

Relationship of Tectonic and mineralization in axle of Kahyaz- Chah eshkaft.

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Extract

The range of issue discussed here is about the part of Alpid Folded Belt and an area from Volcano-Plutonic of Central Iran. This area is located in Northeast of Isfahan province and Northeast of Ardestan province. The most part of the size of this area is covered by volcano-plutonic rocks, Eocene, Oligocene and Pliocene rocks and only at the North part of it a narrow band of Quaternary Deposits can be seen.

In Shahrab zone and mentioned area which is part of Shahrab, there are some structures with Northeast-Southwest and East-West, and Northwest-Southeast trends which are the faults with pull-apart structures with East-West and Northeast-Southwest trends and are related to Neogene and compressive structures with Northwest-Southeast trends and postEocene-Oligocene.

The faults of this zone mostly have both Strike-Slip and Dip-Slip features which is indicated that this zone is located in a shear zone. The researches in relations between Geological structures and Mineralization in this area implied that mineralizations are located in active tectono-magmatic zone and mostly in active tectono-magmatic Neogene zone which are mostly related to pull-apart structure and are different based on tectono-magmatic activities and the type of magmatism happened in each part of Mineralogenesis.

1. INTRODUCTION:

The formation of mineral sources naturally is affected by lithology, geology formations, tectonic structures and magmatism complex. Actions of these factors are manifested in mineral sources and in different kinds of generations. Therefore to assess mineral dynamic of each zone recognizing the, alteration incidents, mineralization traces and detected mines are necessary.

Objectives of Accomplishing this Research:

1. Study the controlling systems of mineralization in the zone of Shahrab by using the map by the scale of 1/100000, magnetometer aerial map, satellite photos and anomaly information of geochemical of the zone.
2. Relation of mineralization and geology structures in the location of Kahyaz- Chah eshkaft.

1.1 : Study the zone of Shahrab by utilizing map by the scale of 1/ 100000

1.1.1 : Lithostratigraphic unit in Shahrab

Firstly Shahrab would be investigated generally and it is seen which this zone from geology unit aspects is included the Triassic, Paleocene, Oligocene, Eocene, Miocene units and very disperse trace of Pliocene and quaternary which mostly are volcanic- plutonic.

In the view of magmatism in this zone Ophiolites relative to subduction in Triassic in the location of west to south west would be seen then Eocene volcanic units which are concern to continental margin arc of Paleocene-Eocene are appeared and in Granitoid Oligocene magmatism had occurred at the result of a compressive regime, and also in Pliocene

Trachytes and basalts which are related to tensile regime of Neogene tectono- magmatic were formed.

2.1.1 : Structural zoning of Shahrab zone:

In this period of time Eocene to Pliocene had been affected by dynamic tectono- magmatic which resulted the bimodal acidic magmatism to basic which this bimodal acidic magmatism had been resulted from the action of the mantle with crust which is indicated the transformation of Oligocene compressional regime to tensile regime which was occurred at the time of Neogene that this tensile system had been resulted to formation of depression red mud flat and as a matter of fact it formed the Shahrab- Zavvareh's graben. In the map number 1 structural zoning of the zone is based on geology units, nature of the magmatism and it is seen which the formations of the zone are formed at the result of 4 main zoning and 8 subsidiary zoning which are:

2.1 : Study Shahrab' zone by utilizing its magnetometer aerial map

At the beginning we zoning the magnetometer aerial map based on magnetic anomaly trend (map number 2), anomaly discontinuity and assemblage (clustering) (map No .3) which based on this kind of zonation , we can observe ophiolite' zones by having high magnetic field in the north-east and south –west, but it is necessary to mention which in some mentioned places, ophiolite complexes cannot be seen at the surface and presence of these magnetic anomalies can be related to presence of oceanic crust at depth of this area.

Tectono-magmatic Oligocene-Pliocene zone by holding isolated chambers and anomalies disruption can be sign of presence of positive and negative chamber at the depth of the ground which had been could generate magnetic trends related to volcanic rhyolite with negative anomaly and blue color and generate andesite-basalt with positive anomaly and red color. In other words by considering to zoning of the magnetometer aerial map of the zone it can be seen that central part of the area indicated a tectono- magmatic regrowth and reconstruction at the age of Neogene. Based on achieved researches in this area it is obvious that structures with the trends of north-west to south-east are compressional formation types and structures with north-east to south-west trends are tensional types. And by referring to map No.3 we can observe that isolated anomalies in this area holding north-east to south-west trends(tensional) which indicates magma intrusion.

