

## **Introduction , geology and petrology of emery rocks at chashme kallite region in tanbur mountain from sirjan**

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### **Abstract**

*Introduction of emery rock at a distance of 30 kilometers northeast from sirjan on chashme kallite region in tanbur mountain a section of the sanandaj - sirjan structural area . The main rock units of this region consists dolomitic marble-calcitic marble , marble ,micaschist ,amphibolite,gneiss and quartzite. The studies to exhibit this emery rock similar to another emery deposit in other region to be formed of corundum , an iron mineral magnetite- hematite, silica ,rutile , clinochlore that appeared in the figure of compact granular rock . This emery rock probably were formed by the metamorphism of bauxite or other alumina-rich materials in previous rocks. Emery is a gray to black, granular rock comprised of various minerals including corundum, an iron-bearing mineral (usually magnetite, hematite or hercynite) and several trace impurities such as titania, silica , Clinochlore and magnesia. The hardness of emery normally ranges between 7 and 9 on the Mohs scale, depending on its mineral com- position and level of impurities.*

**Key word:**Emery , , magnetite , grinder , tanbur mountain

### **Introduction**

chashme kallite region is located at a distance of 30 kilometers northeast from sirjan on tanbur mountain with average geographical coordinates : N:29,50,14 E: 55,31,53 .

This region a section of the sanandaj - sirjan structural area and from the viewpoint of locally ,a section of the tanbur block from northeast of sirjan . this block rock units structural process similar to sanandaj - sirjan structural process with northwest-southeast trend . previous studies in this region to characterize, The main rock units of this region consists dolomitic marble-calcitic marble , marble ,micaschist ,amphibolite,gneiss , quartzite, blackschist , slate and phylite whit ordovisian age . (sabzeie and ete all ,1995) .Thus in this studies only to point the rocks together with micaschist that rich of aluminium and iron with paragenesis : corundum + Clinochlore + opac mineral (sabzeie and ete all ,1995) . Field studies in this region in addition to characterized rock units exact petrology to define the rocks that to point above and in previous studies to be emery rocks that don't exploration up to now. Emery is a gray to black, granular rock comprised of various minerals including corundum, an iron-bearing mineral (usually magnetite, hematite or hercynite) and several trace impurities such as titania, silica , Clinochlore and magnesia. The hardness of emery normally ranges between 7 and 9 on the Mohs scale, depending on its mineral com- position and level of impurities.

### **Discussion**

#### **1-Geology of region**

chashme kallite region a section of the sanandaj- sirjan structural area and from the viewpoint of locally , a section of the tanbur block from northeast of sirjan .tanbur block including mountin range that beginning at northeast of sirjan and to continue to balvard region from baft city . this region is located exactly at northwest of tanbur block .

Based on previous studies in this region, to characterize, The main rock units of this region consists thickness layerd dolomite , dolomitic-calcitic marble , arenaceous limestone , marble ,micaschist ,amphibolite,gneiss , quartzite, blackschist , slate and phyllite whit emery rocks that their rocks situation to specify on geological map that supply of this region . this block rock units structural process similar to sanandaj - sirjan structural process with northwest-southeast trend .

Description of chashme kallite rock units from olden to present:

The PZ<sup>MS<sub>2</sub> 4</sup> lithology unit , collection of metamorphic rocks include micaschist and the amphibolites . based on studies on this rocks to show, protolite of this rocks is basaltic lava that to be spilled on the active basin . the main porphyroblaste on micaschist rock consists almandine groan and actinolithe . this unit gradually to become changed into PZ<sup>4</sup> unit .

The PZ<sup>4</sup> lithology unit , that to be dominant lithology unit of this region and on continuously on Unit PZ<sup>MS<sub>v</sub></sup> Were Including periodic of brown thick layer dolomite with between layers of dolomitic - calcitic marble and arenaceous limestone, micaschist ,amphibolite,gneiss , quartzite.the dolomite are grain sugary and granoblastic texture and the mineralogy Paragenesis of this dolomite is: siderite ± dolomite ± talc ± quartz ± termolite± iron rich minerals . mineralogy Paragenesis of micaschists in this unit is: Grona + Kyanite + sillimanite + andalusite + biotite + rutile + muscovite +sphene + zircon + chloritoide . In the alternation of this unit the rocks with Paragenesis corundum + magnetite + hematite + quartz + Clinochlore + Mskvyt outcrops Find the emery rocks that we are discussing.

