

9.23 ZIRCON

Introduction

Economically workable concentration of zircon ($ZrSiO_4$) associated with ilmenite, rutile, monazite and sillimanite occur in the beach sands of the coast of Kerala, Odisha and Tamil Nadu. Indian Rare Earth Ltd., and Kerala Minerals and Metals Limited are engaged in mining and processing of beach sand. Its concentration in the deposits is about 0.6-18.7% of total heavy minerals. Indian Zircons analyse 63-66% ZrO_2

Owing to its properties like chemical inertness, good heat conductivity, high specific gravity, good resistance to abrasion, high melting point and no shrinkage after being heated up to 1750°C, zircon is found to be an outstanding refractory raw material. It is also used in ceramics, foundry and abrasive industry. Gem variety of zircon is used in jewellery.

Beach sand rich in minerals are found extending over three important coastal belts.

1. A 22 km long stretch between Neendakara and Kayamkulam in Kollam district, Kerala.
2. A 6 km long belt stretching from the mouth of Valliyar river to Manavelakurichi and Colachel villages along the west coast in Kanyakumari district, Tamil Nadu.
3. A 20 km long stretch of Chhatrapur coast along Gopalpur village in Ganjam district, Orissa.

Basis of Grade Classification

Exploration agencies or the lessee do not report the resources of zircon as per its end-use grade. However, zircon is mainly consumed in the refractory industry followed by foundry. It is used only after beneficiation of the unclassified zircon. There are no BIS specifications of zircon. Therefore, resources in the inventory as on 1.4.2015 have been placed as 'unclassified grade'.

Basis of categorisation of Resources

As per United Nations Framework Classification (UNFC), resources are broadly classified into 'reserves' and 'remaining resources'.

According to the norms of this system, reserves of zircon have been placed under proved (111) and probable (121) & (122) categories. The remaining resources have been placed under feasibility (211), prefeasibility (222), measured (331), indicated (332) & inferred (333) categories.

Salient Features of Inventory

The total resources as on 1.4.2015 of zircon in the country are estimated at 3,423,203 tonnes. These resources include 1,158,290 tonnes (34%) of reserves and 2,264,913 tonnes (66%) of remaining resources.

All India scenario of zircon reserves, remaining resources and total resources as on 1.4.2015 vis-a-vis 1.4.2010 have been given in Tables - 1 and 2. The tables give an idea about the changes in terms of increase or decrease of resources as per lease status, grade and state. In Table-3, district wise reserves/resources as on 1.4.2015 have been given.

Out of the total 3,423,203 tonnes of total resources, 346,598 tonnes have been estimated in freehold and remaining 3,076,605 tonnes have been estimated in the leasehold (public) category. of the total resources, Kerala is credited with 2,759,107 tonnes (80.6%), followed by Odisha 488,876 tonnes (14.3%) and Tamil Nadu 175,220 tonnes (5.1%)

The resources of zircon have been increased by 289,250 tonnes (9.23%) as compared to the earlier inventory as on 1.4.2010. These changes have occurred due to reporting of 4 new freehold deposits in Ganjam & 1 new freehold deposit in Puri district of Odisha by Director of Geology, Govt. of Odisha and 1 new L/H public deposit in kanyakumari district of Tamil Nadu was also reported by M/s Indian Rare Earths Ltd. However, no change in the resources was recorded in Kerala.

Of the total resources of zircon, about 1,044,554 tonnes (30.5%) have been estimated under inferred (333) category. These resources are based on a limited preliminary exploration. if these resources are explored further, the confidence level of resource estimation may improve.

A total 24 deposits of zircon have been covered in NMI as on 1.4.2015, and out of these 24 deposits, 6 are in freehold and 18 deposits are in leasehold (public) category.

**Table - 1 : Reserves/Resources of Zircon as on 1.4.2015 (P) vis-à-vis 1.4.2010
(By Lease Status/Grade)**

Lease status/Grade	Reserves		Remaining resources		Total resources		(In tonne)
	1.4.2015	1.4.2010	1.4.2015	1.4.2010	1.4.2015	1.4.2010	
All India : Total	1158290	1347470	2264913	1786483	3423203	3133953	(+) 289250
Unclassified	1158290	1347470	2264913	1786483	3423203	3133953	(+) 289250
Freehold	-	-	346598	-	346598	-	(+)346598
Leasehold (Public)							
Unclassified	1158290	1347470	1918315	1786483	3076605	3133953	(+)57398

figures rounded off

NATIONAL MINERAL INVENTORY - AN OVERVIEW

**Table – 2 : Total Resources of Zircon as on 1.4.2015 (P) vis-à-vis 1.4.2010
(By States)**

(In tonne)

State	Total Resources		Net Change
	As on 1.4.2015	As on 1.4.2010	
All India : Total	3423203	3133953	(+)289250
Kerala	2759107	2759107	-
Odisha	488876	146085	(+)342791
Tamil Nadu	175220	228761	(-)53541

figures rounded off

Table - 3 : District wise Reserves/Resources of Zircon as on 1.4.2015 (P)

(In tonnes)

State/District	Reserves	Remaining Resources	Total Resources
All India : Total	1158290	2264913	3423203
Kerala	972624	1786483	2759107
Alapuzha	-	67157	67157
Kollam	972624	1719326	2691950
Odisha	146085	342791	488876
Ganjam	146085	303491	449576
Puri	0	39300	39300
Tamil Nadu	39581	135639	175220
Kanyakumari	39581	135639	175220

figures rounded off