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Mineralogical and Radiometrical studies of Gabal El-Dob area, Central Eastern Desert, Egypt

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ABSTRACT

Gabal El-Dob area is located in the Central Eastern Desert and covering an area of about 1800 km^2. It is dissected by two wadis, the first one is Wadi Fatirah El-Beidah which located at the northern part of the area and the second one is Wadi Abu Zawal which located at the southern part of the area. The exposed rock types in the area comprise older granites and younger granites which represented by perthite granite and reibeckite leucogranite as well as several types of post granite dikes. The identified heavy mineral assemblages can be classified into two main groups: The first group is the opaque iron minerals as; Magnetite, Hematite, Goethite, Pyrite and Thorianite while the second group is non-opaque minerals include: Garnet, Rutile, Zircon, Sphene, Fluorite, Chalcocite and Atacamite. The average eU, eTh, Ra, and K% has 90, 232, 64ppm and 0.75% respectively for hard samples and 14, 23, 3ppm and 1.05% respectively, for the stream sediments.

Key words: Gabal El-Dob, North Eastern Desert, older and younger granite

Introduction

Gabal El-Dob area is located in the northern part of the Central Eastern Desert and covering an area of about 1800 km^2 Fig. (1), the area is characterized by rugged topography with moderate to high relief and very arid climate. It is intersected by two wadis, the first one is Wadi Fatirah El-Beidah which located at the north of the area and the second one is Wadi Abu Zawal which located at the south of the area. The exposed rock unites in the area comprise older granites, perthite granite and reibeckite leucogranite as well as several types of post granite dikes. The present work is concerned with mineralogy and radiometry in stream sediments around Gabal El-Dob area, as well as in some parts of Wadi Fatirah El-Beidah and Wadi Abu Zawal closely.

Geological setting:

The area is occupied by igneous rocks belonging to late Proterozoic age and lies between lat. 26° 41´ and 26° 45´ N and long. 33° 22´ and 33° 25´ E Fig. (1). The area is classified into: (1) Granodiorites (oldest), (2) Dokhan Volcanics, (3) Younger Gabbros, (4) Alkali Feldspar Granites, (5) Acidic and Basic Dykes (youngest). The micro-fractures of these rocks are sometimes filled with quartz and feldspar veinlets.

- Granodiorites:

They represent the older rocks in the area under investigation covering a total area of about 10%. The granodiorites are encountered in the northeastern and north-central parts of the mapped area Fig. (1). They are characterized by the general low topography, the boulder appearance especially in Wadi Abu Zawal directly northeast Gabal El-Dob, the cavernous weathering especially in Wadi Fatirah El-Beidah and the characteristic exfoliation and monumental shapes.

They are medium-to coarse-grained containing numerous amounts of mafic minerals. It is intruded by the alkali feldspar granites with sharp contacts (Asran *et al.,* 2001). The color of the granodiorite becomes lighter due to quartz injection near the contact with the alkali feldspar granites where most of the fractures and joints are stained with limonitic iron oxides. The granodiorites are

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dissected by several dykes of different composition that vary from mafic to felsic and have different thickness and attitudes. The rock is composed mainly of plagioclase with subordinate amounts of the rock is composed mainly of plagioclase with subordinate amounts of texture. Plagioclase represents the main constituent (about 52% of the rock) occurring as euhedral crystals.

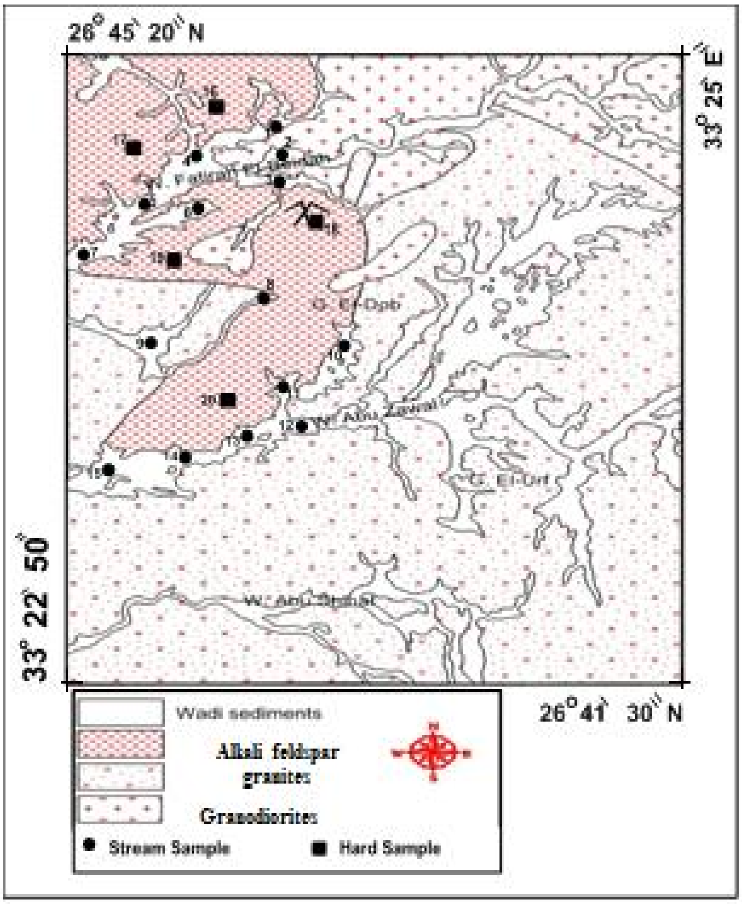


Fig. 1 : Geological map of Gabal El-Dob area with samples locations.
(After Ibrahim *et al.,* 1996).

The mineralized quartz veins are found in association with a variety of granodiorites that the quartz-casseterite-wolframite veins are confined only to the margins of the granite masses and the adjacent parts of the country rocks (El Shazly, 1957; Hassan et al., 1987; Takla and Nowier, 1980). Dokhan volcanics occupy moderate to high relief terrains in the northwestern and southwestern parts of the area. They comprise andesites, porphyritic rhyodacites and rhyolites. Younger gabbros crop out along Wadi Abu Zawal as homogeneous pockets, they from terrains of low to moderate relief and they are intruded into the older granites.

- Alkali Feldspar Granites:

These granitic rocks are characterized by blocky appearance and absence of exfoliation and cavernous weathering and are represented by Alkali feldspar granites, which crop out in the central part of the studied area they represent the last phase of the younger granites forming El –Dob. They are characterized by yellowish pink color and high relief forming small plates with oval to circular outlines intruding the granodiorites, Fig.(1). Gabal El-Dob granitic masses are cropping out as high topographic elliptical to semi-rounded masses of alkali feldspar granites and intruded into the surrounded rock units. All the alkali feldspar granites are dissected by several types of dykes from mafic to felsic of different attitudes. These dykes vary in thickness from few centimeters to more than 5 m, and cut by micro-pegmatitic feldspathic and quartz veins.

Pegmatites hosting copper, lead, and zinc minerals occur close to the marginal zone of G. EL-Dob. These minerals are almost found confined to the feldspar envelopes close to their boundary with the quartz core or closely associated with mica aggregates. Pegmatites are of variable size and their trend being almost parallel to the contact zone. Dimensions up to 400 m long and 10 m width are recorded. All these pegmatites are of granitic composition and characterized by compositional heterogeneity and zoning. Pegmatites are formed of an outer zone of blocky feldspars with subordinate biotite clusters that envelope an inner core of massive quartz; which occasionally exists as disconnected pods. The pegmatite described above contains low- albite which is characteristics of plutonic rocks and may be precipitated from hydrothermal solutions during post-magmatic processes. The presence of the (U, Th) bearing and other associated minerals in these pegmatites may suggest the following genesis for the development of the studied radioactive mineralization.