1.3.1 : Study the area by satellite photos:

Firstly we received photos by using ENVI software and divided licensed color bands on the satellite photos of the zone. In Each received photos one of the geology items appeared with a special color. In these photo, alterations are marked by using orange color(photo No.1), granitoids by pink rhyolites by white inclined to grey.In this photo fault's pictures are also marked as lineation which indicates fracture.

2.3.1: Study zone of Kahyaz- Chah eshkaft:

In order to have a wider view of this area first we considered Neyestanak- Ardestan by using satellite photo of these areas. Afterwards to have a more exact consideration of Kahyaz- Chah eshkaft axis satellite photos of this zone were studied. This photo which is resulted from divided licensed color bands in ENVI software, geology formations are marked more transparent and with more clarity. By using environment's photo and ArcGIS software we prepared geology formation's map of this range .

By using divided licensed color bands in ENVI on the primary satellite photos and also using ArcGIS software, we prepared alteration maps.

2. Study the relation between mineralization and geology formations at Kahyaz- Chah eshkaft area.

In order to do this research we designed zoning map of Shahrab in scale of 1/100000 by conforming area's geochemical anomalies data (No.4) and considered geochemical anomalies data and geology formations. This conforming indicates that geochemical anomalies were brought about tectono-magmatic actions and were mostly placed in dynamic tectono-magmatic zones. Also based on generated magmatism in each part, the type of geochemical anomalies would change. Therefore to have a more exact view we conform the geochemical anomalies map on the magnetometer aerial map of this zone (No.5) and with this achieved map we realize the concentration of geochemical anomaly index on the tensional structures with north-east to south-west trend and also it is seen that most of the geochemical anomalies accumulated in dynamic tectono-magnetic zones which have isolated anomaly magnetic chambers which of course based on fulfilled researches it was indicated that Neogene formations of this zone are in tensional type. In researches at the range of Kahyaz- Chah eshkaft by conforming alterations map on geology formations we also realized the direct relation of the alterations with tectono-magmatic actions.

Finally by conforming geology formation's map of the Kahyaz- Chah eshkaft zone and geochemical anomalies and mineral indexes of this area (No.6) we discovered a relation between anomalies and mineral index with tectono-magmatic actions. By researching map No.7 we can observe that geochemical anomalies are in neighborhood of faults which in range of those faults there are a batholithic intrusion or a dike lattice which as a matter of their intrusion, flux pressure in the area had increased and sials (fluids) were moved toward up and in its way had chemical reaction with rocks and as a result had enriched with mineral matters and at the end as a result of this action the pressional faults were decreased and moved to surface and they had formed geochemical anomalies and mineral anomalies. By accomplishing this research on the jointings formation in Kahyaz-Chah eshkaft we discovered two types of compressional and tensional formations that as a result of different types of tectonic formations (compressional & tensional), type of batholithic intrusion is also various and consequently variety of batholithic intrusion of geochemical anomalies and mineral index can also be different.

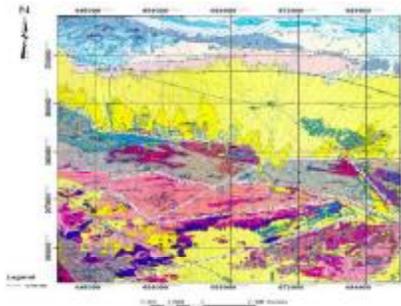
CONCLUSION

1. The location which was studied is located in volcano-plutonic belt of continental margin of Central Iran and its tracing paper magmatism and alkaline had been resulted from subduction of Tethys oceanic crust under continental sialic crust in which mixing between crust and mantle had occurred.
2. The location which was studied by having 2 types of crust i.e. residue of oceanic crust and transitional (intermediate) crust are recognizable at the magnetometer aerial map.
3. This zone had been located in two different pace of tectonic:
4. Comparison Tectonic regime with north-east to south-west trend and with the rise and forming a magmatic arc with the intrusion of Granitoids at the age of pre Eocene –Oligocene.

