ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 07, Issue, 06, pp.13415-13421, June, 2017

ORIGINAL RESEARCH ARTICLE | Open Access

CONTRIBUTION TO MINERAL EXPLORATION ALONG THE CAMEROON VOLCANIC LINE IN BAFMENG AREA, NW CAMEROON: CONSTRAINTS FROM STREAM SEDIMENTS GEOCHEMISTRY

[1,2*]TAKOJIO NGUEMO Rose Eugenie, [3]KOUANKAP NONO Gus Djibril, [3]WOTCHOKO Pierre, [2]OKOMO ATOUBA Lise Carole, [2]KANKEU Boniface, [2]BASSAHAK Jean, [2]HELL Joseph Victor, [4]CHENYI VOHNYUI Marie-Louise and [3]EKOUELLE BELLA Aroon Jules

[1*]Department of Earth Sciences, Faculty of Sciences, University of Yaoundé I, P.O.Box 812 Yaoundé, Cameroon
[2*]Institute for Geological and Mining Research, P.O. Box 4110; Yaoundé, Cameroon
[3]Department of Geology, HTTC, University of Bamenda, P.O. Box 39 Bambili; Bamenda, Cameroon
[4]Department of Earth Sciences, Faculty of Sciences, University of Dschang, P.O. Box 67 Dschang, Cameroon

ARTICLE INFO

Article History:
Received 19th March, 2017
Received in revised form
14th April, 2017
Accepted 26th May, 2017
Published online 30th June, 2017

Key Words:
Cameroon Volcanic Line,
Oku, Bafmeng,
Stream Sediment,
Mineralization.

***Corresponding author:**

ABSTRACT

Oku's stratovolcano to which Bafmeng area belongs to, is the second largest summit of the Cameroon Volcanic Line and it has ne ver been investigated regarding their mineral potential. Stream sediments geochemistry of the Bafmeng area were carrying out with the aim to elucidating the mineral potential of Mount Oku. The data obtained by Inductively Coupled Plasma Mass Spectrometry were statistically treated. Amongst major elements Fe, Al, Mn, Mg and Ti were the most representative and their highest values are 35.5%, 2.01%, 8.63%, 11.7%, 3.8% respectively. Base metal such as Cu, Zn, Sn have slightly high contents with their respective maximum values of 22.7ppm, 517ppm and 4ppm. Lithium has a contents ranging from 2.5ppm to 7.2ppm. A highest value of 950ppm was recorded for Ni, 426ppm for Cr and 76.7ppm for Co. Regarding the Rare Earth Elements, Ce and La were the most presents yielding the maximum contents of 500ppm and 150ppm respectively. Radioactive elements such as U, Th, Pb show very low contents. Stream sediments of Bafmeng area underwent little transportation and moderate chemical weathering. Little anthropogenic activities are carrying on in the localities, therefore enrichment of stream sediments in some elements are directly linked to the high contents of those elements in the country rocks, thus the follow up is recommend to define prospects in Bafmeng area.

Citation: TAKOJIO NGUEMO Rose Eugenie *et al.* 2017. "Contribution to mineral exploration along the Cameroon Volcanic Line in Bafmeng area, NW Cameroon: Constraints from stream sediments geochemistry", *International Journal of Development Research*, 7, (06), 13415-13421.

INTRODUCTION

The Cameroon Volcanic Line is a 1,600 km long chain of volcanoes trending N030°E. It includes islands in the Gulf of Guinea and mountains that extend along the border region of eastern Nigeria and western Cameroon, from Mount Cameroon in the South towards Lake Chad in the North (Burke 2001). The Cameroon Volcanic Line is known as a major structure in Central Africa. It is an alignment of oceanic and continental volcanic mountain and anorogenic plutonic complexes.

This megastructure extends on the continent by volcanic massives and more than sixty plutono-anorogenic complexes extending from Mount Koupé to Waza. The North Equatorial Pan-African Fold Belt, which is the substratum of the Cameroon Volcanic Line, is the result of the collision between the Congo-Sao Francisco craton and the West African craton (Toteu *et al*., 1987). In NW Cameroon, the panafrican formations are partially covered by volcanic lava. Bafmeng area which is the NW slope of Mount Oku, subject of our study belongs to these two great geological complexes, and there were, encountered various petrographic types of volcanic and plutonic. These magmatic units of Mount Oku have never been investigated regarding their mineral potential despite the fact that major mineral deposit are of magmatic origin. Assessing the stream sediments in Mount Oku can be useful to evaluate the potential of the area, thus contribute to mineral exploration within the Cameroon Volcanic Line.