Structural Setting

Faults:

The tectonic pattern of the basement rocks of the study area is the result of combined effect of successive earth movements and is essentially polycyclic that took place since the Precambrian time, which produced various structural elements as:

- Transverse Faults: They trend in ENE to NE direction, normal to the Red Sea general axis. They are displaced horizontally by the second group of relatively younger faults. Their major faults are those which traverse the area south of Gabal Monqul, Gabal Dara and along W. Dib.
- Longitudinal Faults: They include all faults having NNW to NW trends. The major faults of this group are those which bound the uplifted blocks of Zeit Range, Esh El Mallaha Range and the Red Sea hills from the east. They are step faults with their down-throws toward the N-E; the Tertiary marine sediments are preserved on the down- thrown sides of these faults.

Dykes:

Post-Granit Dykes:

These dykes tend to be more concentrated in areas covered by older and younger granites or around such areas. They vary greatly in thickness from few cm up to more than 10 cm. They are generally rectinear and have parallel walls. They are either vertical or steeply inclined (El-Gaby, 1990), and includes:

a) Acidic Dykes: these dykes from the oldest group of post-granite dykes. They include micro-granites, micro-granodiorites, aplites, felsites, granoporphyrites, quartz-porphtites and dacites. They are usually of light yellow, pink and greyish color.
b) Intermediate Dykes: These dykes together with the acidic ones are the most abundant in the area and include andesites and microdiorites. These varieties are dark color, varying from green to black.
c) Basic Dykes: These dykes are the least common ones in the present area, which are represented by dolerites and basalts. They are dark grey to black in color.

Methodology

Fifteen channel samples were collected from the area around G. El Dob from pore holes having about 50cm diameter, and 0.80-1m depth, with intervals ranging from 0.5 to 1km Fig. (1). The average weight of each sample is about 10kg. The air-dried original sample was sieved using 2 mm screen. The obtained fraction less than 2mm was quartered using June’s splitters of different chutes down to about 250 gm. The hard rock in the area covered by (5) samples of younger granite (perthite leucogranite and reibeckite granite). The hard rock samples were prepared for mineral separation by crushing into 60 mesh. A representative sub-sample weighting about 60 gm was taken from each prepared samples by quartering for mineral separation. Separation was conducted using bromoform (Sp. Gr. 2.86g/cm^3). The magnetite separation carried out using a small hand magnet with suitable strength. The magnetite free heavy minerals assemblage were magnetically fractionated using the laboratory Frantz Isodynamic Magnetic Separator (Model L-1) at side slope of 5°, forward slope of 20° (Flinter,1955), and magnetic fractionation using a Frantz Isodynamic Magnetic Separator (Model L-1). The obtained fractions were carefully studied using the Binocular Stereomicroscope. In the present study, the collected 20 stream sediment, and hard rocks samples were analyzed for some trace elements. The elements were determined by XRF techniques on pressed powder pellets. Semiquantitative EDX chemical analyses were carried out using a Phillips XL-30 Environmental Scanning Electron Microscope (ESEM).The cylindrical plastic containers, of volume 212.6 cm^3, 9.5 cm average diameter, and 3 cm length. Then the container was filled with 300–400 gm of the samples, tightly sealed, and left for 30 days to accumulate free radon and attain radioactive equilibrium.

The four standards eU ppm, eTh ppm, Ra ppm, and K% were measured twice, 1000 seconds for each; the average of gross counts was taken, then divided by their net weight, and introduced to a computer program (Matolin, 1990), which runs under Ms-Dos to be used as a matrix of sensitivities represented as the concentrations of eU, eTh, Ra and K%. These concentrations are used as a reference for the studied samples. The latter were measured in the same way by means of the computer program which gives out the concentrations of eU and eTh in ppm.


(a)


(b)


(c)

Fig. 2: Shows

(a) General view of Gabal El Dob.
(b) Cavernous weathering in granodiorites.
(c) Alkali feldspar granites dissected by dykes.

Mineralogical Investigations

The magnetite separation carried out using a small hand magnet with suitable strength Table (1). The magnetite free heavy minerals assemblages were magnetically fractionated using the laboratory Frantz Isodynamic Magnetic Separator (Model L-1).
The identified heavy mineral assemblages studied under a Binocular Stereomicroscope in the studied area can be classified into two main groups according to Folk (1980). The first group is the opaque iron minerals as; Magnetite, Hematite, Goethite and Pyrite. The second group is non-opaque minerals includes Garnet, Rutile, Zircon, Sphene, Fluorite, Chalcocite, Atacamite, Biotite, Cupper minerals,

Mn minerals and Green Silicates. The most important heavy minerals will be described in the following paragraphs:

The First Group

-Magnetite (Fe3 O4)

Magnetite displays black to deep reddish brown color, with metallic to dull luster. Their habit ranges from massive, granular, angular to sub-angular and the octahedral crystals of magnetite are more frequent Fig. (3a).

- Hematite (Fe2O3)

Hematite is the principle ore of iron which originated mainly from of magnetite alteration processes and alteration product of many Fe-bearing minerals especially pyrite and so called hematite after pyrite (goethite) or pseudomorphic pyrite. The non-crystalline forms of hematite are supposedly transformations of the mineral limonite. Hematite occurs as a reddish brown to black color, angular to sub-angular Fig. (3b) with metallic or dull in earthy.

Table 1: Percentages of heavy and light bromoform of Gabal El-Dob.

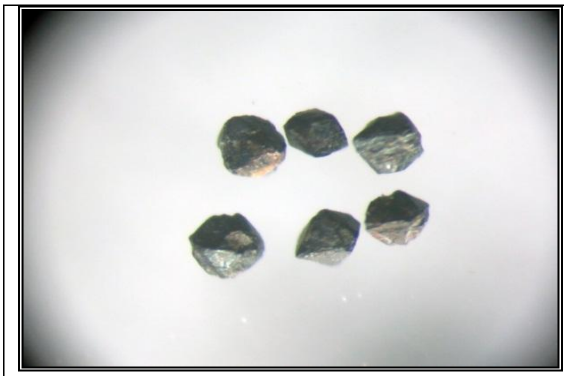
Samples Types	Sample No.	Total Heavy Minerals (Wt %)	Magnetite %	0.2amp Mag.	0.5amp Mag.%	1.5amp Mag.%	1.5amp Non-Mag.%
Stream Sediments	1	1.9	0.181	0.43	1.03	0.126	0.136
	2	1.76	0.143	0.368	1.037	0.20	0.02
	3	1.78	0.117	0.38	1.111	0.159	0.016
	4	3.06	0.178	1.376	1.36	0.138	0.013
	5	3.99	0.385	0.873	2.267	0.419	0.046
	6	4.18	0.380	1.33	1.684	0.682	0.107
	7	5.57	0.376	1.10	3.557	0.462	0.085
	8	6.389	0.361	2.53	3.08	0.1	0.318
	9	6.103	0.756	2.51	1.8	0.7	0.334
	10	7.48	0.51	3.89	2.97	0.085	0.029
	11	3.78	0.478	1.545	1.35	0.04	0.367
	12	2.99	0.343	1.25	1.16	0.218	0.019
	13	4.37	0.559	0.963	2.368	0.342	0.142
	14	6.42	0.482	3.63	1.57	0.626	0.112
	15	5.65	0.436	2.089	2.127	0.823	0.184
Hard Rocks	16	3.1	0.2	1.5	1.1	0.2	0.1
	17	3.58	0.18	1.3	1.1	0.6	0.4
	18	4.95	0.35	2.4	1.2	0.7	0.3
	19	4.16	0.41	1.75	1.5	0.3	0.2
	20	4.62	0.32	2.1	1.6	0.4	0.2

Goethite [FeO (OH)]

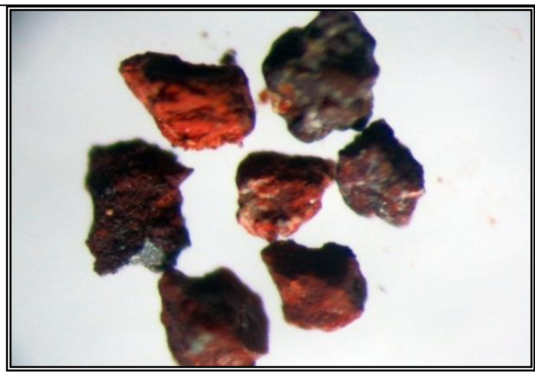
Goethite is hydrated iron oxide and considers an important ore of iron and pigment. It often forms through the weathering of other iron-rich minerals. It may also be formed as a primary mineral in hydrothermal deposits. Their color varies from yellow, brown, brownish red to black. Pure goethite grains were investigated under the Environmental Scanning Electronic Microscope (ESEM) which shown in Fig. (3c).