5. Tensional tectonic regime with north-east to south-west trend and East to West trends which resulted in forming of tectono-magmatic Oligocene- Miocene and Neogene (Pliocene).
6. 4. mineralization in this area is related to two different pace and as a result two tectono-magmatic events:
7. A: Mineralization related to Paleogene magmatism and with tracing paper and elephants (Cu & Mo)elements.
8. B: Mineralization related to Neogene magmatism and (Sb & As) elements.
9. 5: Tectono-magmatic regrowth zones with the volcanic basalt- rhyolite character indicating the intrupting mantle and action of crust which can result in forming AS and SB elements and perhaps gold, uranium, mercury and etc.[Au & U elements had not been analyzed in the samples].

RECOMMENDATIONS:

- 1: Utilizing data and information production by enjoying from modern technology can be so helpful in genetic conceptions of the terrain and design and accomplishment of exploratory projects.
- 2: In spite of the fact that range of the covering study was geochemical studies, if from the beginning, in order to determine dynamic tectono-magmatic zones and dynamic mineralization , before sampling, GIS and satellite photos had been used , better consequences could have been achieved.\.



Map 1

I : Ia: Shahrab playa with Paleogene bed-rock formed in Pleistocene- Quaternery.

I b: Shahrab zone Eocene bedrock

II:II a, II b: Paleogene volcano- plutonic zone.

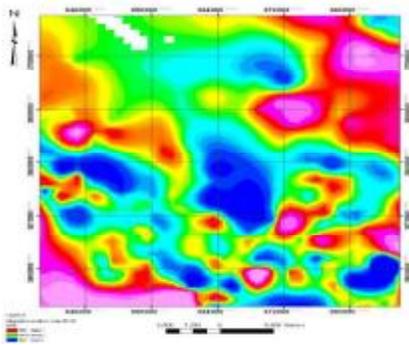
III: Oceanic crust complex.

IV: Paleogene volcanic series consisting of:

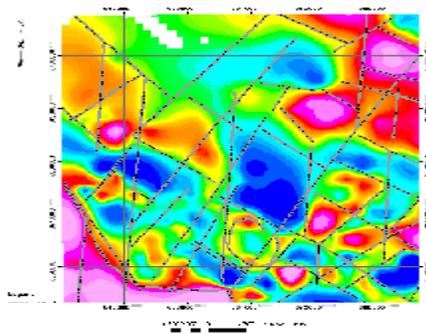
IV a: Tectono- magmatic activated sub-zone Oligocene with rhyolitic dykes.

IV b : Tectono- magmatic activated sub-zone in Oligocene by andesite- basalt volcanism and Pliocene volcanism.

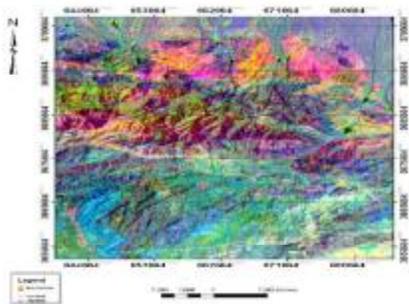
IV c : Eocene basement tectono- magmatic activated zone in Pliocene by alkaline volcanism.



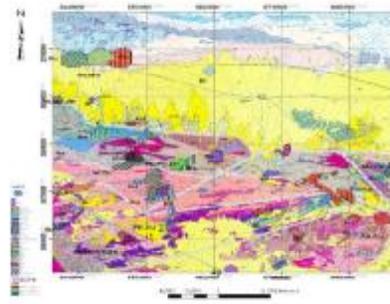
Map 2



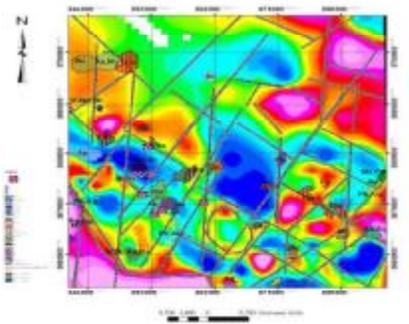
Map 3



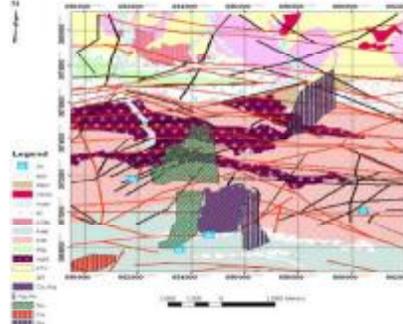
Picture 1



Map 4



Map 5



Map 6

Reference

- ❖ Shahabpoor article
- ❖ Ghasemi article
- ❖ Report of Pichab Kavosh by Bahram Aghaebrahimi Samani
- ❖ Article of Bahram Aghaebrahimi Samani