GEOLOGICAL SETTING OF THE STUDY AREA

The Cameroon Volcanic Line is an alignment of N30°E of oceanic and continental volcanic massifs constituting thus the two sectors of this chain. The oceanic sector is entirely volcanic and consists of four islands (Bioko, Sao tomé, Principé and Annobon,) and two recently discovered large marine mountains (Burke, 2001) between bioko and principé, and between principé and sao tomé. The continental sector consists of the south to the north by the Mount Etindé, Cameroun, Manengouba, Bamboutos, Bamenda, Oku massifs Adamaoua / bui plateau and Mount Mandara (Fitton, 1980,1983,1987; Dunlop 1985, Halliday *et al*., 1998, Njilah, 1991, A. Marzolli *et al*.2000). Fitton (1983, 1987). The magmatic activity along this line started arround 65Ma (Njilah *et al*., 1991). Oku's stratovolcano is the second largest summit of the Cameroon Volcanic Line (3011m) after Mount Cameroon, it is formed of Nyos, Nkambe, Babanki, the volcanic district of Wum and Oku. Previous work carried out shows that Mount Oku first emitted basalts (31 ± 2 Ma 1 Ma: Gouhier *et al*., 1974, Dunlup, 1983, Njilah, 1991) followed by trachytes (22, 3Ma: Njilah, 1991), voluminous rhyolitic ignimbrites and lastly basaltic pyroclastics. Previous work show that lavas in the Oku massif range from basic lavas to acid lavas (trachytes and rhyolites). K-Ar Dating performed by Njilah (2004) gives the ages of the volcanic rocks of Mount Oku are 25Ma to Present, which permits to distinguish three volcanic series:

- The lower series ranging from 23 to 17.51 Ma, consisting of lava flows from the basic lavas and some fragments of the partially digested granite basement.
- The average series ranging from 17.51 to 14 Ma, includes the lava flows covered by trachytes and rhyolites intercalated by pyroclastic flows.
- The upper series ranging from 14 to 0.83 Ma constitutes the most recent phase, characterized by phreatic and phreatomagmatic eruptions forming the maars.

The Bafmeng area is situated on the western slope of Mount Oku in the North-West Region of Cameroon and extends between Latitude 6°19'26"N and 6°26'12"N and the Longitude 10°10'31"E and 10°17'30"E. It belongs to the Menchum hydrographic basin, it is drained by numerous streams and rivers (Tsoshishe, Mele and Nyi) which take their sources in the rhyolitic and trachytic domes of Mbolom, Emo and Isse. The mountains of this region are almost homogeneous and show a dendritic hydrographic network (Figure 1).

Sampling and Analytical methods

The stream sediments sampling method consisted of a walk in the stream channels, identification of an area of sediments deposition, and then digging of a hole on the channel to get to the old and almost consolidated gravel. After collecting the gravel in a pan, heavy mineral and black sand were obtained by panning, about 150 grammes were sampling at each point. A total of 11 stream sediments samples were collected from 11 different points within the hydrographic network.

The 11 stream sediments samples were sent to the commercial laboratory ALS (Australia Laboratory Services) to perform full elements geochemistry. There, the samples were first dried at 600°C, crushed and milled to fine powder. Five grams of each sample were then decomposed by aqua regia digestion in a graphite heating block. After cooling, the resulting solution was diluted with deionizer water, mixed and analyzed by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES) followed by Inductively Coupled Plasma Mass Spectrometry (ICP-MS). The analytical results were corrected for interelement spectral interferences.

Results and interpretation of stream sediments geochemistry

Eleven (11) samples of stream sediments were analyzed for multi elements. Full data are presented in Table 1.

Major Elements

Major elements analyzed are: Al, Ca, Fe, K, Mg, Mn, Na, P, Ti. They are presented in table 2 with their respective basic statistics. The basic statistics presented in Tables 2 show that the major preponderant elements present are iron, magnesium and manganese. Their concentrations range from 6.24% (EKC05) to 35.5% (EKC11), from 0.39 (EKC02) to 11.7% (EKC11) and from 0.687% (EKC03) to 8.63%, (EKC10) respectively. The other major elements have relatively low contents compared to the first three (Fe, Mg, Mn); Aluminum (Al) has a content in the range of 0.48% (EKC01) to 2.01% (EKC01). Their respective average concentrations are 17.90%, 4.17% 1.07%. Titanium at concentrations between 0.267% (EKC01) -3.8% (EKC05) and its average concentration is 0.79%. It should be noted that calcium (0.05-0.75%) and phosphorus (0.018-0, 134%) have very low contents in the EKC11 samples for their minima and in the EKC08 for their maximum with a mean concentrations of 0.38% and 0.11% respectively. Sodium and potassium, which have contents between (0.028-0.215%) and (0.04-0.21%) respectively, correspond to their maximum in EKC10 and their minimum in EKC05 (Table 1). Their respective average contents are 0.088% and 0.11%.

