American Journal of Engineering Research (AJER)
e-ISSN: 2320-0847 p-ISSN : 2320-0936
Volume-5, Issue-5, pp-59-62
www.ajer.org
Research Paper Open Access

Geochemical Analyses in Mineral Deposits " Çikatova e Vjeter" in Drenas Area-Kosovo

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ABSTRACT: *Mineral deposit Çikatova e Vjeter consists of two ore bodies that are laterites process iron-nickel products of weathering crust developed in ultrabasic rocks. Dushkaja ore body present Nicel-Iron silicate product of weathering crust coverage primary type formed up serpentenites. Ore body Suka is typical resedimentation Quaternary deposits of Iron- Nickel laterite consists of four lentils with irregular shapes unrelated to each other and is located south of Dushkaja distance of 800 m. Studies have determined different vertical zonality in weathering crust of ore body Dushkaja and Suka which are separate zones with geochemical characteristics. Content of nickel in ore body "Suka" compared with Ni in Dushkaja not show any significant poorer. Mineral deposits Cikatova e Vjeter is locating in Drenas region Kosovo territory. The paper aims thanks of metalogeny analyse to clarify and define the main geology conditions nickel ore forming deposits in time and space in the territory of Kosovo and defining criteria for research and finding of new metalogeny units with iron-nickel ore.*

Keywords: *metalogeny analyse, mineral deposit, nickel silicate, ore , weathering crust,*

I. INTRODUCTION

Kosovo region is a part of central meridian metallogeny province (ex Yugoslavia, Albania, Greece and Turkey) related to initial of continental riftogenese where powerful has been present development of facie carbonate type, mainly dolomite with a complex magmatic activity [5,10]. The territory of Kosovo characterization with a complicated geological structure that is reflected with show of different rocks, of different ages (Neo-Proterozoic to the Holocene) and many wrinkled structures and detaching with the following spreading directions: NNE-SSW, NNW-SSE and NW-SE

Ore deposit "Çikatova e Vjeter" extends in the south parts of peridotite massif Doroshevc, Figure 1. The geology of this region built of serpentinite, metamorphic series of conglomerates, sand and limestone, sediments of Cretaceous, Pliocene and Quaternary deposits, Figure 1.This region belongs to Vardar ophiolite zone that is characterized with tectonic structures by NNW-SSE extension [1,2]. These terrains represent parts of Drenica basin formed during longitudinal fractures Verbovce –Baks and Suke-Kamenice-Krasniqe, Figure1.

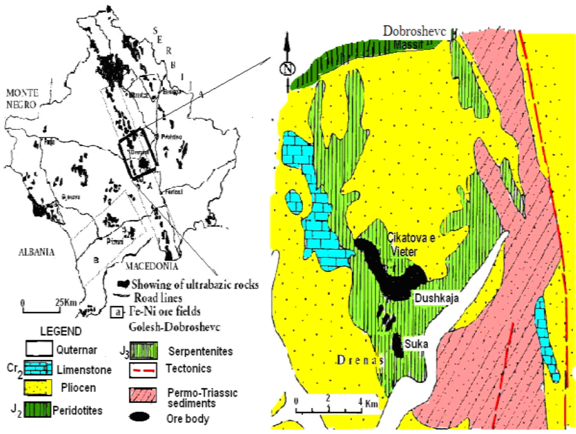

Figure 1. Distribution of ultrabazic rocks in Kosovo and geological map of region Drenas –Drenica, with locate of Ore deposit Suka and Dushkaja extension [6]

II. NICKEL SILICATE MINERAL DEPOSITS OF "CIKATOVA E VJETER"

Mineral deposit Cikatova e Vjeter saves all lithological and structural characteristics of peridotite massiv Dobroshevc [3,9]. Ore body Dushkaja is located in the northern part of village Çikatova e Vjeter municipalities Drenas central Kosovo, Figure . In south this village at a distance of 800m found the ore nickel silicate deposit "Suka" composed of four lentils Figure 1.

