000)	(t)	(₹ '000)
All Countries	2	96	-	-
China	2	96	-	-

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**Table – 3: Exports of Ruby and Sapphire: Uncut
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹ '000)	Qty (t)	Value (₹ '000)
All Countries	7	194458	++	126769
Singapore	-	-	++	97919
Thailand	++	3925	++	6361
USA	6	5558	++	4655
Switzerland	++	10816	++	4232
Hungary	++	580	++	3393
Germany	++	4388	++	3063
France	-	-	++	2295
Hong Kong	1	1453	++	2208
Israel	++	4191	++	1364
Iran	-	-	++	771
Other countries	++	163547	++	508

**Table – 5: Imports of Ruby and Sapphire: Uncut
(By Countries)**

Country	2013-14		2014-15 (P)	
	Qty (t)	Value (₹ '000)	Qty (t)	Value (₹ '000)
All Countries	66	2428497	42	3890352
Hong Kong	1	619982	1	2327250
Zambia	4	449820	2	247557
Thailand	17	342853	16	243669
South Africa	++	14816	10	208538
Singapore	-	-	++	206632
Brazil	4	351607	3	170523
Mozambique	1	46199	1	169221
UAE	4	472229	++	142136
Ecuador	++	2471	++	37686
Israel	++	10657	++	27425
Other countries	35	117863	9	109715