Iron abundance indicates a primary origin due to the alteration of country rocks rich in ferromagnesian minerals such as biotites, moscovites and amphiboles. The magnesium abundance in the concentrates reflects the ultramafic nature of some rocks in the area and could be derived from basalts rich in pyroxenes and olivines. Manganese is relatively abundant in stream sediments, as it is often found as an accessory mineral in olivine, pyroxene, and amphibole. Aluminum which has an average concentration of 1.07% could originate from aluminosilicate minerals such as feldspars (microcline, orthose, plagioclase) and muscovite from the Bafmeng granitic rocks. The presence of titanium could be related by its affinity with iron to form titanohematite compounds such as Ilmenite. The low levels of calcium, sodium and potassium in stream sediments show that the parent rocks, are less rich in certain feldspars such as Anorthite, Bytownite and Hyalophane. Figure 2 shows the distribution of these major elements as a function of their average contents (%) in the stream sediments.

Trace Elements

The various contents of all trace elements are presented in table 1. Gold (Au) contents are very low, ranging from 0.0002 to 0.001 ppm, the minimum is in the EKC05 samples and the maximum in the EKC01 sample.

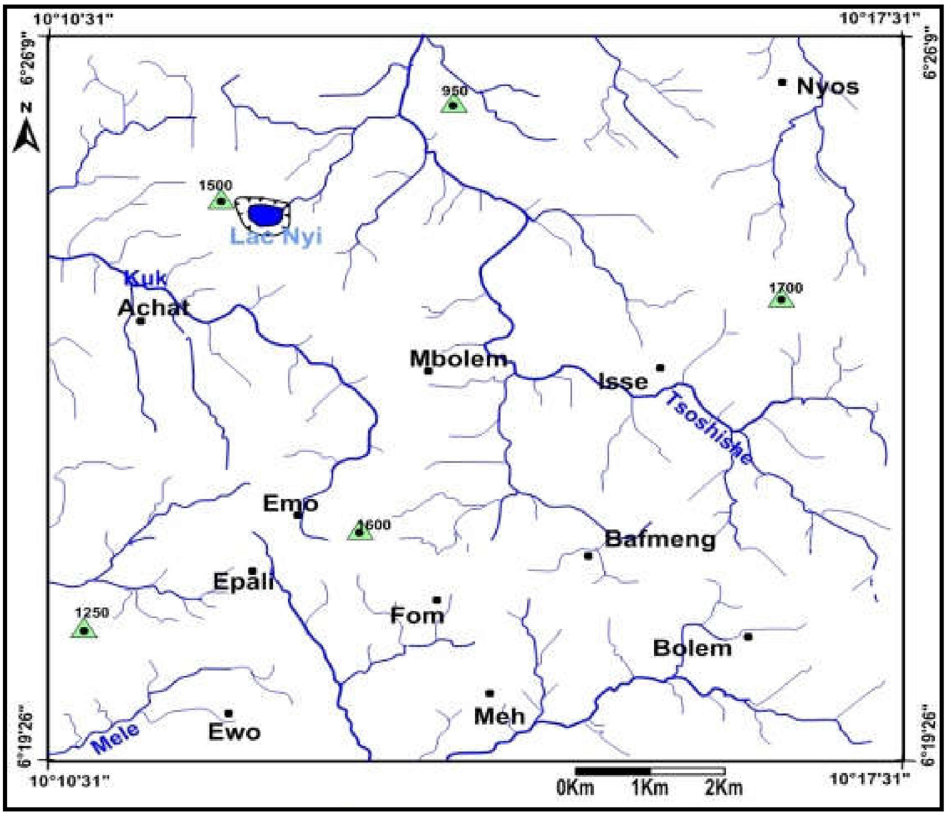

Figure 1. Hydrographic map of Bafmeng area (from NB-32-XVII-16NKAMBE 1b at 1/200 000)