- Pyrite (FeS2)

It is a common sulphide mineral together with chalcopyrite. It has well developed cubic shape with angular faces and subhedral grains with sharp edges. It exhibits golden yellow or shiny brassy yellow color with metallic luster Fig. (4a). Pyrite was separated at magnetic field strength 1.5 ampere using the Frantz Isodynamic separator. The pyrite grains were investigated under the Environmental Scanning Electronic Microscope (ESEM) Fig. (4b).



(a)



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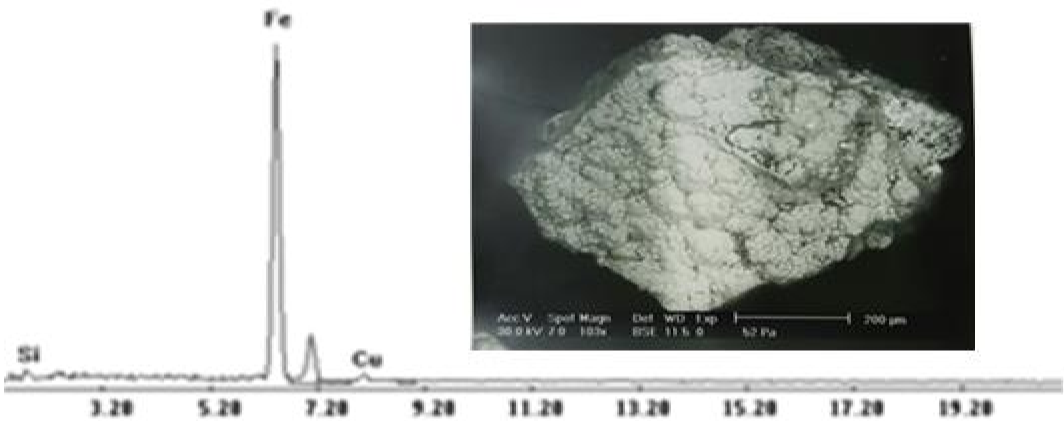


(c)

Fig. 3: Shows
(a) Euhedral magnetite grains,(X 18).
(b) Angular to subangular, reddish brown to black color Hematite, (X22.5).
(c) EDX and BSE image of Geothite.

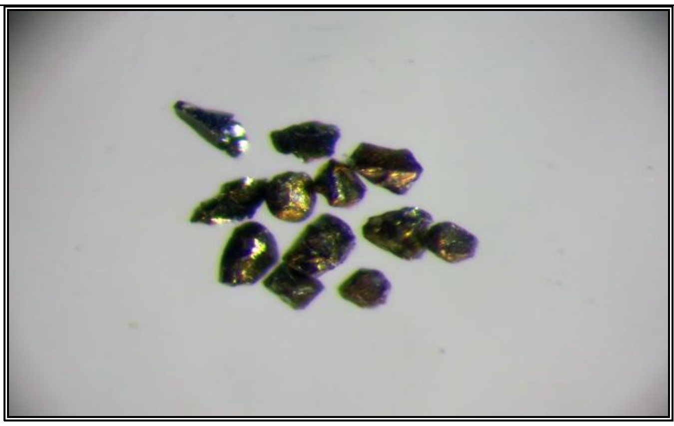
The Second Group

- Garnet [$Fe_3Al_2 (SiO_4)_3$]

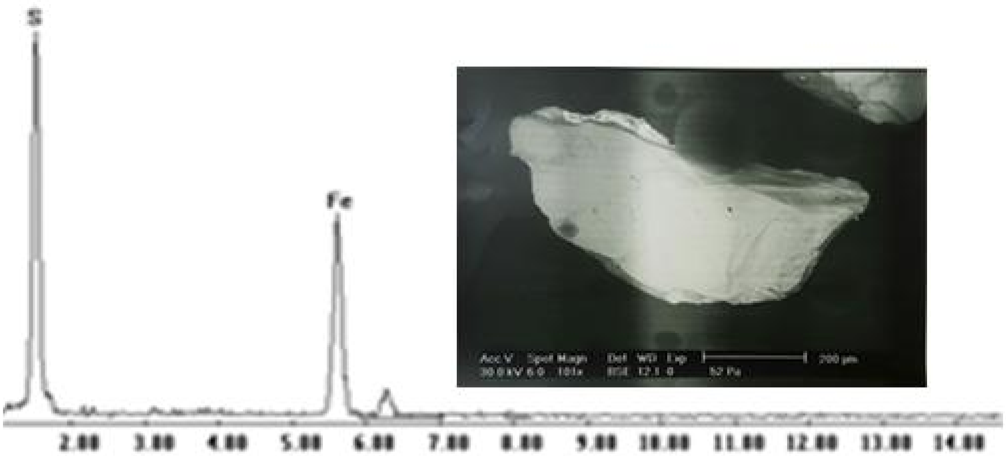
Garnet is not an individual mineral but a group of minerals closely related in physical and chemical properties. The minerals of garnet group characterize some metamorphic rocks, others occur in high-pressure igneous rocks. It was recorded in the studied samples as euhedral to subhedral colorless grains with sharp edges Fig. (5). Garnet was separated at magnetic field strength 0.2 ampere and 0.5 ampere using the Frantz Isodynamic separator.

- Rutile: (TiO2)

It considers a major ore of titanium. Rutile grains are subhedral to anhedral prismatic, rounded grains, varies is color from reddish brown to opaque Fig. (6). The majority of rutile grains were separated at magnetic field strength of 1.5ampere and the rest of rutile were founded in nonmagnetic 1.5ampere fraction using the Frantz Isodynamic Separator. The opaque variety is frequent in the highly magnetic while yellowish and reddish (translucent) rutile increase in the nonmagnetic fraction.



(a)



(b)

Fig. 4: Shows
(a) Photomicrograph under of cubic shape and subhedral grains of pyrite, X30.
(b) EDX and BSE image of Pyrite.

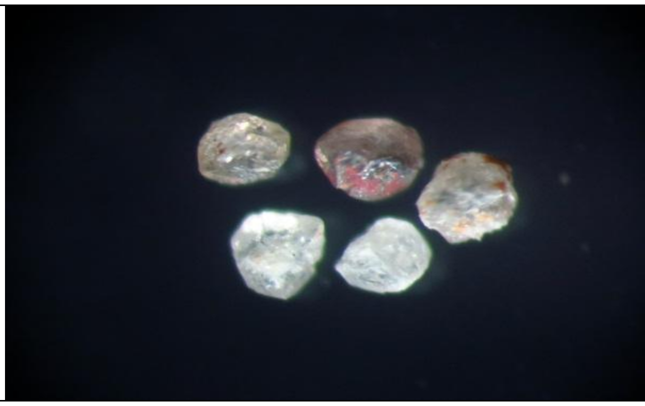


Fig. 5: Show Euhedral to subhedral colorless garnet grains, X18.

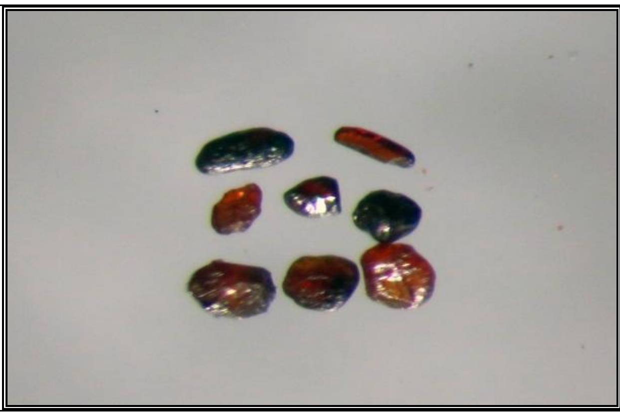


Fig 6: Show photomicrograph Reddish brown to opaque rutile grains, X30.

