



Petrography Study Of Bauxite Ore In Mainpat Plateau Of Surguja Province, Chhattisgarh, India

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Abstract

India has one of the largest producers of the bauxite in the world. Bauxite is generally found in aluminous laterite and the prime source of the aluminium. Approximately 2 billions tons of bauxite reserve was in India. The study was taken place in Mainpat plateau, surguja province of chatishgarh state. The bauxite in this region is formed by ultering and intense weathering. The results of thin section prepared by the sample collected shows that the presence of Dias pores, Goethite, and Gibbsite.

Keywords: Bauxite, Petrography study, Laterite, Gibbsite.

Introduction

Bauxite is an aluminous rock containing hydrated aluminum oxide, silica and titania in a varying proportions. It is a nonferrous metals and principle ore of aluminum which is largely used in modern industry. The name bauxite was given by Dufrenoy in 1845 for a material occurring near Les Beaux, France. The normal colour of bauxite is pink but with tin impurities. It shows oolitic and pisolitic structure and ots hardness varies in between low specific gravity to 2.6 and the composition is Al_2O_3 . Aluminum ore is generally used in the making of Aircraft bodies, Petrol tank ,Cylinder heads etc. The other important uses of bauxite in making of refractory's, abrasive, chemical in aluminous cements. Odisha, Chatishgarh, Jharkhand, Gujurat, Maharshtra, Madhyapradesh, Karnataka, Tamilnadu, Uttarpradesh and Goa are the major producers of bauxite ore in India.

Study area

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The area of the research is Mainpat Plateau in Surguja province Chattisgarh state in India. It is located between longE83°18'0" to 83°22'30" and lat N22°43'30" to 22°49'30". The whole study area is 83.33sq.km and it covered with Deccan traps. The area is located in 1060m above MSL. Bauxite and laterite are the extreme chemical weathering of preexisting aluminous rock. The mining the area was started by BALCO in 1998 and still going on.