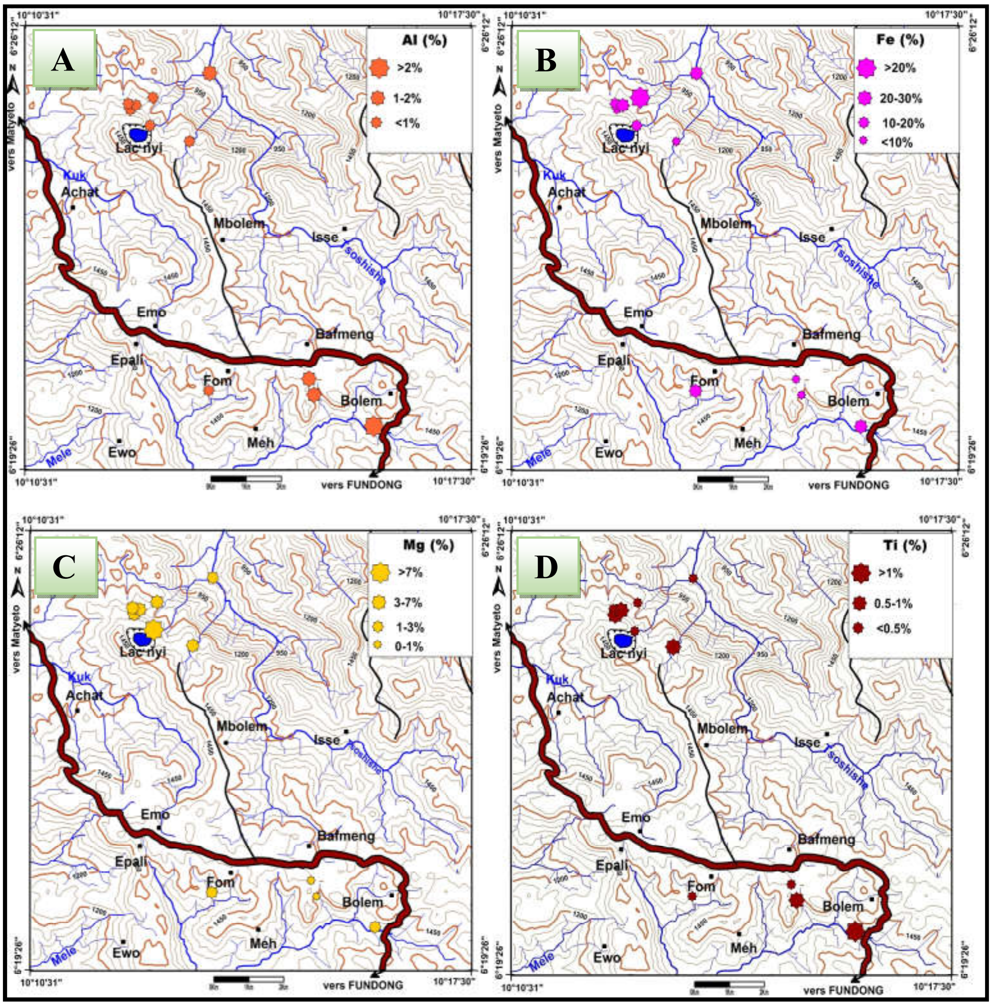

Figure 2: Geochemical graduated symbol plots map of some major elements: iron (A), aluminum (B), titanium (C), magnesium (D)

Table 1. Bafmeng stream sediments geochemistry data (in ppm)