- Zircon ($ZrSiO4$)

It is mainly nonmagnetic mineral; most of zircon grains have a euhedral external morphology. It was recorded as short prismatic to long prismatic with pyramid termination, Also some grains were recorded as sub-rounded to rounded. However, it is concentrated in both non-magnetic and magnetic fractions at 1.5ampere. Zircon separated in the nonmagnetic field 1.5ampere has honey with yellow inclusions Fig.(7a) and water clear color with vitreous luster Fig. (7b) (Armstrong, 1922; Groves 1930; Poldervart (1955 and 1956). Saxena (1966) stated that the water clear zircon grains in all types of rocks are nonmagnetic.

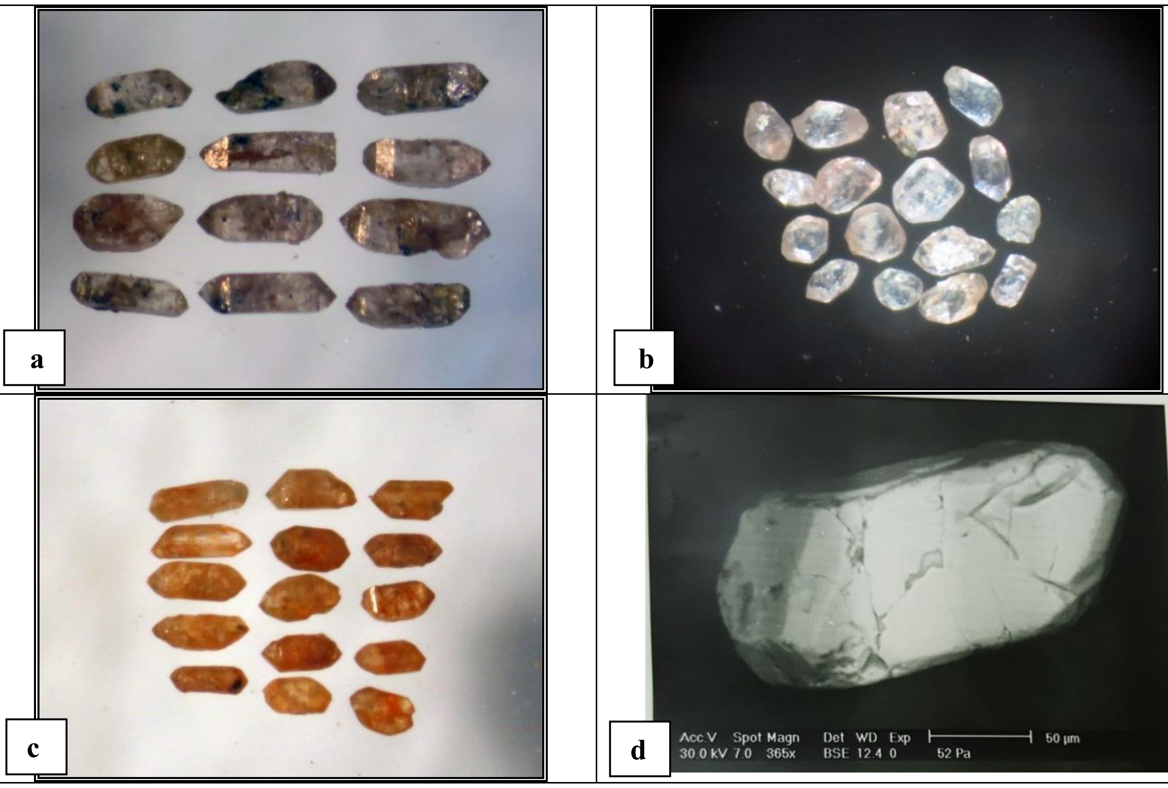


Fig. 7: Shows
(a) Honey zircon with yellow inclusions. X20.
(b) Water clear zircon. X18.
(c) Reddish yellow zircon. X20.
(d)BSE image showing Zircon.

On the other hand, the magnetic are long prismatic brown to blackish brown dark yellow and reddish yellow with vitreous luster Fig.(7c). The variation in the color of zircon may be attributed to the density of fine inclusions as well as the degree of iron oxides staining. Some inclusions may be due to iron ions that could have penetrate from the original melt through zircon lattice during magmatic crystallization or from an outside source (Hassan 2005 and Surour *et al.,* 2003). These inclusions are considered as weak points which accelerate the disintegration of the grains (Carrol, 1953). The magnetic susceptibility of the zircon grains increases as the density of inclusions increases as well as the iron oxide staining on zircon particles. Pure zircon grains were investigated under the Environmental Scanning Electronic Microscope (ESEM) which shown in Fig.(7d).

- Sphene (Ca Ti Si O5)

Titanite is more common in all samples of the studied area. Its color varies from yellowish to brownish yellow with vitreous luster. Titanite mineral grains are subhedral to anhedral grains of adamantine luster with imperfect cleavage Fig. (8a) and perfect cleavage Fig.(8b). Titanite was separated at magnetic field strength 1.0ampere and less common in 0.5ampere using the Frantz Isodynamic separator. It is widespread in acidic intermediate igneous rocks and in several metamorphic rocks as accessory phase. Pure titanite grains were investigated under the Environmental Scanning Electronic Microscope (ESEM) which shown in Fig. (8c).

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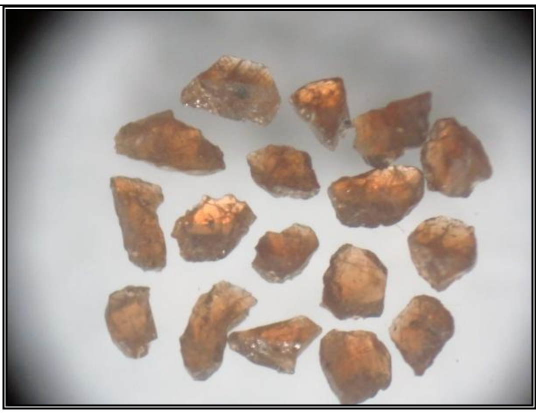
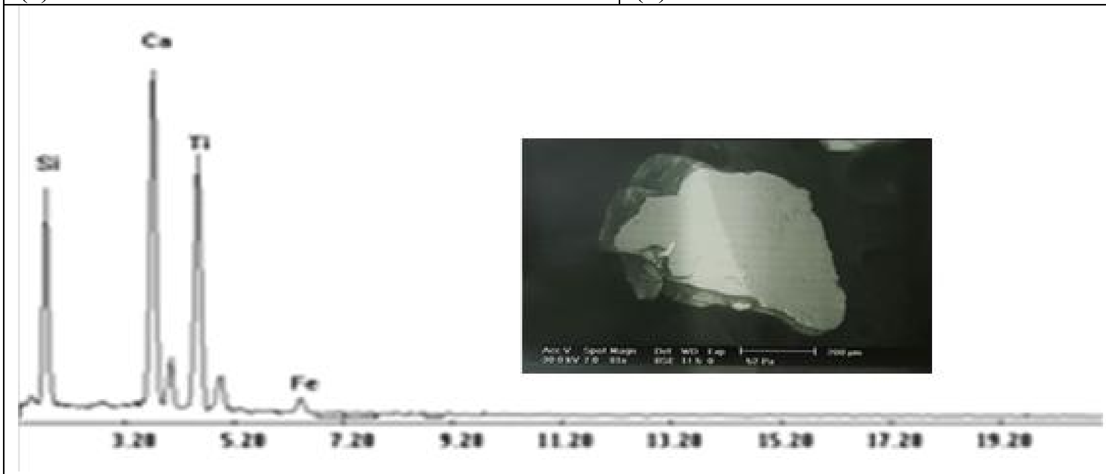


(a)

(b)



(c)

Fig. 8: Shows
(a) Titanite with imperfect cleavage, X12.
(b) Titanite with perfect cleavage, X12.
(c) EDX and BSE image showing Sphene.