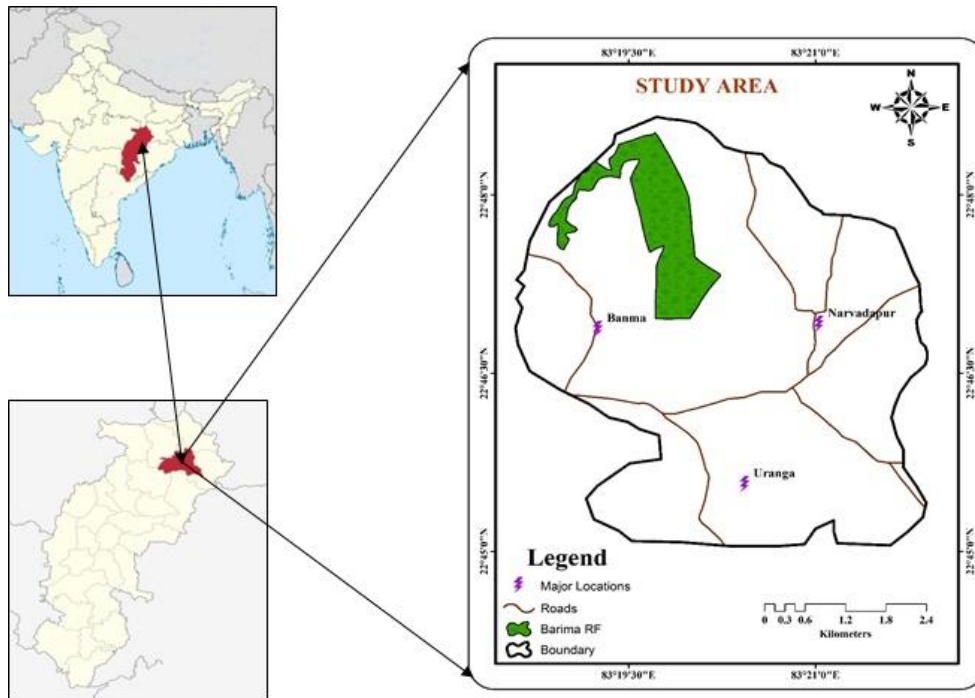


Fig. 1 Study area

Petrography study of Bauxite

Three samples were collected for preparation of thin sections for the identification mineral. In the thin section study Gibbsite (G), Diaspore (D), Cliachite (C), Goethite (GO) and Feldspar (F) are minerals are identified. Brownish yellowish colour, Oolitic structure and weak pleochroism as Diaspore are find out in reflecting Microphotograph.

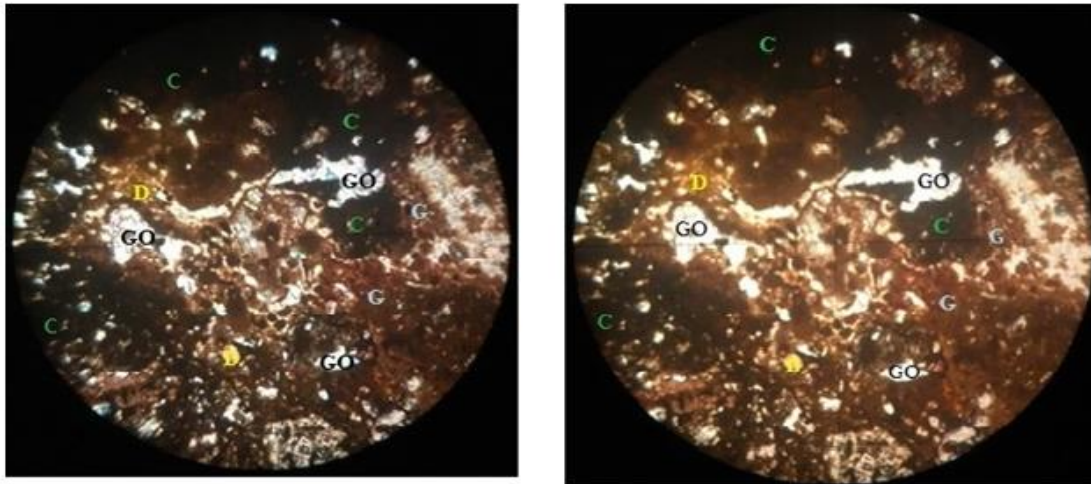


Fig. 2 Thin section view of Bauxite

Gibbsite with pale brown colour with weak pleochroism and moderate relief are finding out in Ore Microphotograph. Aluminous ore is the main minerals find out and Goethite with opaque to sub vitreous lustre, whitish blue color and ubiquitous.