Samples	EKC01	EKC02	EKC03	EKC04	EKC05	EKC06	EKC07	EKC08	EKC09	EKC10	EKC11
Au	0,001	0,0004	0,0003	0,0008	<0.0002	0,0004	<0.0002	0,0006	<0.0002	0,0005	0,0009
Ag	0,01	0,01	0,008	0,011	0,011	0,005	0,005	0,07	0,101	0,492	0,145
Al	20100	8900	8900	9600	4800	9800	9300	10400	9000	15700	11300
As	0,57	0,21	0,28	0,52	0,4	0,69	0,57	0,65	0,54	2,55	0,87
B	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ba	139	61,1	52,8	54,3	24,3	42,1	44,4	74,8	64,8	149,5	54,8
Be	1,41	0,37	0,4	0,49	0,23	0,49	0,41	0,83	0,79	2,99	1,35
Bi	0,032	0,06	0,051	1,155	0,103	0,123	0,262	0,476	1,22	0,036	1,145
Ca	4400	5600	3700	6200	2100	1800	2100	7500	7300	1100	500
Cd	0,138	0,039	0,037	0,049	0,034	0,034	0,032	0,073	0,072	1,115	0,268
Ce	123,5	80,3	74	132	253	183,5	268	108,5	113	>500	460
Co	62	76,7	50,3	54,5	57,7	29,1	37,7	35,3	41,9	8,82	9,08
Cr	281	206	150	266	163	132,5	155	103	108,5	142	426
Cs	0,231	0,172	0,247	0,204	0,155	0,247	0,238	0,448	0,412	0,236	0,322
Cu	9,17	8,13	7,31	8,34	7,06	4,97	5,34	18,2	22,7	5,1	7,93
Fe	222000	131500	144000	268000	355000	80800	93400	265000	264000	83300	62400
Ga	26	8,52	11,35	20,8	32,9	8,88	10,5	25	23,4	21,2	14,15
Ge	0,339	0,258	0,251	0,42	0,576	0,327	0,398	0,412	0,398	0,404	0,212
Hf	2,41	0,474	0,483	2,56	0,363	0,531	1,02	0,663	0,758	3,72	2,87
Hg	0,027	0,005	0,008	0,009	0,013	0,017	0,021	0,011	0,01	0,02	0,016
In	0,153	0,027	0,024	0,029	0,018	0,022	0,032	0,032	0,032	0,057	0,048
K	500	1200	1300	1500	400	1000	1100	1300	1100	2100	1200
La	56,2	40,9	36,4	65	133	115	133	53,3	54,2	150	59,7
Li	6	3,8	3,6	3,4	2,8	3,9	4	7,2	6,2	2,5	3,4
Mg	21100	117000	70900	63300	64700	432000	45900	11300	12900	5400	3900
Mn	21300	9520	6470	9210	7490	6700	7210	8360	8170	86300	26900
Mo	1,56	0,52	0,49	0,75	0,37	0,9	0,8	0,9	0,93	4,98	2,08
Na	480	1060	840	1130	280	470	540	750	670	2150	1400
Nb	5,68	0,627	1,315	1,745	0,737	2,79	3,64	1,235	1,07	7,78	7,93
Ni	106	950	604	564	603	372	391	80,2	101	38,4	26,8
P	790	540	480	540	390	380	370	1340	1260	250	180
Pb	8,58	5,29	2,33	3,46	3,84	3,81	5,19	6,2	6,37	64,8	24,8
Pd	<0.001	0,001	<0.001	0,001	0,002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pt	0,004	0,002	<0.002	0,005	<0.002	<0.002	0,002	<0.002	<0.002	0,006	0,005
Rb	4,75	6,39	9,97	7,83	3,3	6,21	6,96	7,14	5,83	7,02	5,52
Re	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
S	10	10	10	10	<10	<10	10	60	80	10	10
Sb	0,064	0,029	0,022	0,028	0,01	0,036	0,028	0,023	0,023	0,269	0,148
Sc	14,65	6,63	4,69	6,93	4,24	5,14	5,39	7,17	6,92	2,79	2,78
Se	1,4	0,7	0,6	1,1	1,1	1,3	1,5	1,1	1,1	1,1	0,7
Sn	3,17	2,04	2,36	4,67	2,13	1,97	2,56	3,43	3,42	3,41	3,01
Sr	34,2	36,4	23	26,6	17	9,98	11,55	45,5	42,2	17,1	6,14
Ta	0,264	0,014	0,023	0,046	0,018	0,101	0,132	0,096	0,049	0,091	0,06
Te	<0.01	0,01	<0.01	<0.01	0,01	<0.01	0,01	<0.01	0,02	<0.01	<0.01
Th	6,53	16,95	15,2	29,7	54	49,1	64,5	30,9	32,3	13,9	11,85
Ti	38000	4570	3470	5800	2670	5930	8300	3680	3450	4910	7060
Tl	0,071	0,027	0,039	0,037	0,012	0,038	0,037	0,04	0,036	3,57	0,969
U	3,39	2,36	2,45	3,92	6,3	5,31	7,94	6,12	5,5	2,95	4,64
V	442	175	215	448	545	114	170,5	562	571	87,9	95,3
W	0,017	0,892	0,552	0,644	1,715	0,089	0,12	6,08	0,64	1,695	0,253
Y	21,3	15,9	13,6	27,4	21,1	20,7	30,3	23,2	22,8	23,5	13,95
Zn	517	114	67	69,5	69,2	52,5	75,6	68,2	63,1	141,5	128,5
Zr	118,5	28,2	32,3	152	18,85	28,9	50,1	35,8	33,5	266	167,5

Table 2. Basic statistic of Major elements from stream sediments of Bafmeng area

Samples	Al	Ca	Fe	K	Mg	Mn	Na	P	Ti
EKC01	2,01	0,44	22,2	0,05	2,11	2,13	0,048	0,079	3,8
EKC02	0,89	0,56	13,15	0,12	11,7	0,952	0,106	0,054	0,457
EKC03	0,89	0,37	14,4	0,13	7,09	0,647	0,084	0,048	0,347
EKC04	0,96	0,62	26,8	0,15	6,33	0,921	0,113	0,054	0,58
EKC05	0,48	0,21	35,5	0,04	6,47	0,749	0,028	0,039	0,267
EKC06	0,98	0,18	8,08	0,1	4,32	0,67	0,047	0,038	0,593
EKC07	0,93	0,21	9,34	0,11	4,59	0,721	0,054	0,037	0,83
EKC08	1,04	0,75	26,5	0,13	1,13	0,836	0,075	0,134	0,368
EKC09	0,9	0,73	26,4	0,11	1,29	0,817	0,067	0,126	0,345
EKC10	1,57	0,11	8,33	0,21	0,54	8,63	0,215	0,025	0,491
EKC11	1,13	0,05	6,24	0,12	0,39	2,69	0,14	0,018	0,706
Minimum	0,48	0,05	6,24	0,04	0,39	0,647	0,028	0,018	0,267
Maximum	2,01	0,75	35,5	0,21	11,7	8,63	0,215	0,134	3,8
Mean	1,0709	0,3845	17,9036	0,1155	4,1782	1,7966	0,0888	0,0593	0,7985
STD	0,4023	0,2700	10,8503	0,0506	3,9653	2,9085	0,0616	0,0426	0,9304