Ore body Dushkaja full comply with the extension of serpentinite which in the north dives under Pliocene sediments and has area over 80 hectares. Ore floor contact complies with paleorelief and ceiling contact with relief Figure 2. Thickness nontronite ore body Dushkaja is about 10m and is determined that nontronite is friable material red to yellow colored part of upper body and green in the lower gray color part down ore body. Composition nickel in ore body is average 1.47%. Dushkaja ore body keeps constant characteristics construction geochemical zones. In the vertical-down direction divided these lithological and mineralogical zones [6-8]: 1.Pliocene sediments (clay and sandstone), 2.hydrooksyde Fe oolite zones, 3.notronite ore zones,4. Serpentinite partly nontrontized zone,5.serpentinite zones, Figure 2

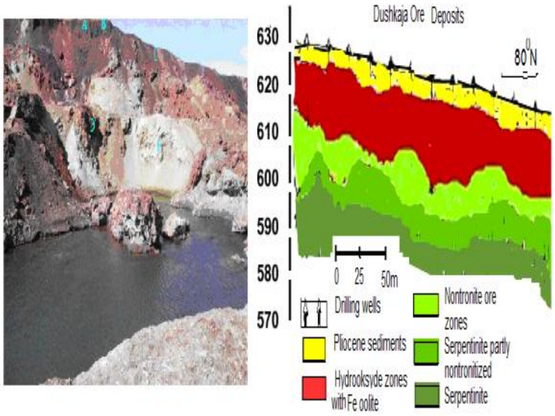

Figure. 2.Foto and geology profile of Mineral deposits Dushkaja[6]

Mineral deposit Suka has an area of 5.8 hectares composed of four lentils ore body where weathering crust, thickness ranges from16 to 36m. In geological structure ore body participate this geochemical zone: 1.red clay with opal (in same place mineralized), 2. nontronite ore, 3.opal-silification zone, 4. kaolinite clay,5.metamorphosed sandstone (rarely serpentinite) Figure 3.

Ore have coverage form and in accordance with the relief decline towards the east at an angle of 8 °, Figure 3. The border of ore body with the surrounding rocks is clearly stated and does not indicate local deviations from the general direction of the fall the ore layer.

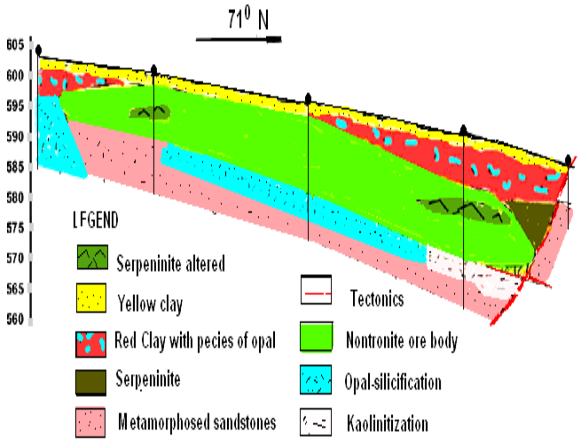

Figure 3. Characteristics profile of ore body Suka[6]

III. MATERIALS AND METHODS

To determine chemical content of nickel are treated seven composite sample from geochemical zone ore body Dushkaja and five composite samples from drilling wells by for each lentils ore body Suka , in total 60 composite samples. Chemical compositions are determined with chemical and spectrochemical methods in mining laboratory in Çikatova Vjeter ("Ferronickel"-company) in Drenas location next to Prishtina.

The result in the tables is presented as the percentage average ore bodies. From analysis of these methods are defined these chemical macro elements; Si, Al, Cr, Fe, Mn, Ni, Mg, Ca and microelements; Pb, Zn, Cu, and S. Results of this study are presented in Tables 1 and Table 2.

3.1 EXPERIMENTAL RESULTS OF CHEMICAL ANALYSES

The Table 1 and Table 2 shows the chemical composition the samples by geochemical zones of materials of lateritic weathering crust of ore body "Dushkaja: and ore body "Suka" treaded from chemical and spectrochemical analysis[4,11].

Chemical data from Table 1 and Table 2 show that the laterites process from weathering crust material are developed in favorable physical and chemical conditions with intensive rinse in an alkali, alkali neutrally and acidic medium.Chemical alienation of aluminum silicates in the weathering crust has began with hydration process where starts oxidation of minerals then it ends hydrolysis and separation of cations of Na+, K+, Ca2+, Mg2+, etc., and finally carried the accumulation of SiO2, Al2O3, Fe2O3 and MnO2 in residue form. NiO content reaches the highest in the base notronite zone because the highest concentration pimelite rare lisardite and then decreases almost linearly towards the surface and bottom.