- Fluorite (CaF2)

Fluorite is the main source of fluorine. Its color is violet with vitreous luster. a single crystal can be multi colored. The color variations are caused by various impurities, and may be reflects the strong effect radioactive mineralization (U-Th) (Hassaan, 2005; Phillips and Griffen, 1981) in the host rock. Fluorite was separated at magnetic field strength 1.5A nonmagnetic using the Frantz Isodynamic Separator. Pure titanite grains were investigated under the Environmental Scanning Electronic Microscope (ESEM) which shown in Fig.(9).

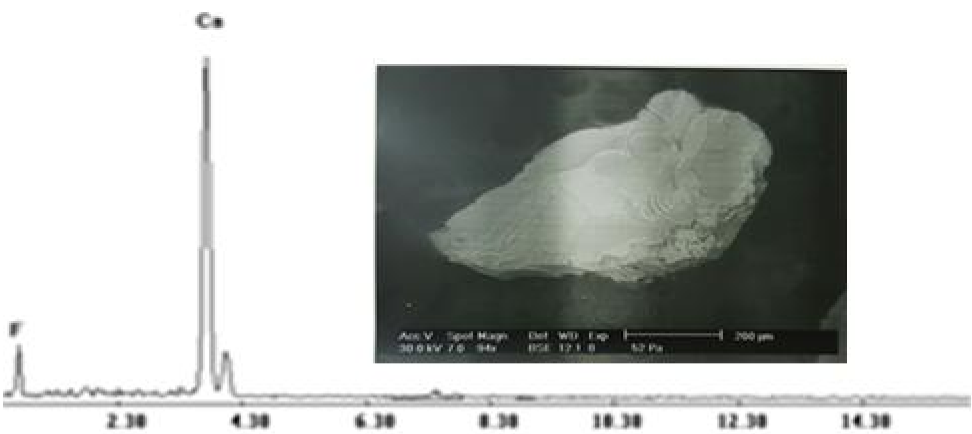


Fig. 9 : EDX and BSE image showing Fluorite.

- Biotite: [K (Mg, Fe) 3 (Al, Fe) Si3 O10 (OH, F) 2]

Biotite has pale yellow to brown color with vitreous luster Fig. (10a) and muscovite has white color with vitreous luster Fig. (10b), both ranges from transparent to translucent in transmitted light. They are commonly occurring as lamellar plates without crystal outlines. Cleavage is perfect and giving flexibility and elastic lamellae.

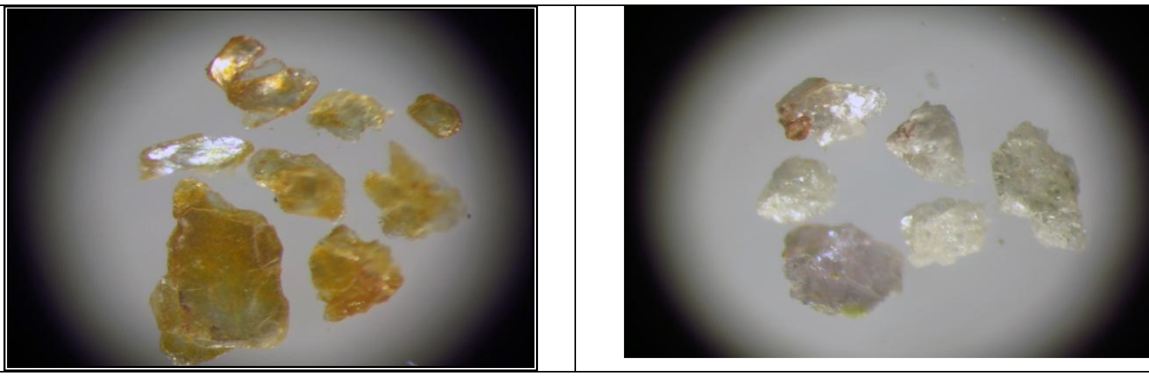


Fig.(10): shows
(a)Yellow biotite with perfect cleavage, X15.
(b)White biotite with perfect cleavage, X15.

- Chalcocite: Cu_2S

Chalcocite has brown color with metalic luster. They are commonly occurring as isometric crystal system and are not radioactive. The studied samples as euhedral to subhedral grains with sharp edges showing by Fig.(11).

- Atacamite: ($Cu_2Cl(OH)_3$)

Atacamite draws its name from the fact that it originates in the Actacama Desert in Chile and has light green to dark green colored halide mineral and it polymorphic crystal. This mineral is rare

and found as an ore of cupper. Actually, this is a secondary mineral that from due to the oxidization of other cupper minerals.
These are also viewed as alteration products of cupper, non-fluorescent in nature, common in arid regions with oxidizable cupper minerals and often associated with many other colorful such as: Cuprite, Cornetite and Linarite minerals, and is not radioactive, The studied samples as euhedral to subhedral grains and light green to dark green colored and rich by iron and wolfarmite showing by Fig.(12, 13 and 14).

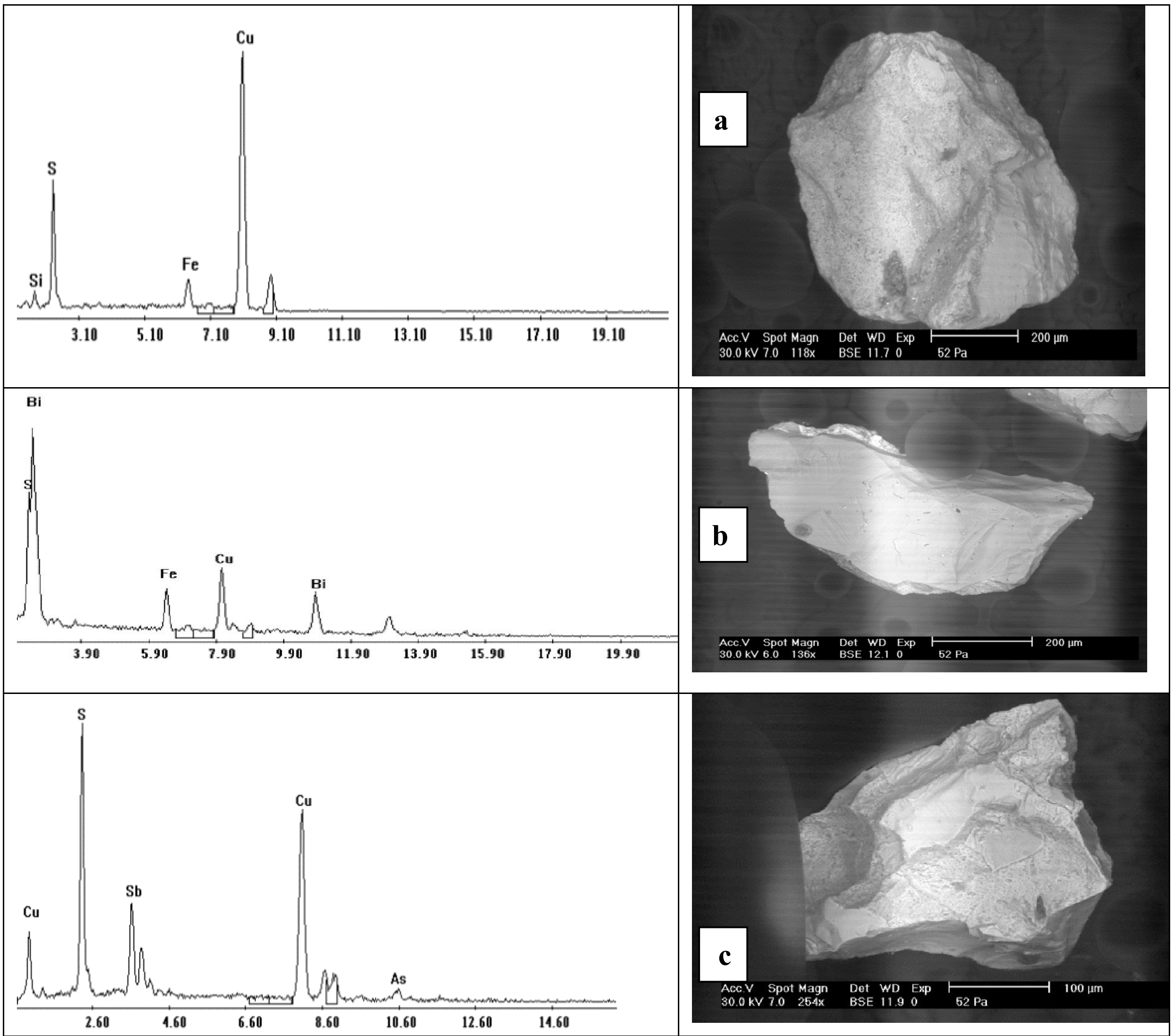
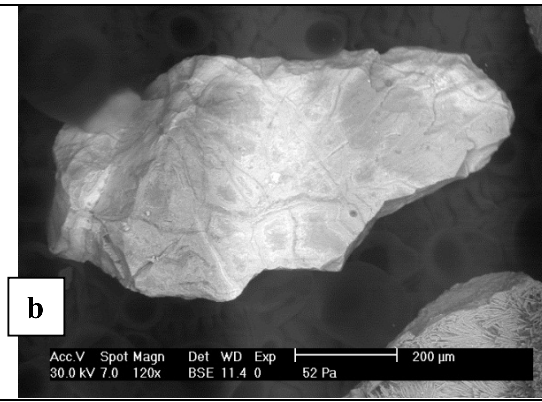