Tableau 3: Basic statistic of some selected trace elements from Stream Sediments of Bafmeng

Samples	Ce	La	Pb	Th	U	Zr	Se	Sr
EKC01	123,5	56,2	8,58	6,53	3,39	118,5	1,4	34,2
EKC02	80,3	40,9	5,29	16,95	2,36	28,2	0,7	36,4
EKC03	74	36,4	2,33	15,2	2,45	32,3	0,6	23
EKC04	132	65	3,46	29,7	3,92	152	1,1	26,6
EKC05	253	133	3,84	54	6,3	18,85	1,1	17
EKC06	183,5	115	3,81	49,1	5,31	28,9	1,3	9,98
EKC07	268	133	5,19	64,5	7,94	50,1	1,5	11,55
EKC08	108,5	53,3	6,2	30,9	6,12	35,8	1,1	45,5
EKC09	113	54,2	6,37	32,3	5,5	33,5	1,1	42,2
EKC10	500	150	64,8	13,9	2,95	266	1,1	17,1
EKC11	460	59,7	24,8	11,85	4,64	167,5	0,7	6,14
Mean	208,70	81,51	12,24	29,53	4,62	84,69	1,06	24,5
minimum	74	36,4	2,33	6,53	2,36	18,85	0,6	6,14
maximum	500	150	64,8	64,5	7,94	266	1,5	45,5
STD	148,69	42,10	18,49	19,14	1,78	80,61	0,29	13,50