All oxides are depleted where is grown silicon in the quartz-opal zone in Suka and nontronite zone in Dushkaja .Microelements are enriched in clay laterite disintegration products, and poor in silicon formations and other geochemical zones.

Table 1.Results of chemical and spectrochemical analyze in mineral deposit Dushkaja. Mining laboratory "Ferronickel "Drenas,

%	Hydrookside Fe oolitic zone	Notronite zone	Serpentinte partly to nontronitezed zone	Serpentinite zone
SiO_2	20.90-33.52	45,61	39.89	38.73
FeO	37.90-53.60	25.23	14.98	7.56
Al_2O_3	7.59-16.44	2.81	1.87	1.45
MgO	1.70-2.13	7.66	32. 31	35.84
CaO	0.10-0.20	2.81	0.81	0.23
TiO_2	-	-	-	0.02
Cr_2O_3		1.64	0.82	0.63
Na_2O	-	-	-	0.12
MnO	-	-	-	0.22
K_2O	-	-	-	0.26
CO_2	-	-	-	0.19
Fe_2O_3	-	5.14	6.40	8.40
NiO	0.07-0.20	1.47	0.8	0.20
Co	0.012	-	-	0.002
Cu	-	0.015	-	-
Pb	-	trace	-	-
Zn	-	0.28	-	-
As	-	-	-	-
Pt	-	-	-	-
S	-	-	-	0.06

Table 2. Results of chemical and spectrochemical analyze in mineral deposit Suka. Mining laboratory "Ferronickel "Drenas,

%	Red clay with opal zone	Notronite zone	Opal-silification zone	Kaolinite clay zone	Metamorphosed sandstone zone
SiO_2	68.75	45,59	76.55	34.53	43.90
TiO_2	0.12	0.05	-	0.02	-

Al_2O_3	6	2.06	0.33	4.83	0.015
Cr_2O_3	0.15	0.35	-	0.09	0.02
Fe_2O_3	9.18	29.75	12.30	6.45	8.10
FeO	0.18	0.21	0.02	027	-
MnO	0.7	0.04	-	0.4	-
NiO	0.12	1.34	0.28	0.16	0.24
MgO	3.09	5.32	0.12	7.08	4.95
CaO	0.25	1.30	0.14	0.45	0.012
Pb	-	trace	-	-	-
Zn		0.36	-	-	-
Bi	-	trace	-	-	-
As	-	0.12	-	-	-
Cu	-	0.01	-	-	-
Pt	-	-	-	-	-
S	-	0.05	-	-	-

IV. CONCLUSION

Dushkaja ore body is typical products weathering laterite crust primary type of Fe-Ni silicate up serpentinite (in situ). Weathering crust in Suka deposit is formed in resedimentation process a marine environment with approximately the same physical and chemical conditions as ore body Dushkaja, north of Suka distance of 800m. Average of nickel in ore deposit Dushkaja is 1.47%. Products of weathering crust of Dushkaja are destroyed of erosion process and products of this material crust are transported in gravitativy road in colloidal solutions form in shallow water basins and deposited in Permo-Triassic sediments which is formed the lentils of Fe-Ni silicate ore body in Suka locality. New redeposit crust represented by red iron clay containing pieces of opale, serpentinite, carbonates and the crust of iron with oolitic construction.

Quaternary redeposit crust extends the angular disagreement of Permo-Triassic sediments. Content of nickel in ore body "Suka" is 1.34% and compared with Ni in "Dushkaja" not show any significant poorer. This is apparently due to the small transport distance of colloidal solutions.

Characteristics common lithological studies show that of that the primary type of weathering crust of iron-nickel silicate is related to ultrabasic rocks. This type of mineral deposits meets in depressions structures as basin mainly to the effect of traction tectonics where ore products are stored from the Quaternary sediments. The weathering crust was formed during Lower Cretacus until Neogene.

Metalogenic analysis has enabled the determination of the main geological premises as they lithological stratigraphic, structural, genetic and geochemical Metalogenic analysis has enabled the determination of the main geological premises as they lithological-stratigraphic, structural, genetic and geochemical. Knowing well of these geological premises has scientific and economic interest for further research to the territory of Drenica and Kosovo where are ophiolitic areas and weathering crust developed as national interest.

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