Fig. 11: EDX and BSE image showing:
(a) Chalcocite grains. (b)Bismuth rich chalcocite. (c)Antimony rich chalcocite.



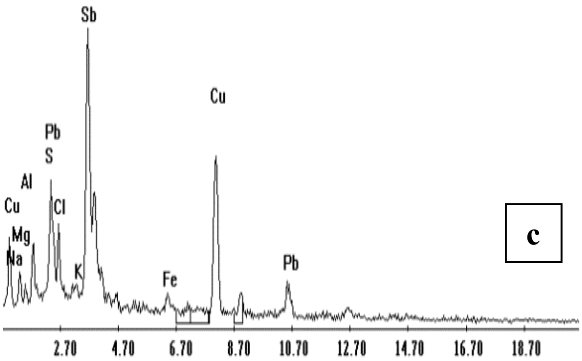
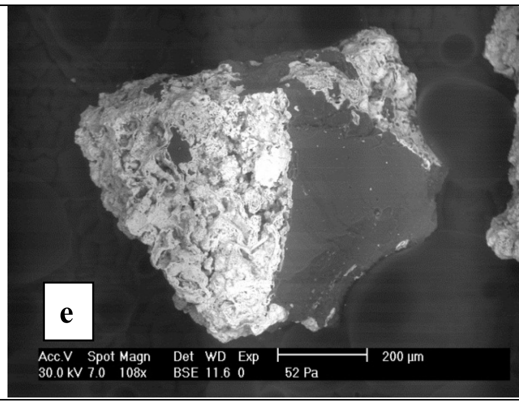


Fig. 12: Shows

(a) Atacamite grains, X9.
(b and c) EDX and BSE image showing Atacamite.



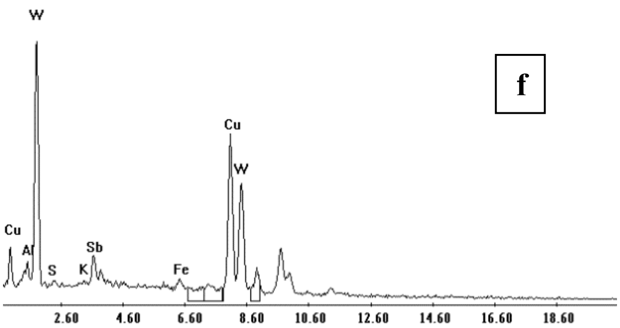


Fig. 13: Shows

(d) W rich Atacamite. X12.
(e and f) EDX and BSE image showing W rich Atacamite.

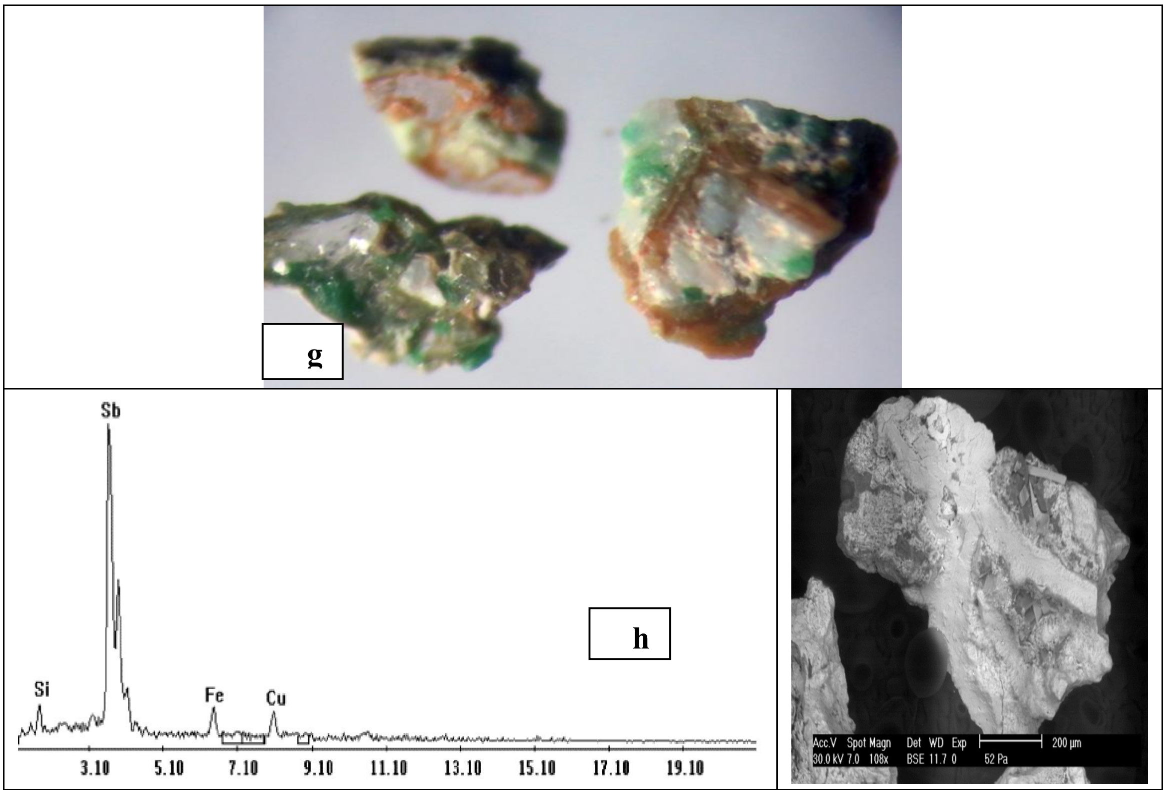


Fig .(14): shows
(g) Fe rich Atacamite. X22.5.
(h) EDX and BSE image showing Fe rich Atacamite.

- Cupper Minerals: (Cu)

The studied samples have red and light pink color with metalic luster Fig. (15). They are commonly occurring as isometric – Hex octahedral crystal system and cupper is not radioactive.