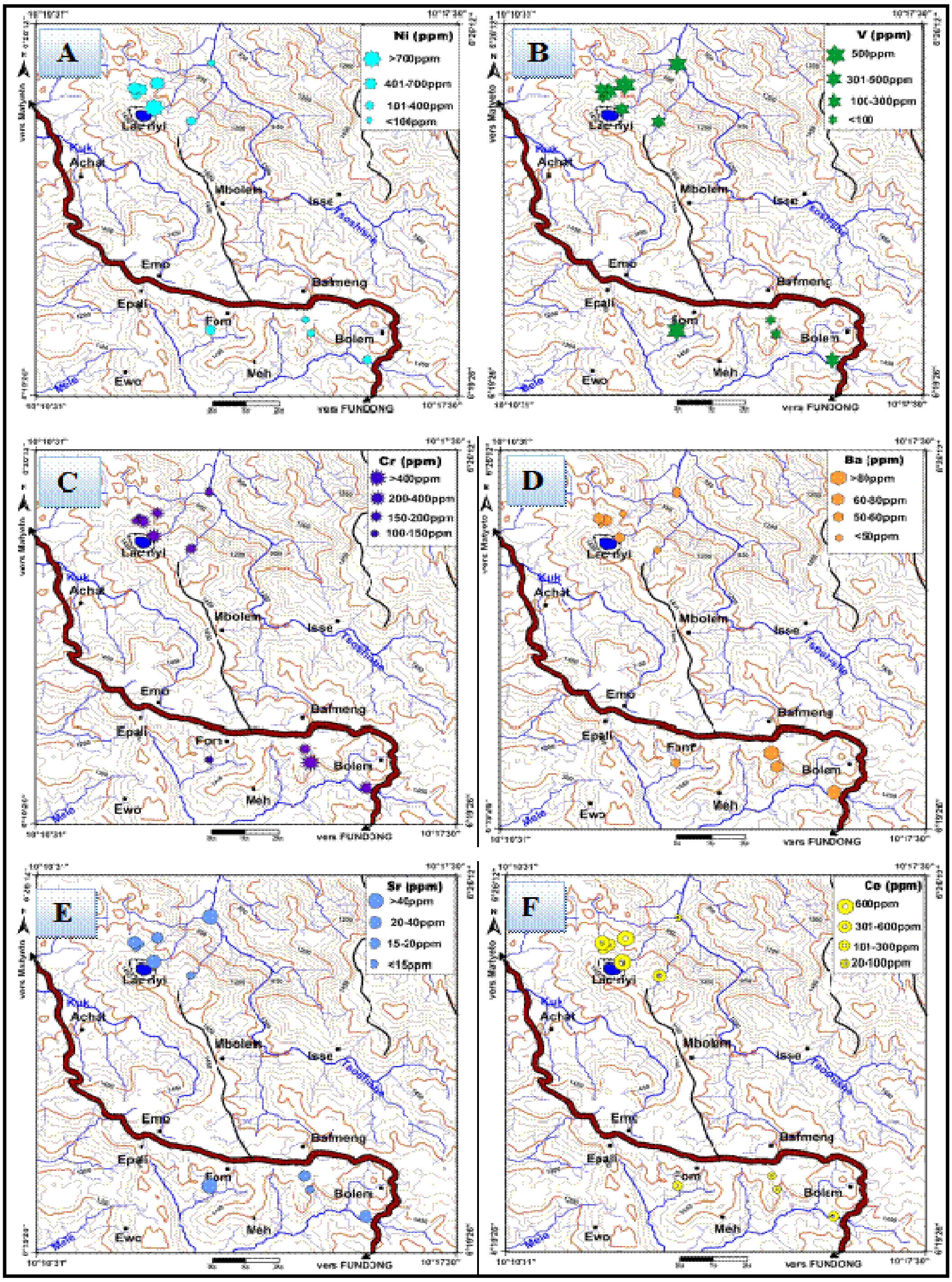

Figure 17: Geochemical graduated symbol plots map of some trace elements: Ni (A), V (B), Ce (C), Sr(D), B (E), Cr (F)

For silver (Ag), the stream sediments have contents in the range of 0.005 ppm (EKC10) to 0.492 ppm (EKC06). The base metals such as copper (Cu), tin (Sn), and zinc (Zn) have slightly higher contents. The zinc contents are remarkable, ranging from 52.5 ppm (EKC01) to 517 ppm (EKC06). Copper has a concentration ranging from 22.7 ppm (EKC09) to 4.97 ppm in (EKC06). Tin, for its part, has contents of the order of 1.97 ppm (EKC04) at 4.67 ppm (EKC06). Lithium (Li), which is a light metal with high demand today, has significant contents ranging from 2.5ppm (EKC10) to 7.2 ppm (EKC08). Hafnium has concentrations ranging from 0.36 to 3.72 ppm. Ferrous metals have very high concentrations. Nickel (Ni) has concentrations of 26.8 to 950 ppm. It is strongly present in the EKC02 sample and low in the EKC11 sample. The stream sediments also have good contents of 87.9 ppm (EKC10) and 571 ppm (EKC09) of vanadium (V). Chromium (Cr) is distinguished in ferrous metals with contents of the range of 103 ppm (EKC08) to 426 ppm (EKC11). Cobalt has a minimum of 8.82 ppm in (EKC10) and a maximum of 76.7 ppm (EKC08).

The elements of the platinum group are present but at relatively low concentrations. Platinum has concentrations in the range of 0.002 to 0.006 ppm, with the maximum recorded in the EKC10 sample and the minimum in the majority of samples. Palladium has concentrations of less than 0.1 ppm in all samples except EKC06 (0.2 ppm). Rhenium (Re) has concentrations of less than 0.001 ppm in all samples (Table 1). Stream Sediments have significant concentrations of light rare earths (Ce and La). The maximum concentrations of cerium (500 ppm) and lanthanum (150 ppm) are recorded in the same sample, EKC10 and their respective minimum concentrations of 74 and 36.4 ppm are recorded in the EKC03 sample. For the radioactive elements, zirconium is the most abundant element, its content varies between 18, 85 and 266 ppm contained respectively in EKC04 and EKC10. In terms of abundance, zirconium is followed by thorium (Th), which has concentrations in the range of 6.53 ppm (EKC01) to 64.5 ppm (EKC07). Lead (Pb) has moderate concentrations ranging from 2.33 ppm (EKC03) to 64.8 ppm (EKC10), uranium (U), with the least representative levels ranging from 2.36 ppm (EKC02) to 7.94 ppm (EKC07).

In the stream sediments of Bafmeng area, the most significant trace elements are Nickel, Vanadium, Zinc and Chromium with a mean average content of 348.76 ppm, 311.42 ppm, 124.19 ppm and 193.90 ppm high enough to Interest. The abundance of nickel in the samples, particularly the one arround Lake Nyi (950 ppm), can be explained by the fact that nickel is generally formed in ultrabasic rocks or peridotites. The crater at the origin of Lake Nyi, during its formation, emitted enormous quantities of ultrabasic rocks (peridotites) which altered and enriched the stream sediments with nickel. It could also come from sulfurous minerals such as millerite. Nickel is generally accompanied by other metals such as Cobalt and Copper, which are also abundant in stream sediments of Bafmeng area. The presence of chromium in large quantities is justified by the fact that it is also formed in peridotites and often in small quantities in silicates such as muscovite and pyroxene present in the volcanic and plutonic rocks of the region (Basalts and rhyolites). The zinc content could be justified by the presence of minerals rich in zinc sulphide such as blende. The high Cr, Ni, V contents with Mn are indicative of mafic rocks. Cerium, lanthanum are abundant in stream sediments, indicating that our region is rich in light rare earths and could be derived from heavy minerals such as bastnaesite and monazite. The direct observation of the gravels from the sampling points of the various stream sediments samples reveals sub-rounded to angular fragments of millimetric, centimetric to decimetric size. These gravels also contained fragments of feldspars and muscovite flakes which are less resistant to weathering. This indicates that these stream sediments have undergone short transport with low hydrodynamics energy and are closed to their sources. Based on the fact that little antropogenic activities are recorded in the localities, all metal observed in the stream sediments are directly related to the weathering of the country rocks of the locality of Bafmeng.