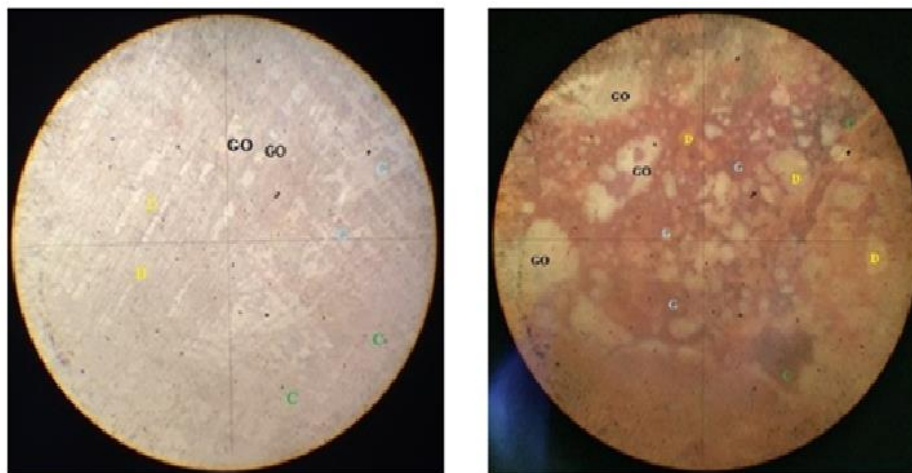


Fig. 3 Ore Microphotograph of Bauxite

Result and discussion

Megascopic studies find out the presence of gibbsite, brownish laterite. Presence of gibbsite, diaspore, clacite and goethite are found out in the Microscopic studies. Mainpat area is covered with Deccan traps Bauxite in the Mainpat plateau are the results of extensive weathering and change in chemical composition. Different in mineralogy and chemical composition are shown in the deposits. Diaspore, gibbsite, anatase, hematite, and boehmite are the the minerals found the petrography study. Quartz and micas are absent in the region. Lyching process made a significant impact on the bauxite deposit. The petrography study

shows the presence of high quality Bauxite ore in the region. Economically this area has a huge impact on the surguja province.

Conclusion

It is a nonferrous metal and principle ore of aluminum and has a huge impact in modern industry. Haematite, Goethite, Bohemite and silica are the various iron oxide bauxite ore are present in it. Pink is the original color of Bauxite with little impurities it shows brownish. Bauxite has pisolitic and oolitic structure and its hardness varies from low specific gravity to 2.6 Refractory bauxite is used mainly in making firebrick and mixer having Al_2O_3 contents in the Aluminium extraction plant of BALCO is operational at Korba, based on the leased bauxite blocks of Mainpat in Surguja district from their own Mine Lease area (MLA), lease hold areas of Chhattishgarh Mining Development Corporation (CMDC). And other operators are at Kalahandi, Bolangir, Koraput, Sundargarh and Sambalpur of Odissa are the main bauxite producing districts.

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References

1. Rawat K.S. and Sehgal V.K., Ray SS IF: 0.858 Soil Moisture Retrieval using observation at C-band of RISAT-1 over a Sub Tropical Semi Arid Area of Rewari District State of Haryana (India).
2. Rawat, K.S., Mishra, A.K. and Bhattacharyya, R. IF:1.224 Soil erosion risk assessment and spatial mapping using LANDSAT7 ETM+, RUSLE and GIS-A case study
3. Kumar R., Rawat KS., Singh J., Singh A., and Rai A., NASS: 5. 08 Soil Aggregation Dynamics and Carbon Sequestration
4. Rawat K.S Soil erosion risk assessment and spatial mapping in Jhagrabaria watershed, Allahabad, U.P. (India) by using LANDSAT 7ETM+ remote sensing data, Revised Universal Soil Loss Equation (RUSLE) and Geographical Information System (GIS)
5. Mishra, B. K., Hemraj, Saha, B. and Shreeramamurthy, A. (2008): Regional search for lamproite/ kimberlite in Tapti lineament zone in Raigarh, Jashpur and Surguja districts of C.G., Unpub. Rep. Geol. Surv. Ind., F.S. 1997 to 2000
6. Patel, D. R., Dhekaware, H. D. and Kankane, S. (2005): Bauxite deposits of Mainpat plateau, Surguja district, Chhattisgarh, India. ICSOBA-2005, pp 242-249.
7. Rao, M. G. and Raman, P. K. (1979): The east coast bauxite deposits of India. Bull. Series A, Econ. Geol. No. 46, G.S.I. pp 24

8. Schellmann, W(1975): Formation of and prospecting for tropical bauxite above silica te rocks: mining magazine, vol. 133, no. 1, pp 33-39.
9. Valetton
(1972) Bauxite, Elsevier publishing company, Amsterdam, London, New York, pp 1- 126.
10. V. N. Patel, R. K. Trivedi, S. H. Adil and R. B. Golekar (2013): Geochemical and mineralogical study of bauxite deposit of Mainpat Plateau, Surguja District, Central India, Vol-7, pp- 3505-3512