

## DETAILED PROFILE OF KEY MINERALS OF ANDHRA PRADESH

### I. BAUXITE

The Bauxite deposits of Andhra Pradesh and Odisha located and explored in recent years are referred to, by virtue of their proximity to the east coast of India as the East Coast Bauxite Deposits of India. The East Coast Bauxite Deposits, albeit recent entrants on the bauxite map of India have brought about a spectacular boost to the bauxite resources of the country. The total resources estimate around 350 Mt in 1971, have now shoot up to nearly 2000 Mt, nearly a six fold increase and is also one of the creditable contributions by GSI as regard to mineral wealth of the country.

Bauxite is an important aluminium ore, includes variable proportions of gibbsite ( $\text{Al}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$ ), boehmite ( $\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$ ) and diasporite ( $\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$ ). The content of  $\text{Al}_2\text{O}_3$  and  $\text{H}_2\text{O}$  varies from 65% to 85% and 3.4% to 15% respectively. Besides, bauxite contains variable amounts of impurities like silica, titania and iron. Apart from its chief use as source for aluminium, bauxite is also used in the manufacture of abrasives, chemicals, cement, refractories and oil filters.

Bauxite deposits occur as high level capping over the rocks of the Eastern Ghats Supergroup in East Godavari, Visakhapatnam and Vizianagaram districts. The cappings are confined to gentle to moderately sloping areas with elevations of about 900m MSL. They are formed by *in situ* residual weathering of the parent rocks under tropical conditions during the Tertiary-Quaternary period. The quality and thickness of the bauxite cappings over khondalite is much better compared to the ores over charnockite because the well foliated khondalite, being inherently rich in alumina minerals like sillimanite, has facilitated intense leaching resulting in the formation of a much thicker bauxite profile than the relatively impervious and less Al-rich charnockite. Further, khondalite, being a metapelite, is more aluminous and an ideal source rock giving rise to high quality bauxite. The bauxite developed over khondalite is medium hard to soft leading to a porous and spongy variety whereas that developed over charnockite is massive and very hard and is generally vermicular. The bauxite is characterised by the presence of glistening gibbsite, which also occurs as amorphous white patches.

The bauxite is hard and massive on the top becoming relatively soft and spongy at depth. It is reddish brown, pink, cream and occasionally yellowish brown. Gibbsite is the major constituent, which also contains substantial haematite and goethite making them iron rich. The alumina content varies from 42% to 56% and iron oxides from 8% to 28%. The content of silica (<4%) and titania (<2%), in general, is low. The bauxites show significant enrichment of Ga, V, Zr, Mn, Ce and Th.

The bauxite deposits of the State, bounded by latitudes 17°47'00" and 18°30'00" and longitudes 81°53'00" 83°53'00" and 83°30'00" occur scattered in a general NE-SW direction over a length of 130 km and a width of 20 km. These deposits can be broadly grouped into three Groups viz., Gurtedu Group (East Godavari District), Chintapalli Group (Visakhapatnam District) and Anantapur Group (Visakhapatnam and Vizianagaram districts). The deposits extend further north into Orissa.

Andhra Pradesh ranks second next to Orissa in the bauxite reserves. The bauxite deposits of the Eastern Ghats in Andhra Pradesh and Orissa with a total reserve of 2423.538 Mt constitute one of the biggest deposits in the world. The reserves estimated in the three Districts of AP are placed at 615.27 million tonnes from 22 deposits (Table-4). At present, NALCO is exploiting some of the bauxite cappings in Orissa while those in Andhra Pradesh still remain untapped.

### **East Godavari District**

Bauxite deposits of the district are on the hill ranges to the west of Gurtedu, Peddakonda and adjacent hill ranges to the north and northwest of Pallanagi, Katamarajukonda, Y. Ramavaram, Chidipalem, Pedda Addapalli, and Addatigala. A total reserve of 142 Mt was estimated from 14 occurrences investigated in the Gurtedu-Maredumilli area. Of these, the capping at Katamarajukonda near Gurtedu with a reserve of 42 Mt is the most promising.

The potential of the inaccessible Pedda Konda and adjacent hill ranges is yet to be assessed. This may significantly increase the reserve position in the District. A resource of 44.7 Mt is estimated for the district.

### **Visakhapatnam and Vizianagaram Districts**

The deposits are located on the hill ranges in the vicinity of Sunkarametta, Anantagiri, Araku, Paderu, Chintapalle, Jerrela and Sapparla. In Anantagiri area, the deposits occur on Galikonda, Raktakonda, Katuki and Chittamagondi hills with a total reserve of about 55 Mt analyzing 46% to 51%  $\text{Al}_2\text{O}_3$ , with less than 3% silica. The total areal spread is about 2.75 sq km for six cappings. In Jerrela area (NW of Chintapalli), a cluster of bauxite cappings occur with a cumulative area spread of about 14 sq km and a total reserve of 245 Mt containing about 46%  $\text{Al}_2\text{O}_3$ . For Sapparla area also, the cumulative areal spread is about 14 sq km with a reserve of 185 Mt containing 45% to 47%  $\text{Al}_2\text{O}_3$ . In Gudem area, about 15 km west of Chintapalli, a reserve of 38 Mt with 47% to 49%  $\text{Al}_2\text{O}_3$  is available.