GENERAL CONCLUSION

Bafmeng area which is the NW flanc of Mount Oku is made up petrographically of Granite, Trachyte and Basalte. To elucidating its mineralization potential, major and traces elements concentration were measured from 11 stream sediments samples. Amongst major elements Fe, Al, Mn, Mg and Ti were the most representative and their highest values are 35.5%, 2.01%, 8.63%, 11.7%, 3.8% respectively. Gold (Au) contents are very low, ranging from 0.0002 to 0.001ppm, Silver (Ag) contents range from 0.005ppm to 0.492ppm. The Zinc contents are remarkable, ranging from 52.5ppm to 517ppm. Copper has a concentration ranging from 22.7ppm to 4.97ppm. Lithium (Li), which is a light metal with high demand today, has significant contents ranging from 2.5ppm to 7.2ppm. Nickel (Ni) has concentrations of 26.8 to 950ppm. Chromium (Cr) is distinguished in ferrous metals with contents of the range of 103ppm to 426ppm. Cobalt has a minimum of 8.82ppm and a maximum of 76.7ppm. The elements of the platinum group are present but at relatively low concentrations. Platinum has concentrations in the range of 0.002 to 0.006ppm. Palladium has concentrations of less than 0.1ppm in all samples. Stream Sediments have significant concentrations of light rare earths (Ce and La). The maximum concentrations of cerium (500ppm) and lanthanum (150ppm) are recorded. Lead (Pb) has moderate concentrations ranging from 2.33ppm to 64.8ppm, Uranium (U), with the least representative levels ranging from 2.36ppm to 7.94ppm. Based on the fact that little anthropogenic activities are carrying on in the localities, the enrichment of stream sediments in some elements are directly linked to the high contents of those elements in the country rocks, thus the follow up is recommend to concise and define prospects in Bafmeng area.

REFERENCES

Burke K, 2001. Origin of the Cameroon Line of volcano-capped swells. Journal of Geology 109, 349–362.

Dunlop, MH, 1983. Strontium isotope geochemistry and potassium-argon studies on volcanic rocks from the Cameroon Line,West Africa. PhD. Thesis. University of Edinburgh,160p-347.

Fitton JG, Dunlop HM, 1985. The Cameroon Line, West-Africa, and its bearing on the origin of Oceanic and Continental alkali basalt. Earth and Planetary Science Letters 72, 23–38.

Fitton JG, 1987. The Cameroon Line, West Africa: a comparison between oceanic and continental alkaline volcanism. Alkali Igneous Rocks. *Geological Society Special publication* No.30, pp 273-291.

Gouhier J, Nougier D, 1974. Contribution à l'étude volcanologique du Cameroun (ligne du Cameroun – Adamaoua).ann.fac.sci.cam.17,3-48.

Halliday AN, Dickin AP, Fallick AE, and Fitton JG, 1988. Mantle Dynamics: A Nd, Sr, Pb,and O Isotopic study of the Cameroon Line Volcanic Chain *J. Petrol.* 29, 181-211.

Lissom J. 1991. Etude pétrologique des laves alcalines du massif d'Oku: un ensemble volcanique de la "ligne du Cameroun". Th. Univ. Paris VI, Paris, p.207.

Marzoli A, Piccirillo EM, Renne PR, Bellieni G, Iacumin M, Nyobe JB, Tongwa AT, 2000. The Cameroon volcanic line revisited: petrogenesis of continental basaltic magmas from lithospheric and asthenospheric mantle source. J. Petrol. 41, 87–109

Njilah IK 1991. Geochemistry and Petrogenesis of Tertiary-Quaternary Volcanic Rocks from Oku-Ndu Area, N.W. Cameroon. *(Unpublished Ph.D. Thesis,University of Leeds).* 345pp.

Njilhah IK, Ajonina HN, Kamgang KV, Tchindjang M, 2004. K-Ar ages, mineralogy, major and trace element geochemistry of the tertiary-quaternary laves from the Ndu volcanic ridge N.W Cameroon. Africa Journal of Science and Technology (AJST).Science and Engineering Series Vol.5, No, pp.47-56

Toteu SF, Penaye J, Poudjom Djomani YH, 2004. Geodynamic evolution of the Pan-African belt in central Africa with special reference to Cameroon: Canadian Journal of Earth Sciences 41, 73–85.

****