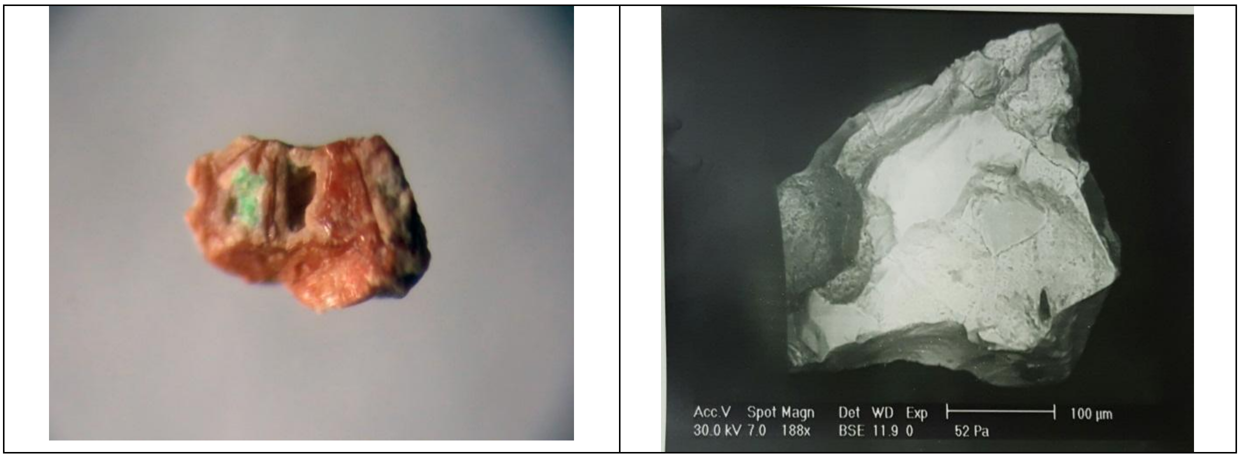


Fig. 15: Showing Photomicrograph and BSE image of cupper grains.

- Manganese Minerals: (Mn)

The studied samples have pale yellow to brown color with metalic luster Fig.(16). They are commonly occurring as angular grains with isometric crystals.

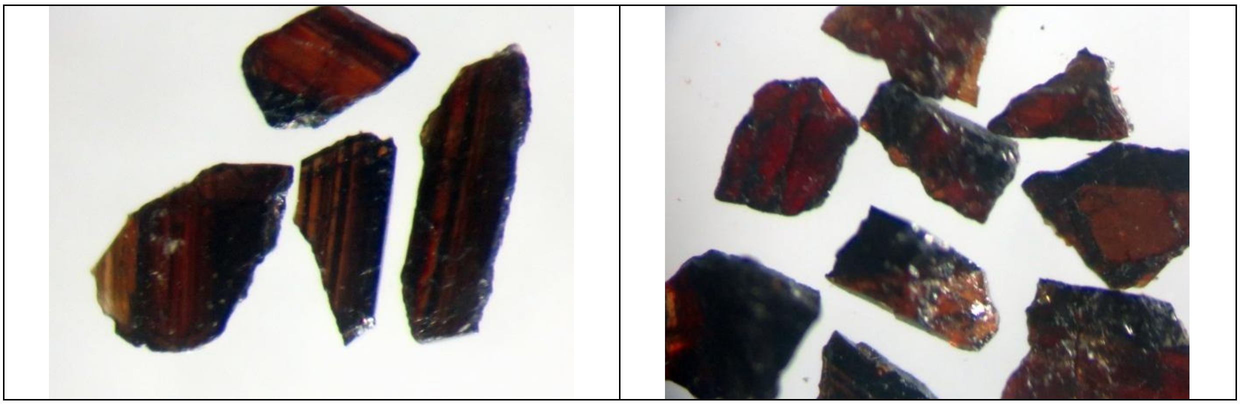


Fig. 16: showing Photomicrograph shows Mn grains X30.

- Green silicates:

The less stable non opaque minerals group mainly includes the pyroxenes and amphiboles minerals group. They were separated during heavy liquid separation in the heavy bromoform (sp. gr. 2.85 gm/cm3). They mainly concentrated in the first magnetic fraction 0.2A and the rest found in 0.5A using the Frantz Isodynamic separator and decreases with increasing if magnetic field strength.

Radioactivity

Uraniferous rocks are defined according to Darnley (1982) as any rock containing uranium at least twice the Clarke value (4 ppm). Assaf *et al.* (1997) concluded that uraniferous granites should contain more than (18 ppm) uranium. Normally, thorium is three times as abundant as uranium in rocks (Rogers and Adams, 1969). The present anomalies are probably due to occurrence of hydrothermal alterations (hematitization, limonitization and kaolinization) associated with the highly fractures of the above mentioned quartz - syenitic apophyses. These radioactive rocks were subjected to active hydrothermal processes. Therefore, the distribution of radioactivity in El-Dob is mostly lithologically (El. Meligy *et al.,* 2000**)** and structurally controlled and could be considered as a result of an epigenetic process (Abu Steet, 2007). So according to the Twice Clarke value and Th/U ratios are less than 3 can be conceder El-Dob studied younger granites are uraniferous fertile granites which contain (90 ppm) eU for the younger granites and (232 ppm) eTh, and the variation of uranium and thorium with their ratios reflect the amount of remobilization of uranium and showed that high remobilization is indicated in some types of granites. This means that post magmatic redistribution of uranium took place, Table (2).

The distribution of eU, eTh, and Ra for stream sediment and hard rock illustrated in Fig. (17 a,b,c,d,e and f) and can conclude that younger granite of El- Dob is fertile granite and the stream sediments show high concentration at downstream. Strong eU/eTh anomalies were observed over fault zones and contacts between the granites and Quaternary sediments, Fig. (18).

Table 2: Showing the radioactive measurements (ppm) in the younger granites in the studied area.

Samples Types	Sample. No	eU (ppm)	eTh (ppm)	Ra (ppm)	K (%)	eTh/eU (ppm)	eU/Ra) (ppm)
Stream Sediments	1	1	3	4	1.18	3	0.25
	2	1	3	4	0.92	3	0.25
	3	15	25	2	0.92	1.7	7.5
	4	9	17	3	1.04	1.9	3
	5	12	19	3	1.27	1.6	4
	6	10	18	2	0.92	1.8	5
	7	13	19	1	1.48	1.5	13
	8	13	20	3	1.12	1.5	4.33
	9	14	21	2	1.05	1.5	7
	10	14	21	3	1.07	1.5	4.33
	11	16	34	4	1.01	2.1	4
	12	20	38	4	1.18	1.9	5
	13	22	40	5	1.5	1.8	4.4
	14	32	45	4	1.5	1.4	8
	15	17	20	3	1.12	1.2	5.7
	Min.	1	3	1	0.92	1.5	0.25
	Max.	32	45	5	1.48	3	13
	Aver.	14	23	3	1.05	1.82	5.05
Hard Rocks	16	76	230	50	0.69	3.03	1.52
	17	54	110	40	0.97	2.04	1.35
	18	90	250	61	0.89	2.78	1.48
	19	120	300	87	0.5	2.50	1.40
	20	110	270	82	0.7	2.45	1.34
	Min.	54	300	40	0.5	2.04	1.34
	Max.	120	110	87	0.97	3.03	1.52
	Aver.	90	232	64	0.75	2.56	1.42

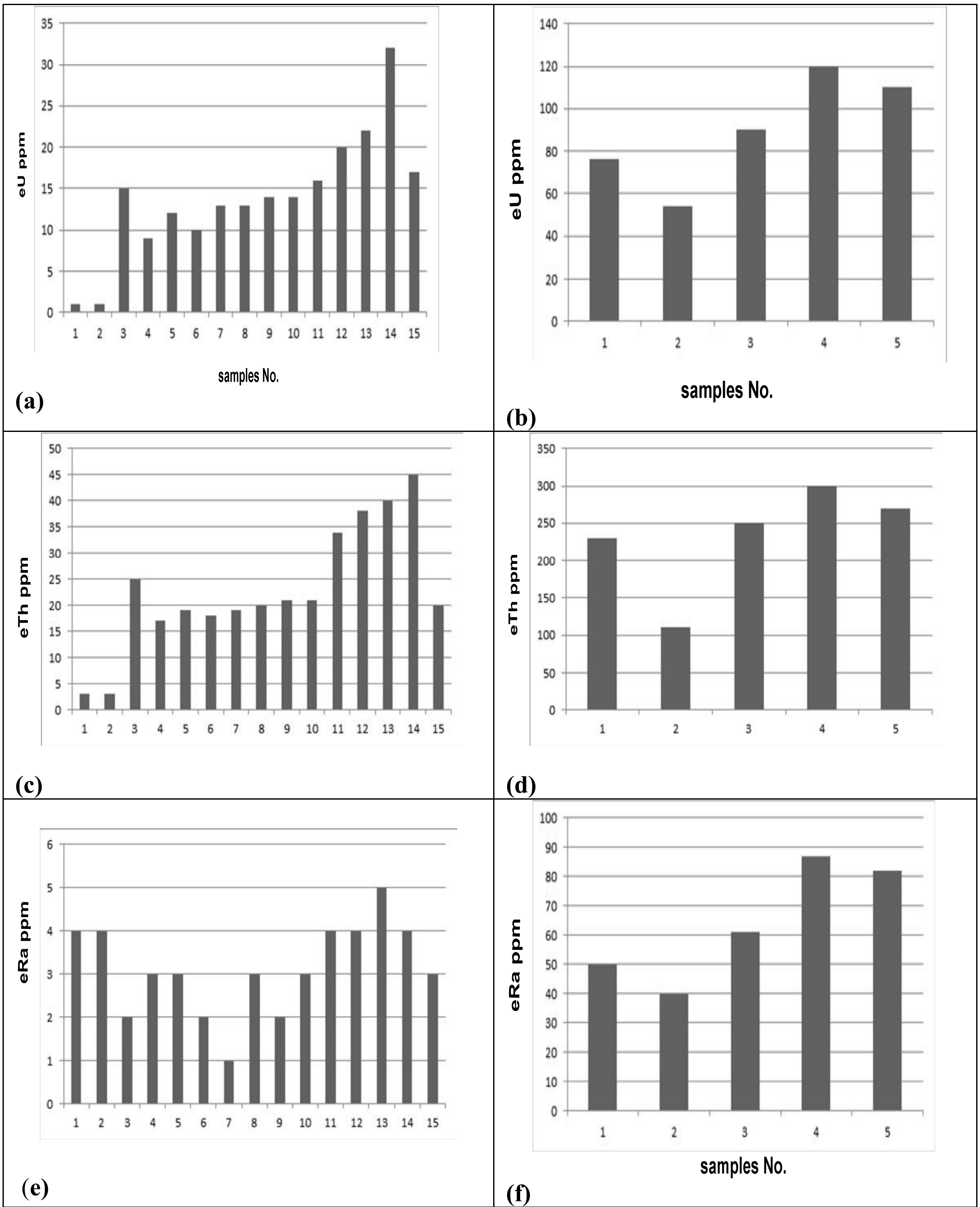
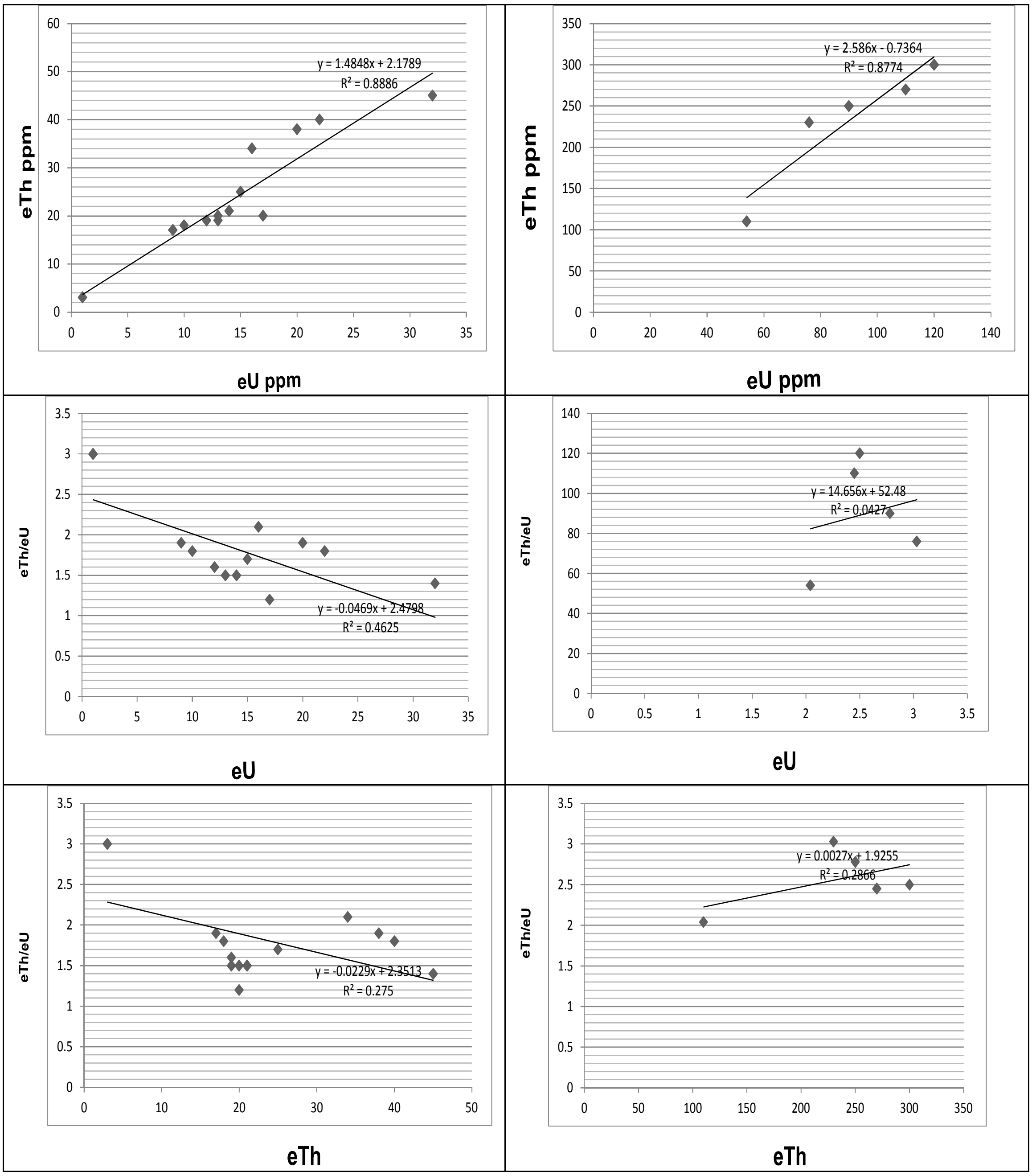


Fig. (17): shows
(a) Histogram the distribution of eU (ppm) in Stream Sediments.
(b) Histogram showing the distribution of eU (ppm) in Hard Rock.
(c) Histogram showing the distribution of eTh (ppm) in Stream Sediments.
(d) Histogram showing the distribution of eTh (ppm) in Hard Rock.
(e) Histogram showing the distribution of eRa (ppm) in Stream Sediments.
(f) Histogram showing the distribution of eRa (ppm) in Hard Rock.



(Stream Sediment Samples) (Hard Rock Samples)

Fig. 18: Showing the Radioactive Relationships between eU (ppm) and eTh (ppm) in the studied area.

Conclusion

The studied area represented by igneous rocks belonging to late Proterozoic units and the exposed rocks are: 1) Granodiorites are encountered in the southern, eastern and northeastern parts and 2) Akali feldspar granites .The present work can be classified the studied area mineralogically into two main groups. The first group is the opaque iron minerals as; Magnetite, Hematite, Goethite, Pyrite, Thorianite. The second group is non-opaque minerals include: Garnet, Rutile, Zircon, Sphene, Fluorite, Chalcocite, Atacamite, Biotite and Green Silicates, and the studied samples of Akali feldspar granites have average (90) eU ppm and eTh (232) ppm respectively and have average of Ra (64) ppm and K (0.75) %. So can be conceder these granites as uraniferous fertile granites. The stream sediments has 14 % eU, 23% eTh , 3 % Ra, 1.05% K. So the stream sediments have high concentration of radioactive distribution at downstream. This means that post magmatic redistribution of uranium took place

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