The PZ<sup>3 gn,m</sup> lithology unit only at tanbur mountain and only in chashme kallite region is outcrop . This unit consists alternation of dolomitic marble, micaschist ,amphibolite,gneiss , quartzite. This lithology unit in this area about 300 meters thick and to end whit white quartzite layer with 30 to 50 meters thickness at the end. micaschist in the upper parts of this unit are rich of iron oxide(magnetite).

The pz<sup>5</sup> lithology unit Including alternation of greenschist rocks (phyllite, cricite schist, garnet cricite schist, biotite schist) and dolomitic - calcitic marble is the thickness of 100 meters. The pz<sup>am</sup> lithology unit Including amphibolite rocks that to be metamorphosed at amphibolite facies and their consists large rutile crystals that have to a meter size . The TR<sup>1</sup> lithology unit Including thick layers of limestone and crest ,which to be placed continuously on the previous unit.

### 1- Introduction of emery rocks

Based on precise studies that were conducted in chashme kalite region, contact with two outcrops wich among at the Dolomite rocks was formed. The agent that separate this rock unit from the other units the gray black colore of this outcrops and In particular, high magnetism of this unit, which at first was felt a iron deposit occurred, but more accurate surveys and mineralogy and chemical tests that were performed on this outcrops provided interesting results.The XRF test results was performed On this outcrops rock samples, show the percentage of aluminum oxide that in this example about 40% highest than iron oxide in this sample is about 21%, which these events was surprised, because the magnetism of this rocks is very high . The XRD test revealed that the rock minerals manufacturer in order of priority are corundum, magnetite, hematite, quartz, rutile, Clinochlore and muscovite. This data revealed the reason is that high percentage of aluminum oxide of this rock to depend

corundum mineral and the reason is that high magnetism relate to these minerals are magnetite. Also, past studies that had been done in this area only to point the rocks together with micaschist that rich of aluminium and iron whit paragenesis : corundum + Clinochlore + opac mineral (sabzeie and ete all ,1995)Precisely Investigations to identify this outcrops are masses of EMERY rocks that are very rare. Emery is a gray to black, granular rock comprised of various minerals including corundum, an iron-bearing mineral (usually magnetite, hematite or hercynite) and several trace impurities such as titania, silica , Clinochlore and magnesia. The hardness of emery normally ranges between 7 and 9 on the Mohs scale, depending on its mineral com- position and level of impurities and the imperative as high hardness has made an excellent abrasives. Outcrops of emery rocks that identified in chashme kallite have been formed As a mass above the fault zones. Geographic location of this mass is given figur 2. The rocks that embraced this emery masses are dolomite, micaschist and amphibolites .

### 1- Petrology of emery rocks

Although this masses and emery deposits are rare in the world don't more studies about petrology and genesis of this mass has been done, and previous studies can not approach for justify how this rocks was formed and only reference the type of minerals to formed This emery rocks and about place to be formed this masses that often on metamorphism rocks . So try that petrology studies on this emery rock at chashme kallite region, in addition to specify petrology of this masses in order to present model for how this rock was formed . For this purpose first to perform detailed geological survey in the region and The rocks that embraced this emery masses .Then, extensive petrography studies was performed on thin sections that prepared from this region rock samples . Petrography studies on rocks that embraced this emery masses in the first stage don't show any mineralogy relationship with emery rocks and include periodic thin layer of dolomitic marble and this cause to drilling around the mass . Doing excavation revealed that under this thin layer alternation of dolomitic marble, to be comforted alternation of micaschist and iron-rich amphibolite which mineralogy Paragenesis of micaschists in this unit is: Grona + Kyanite + sillimanite + andalusite + biotite + rutile + muscovite + sphene + zircon + chloritoide.

Studies that to perform on emery rocks to specify the mineralogy Paragenesis of this rock : corundum + magnetite + hematite + quartz + rutile + Clinochlore + chloritoide + muscovite. corundum in thinsection have high releif and usually colorless and weak birefringence but often because hardness it seems thicker than other minerals and that interference colors as the second series . corundum was formed probably result of again metamorphism on the previous aluminiferous minerals for example by increasing metamorphism degrees muscovite hydrolyze could be formed ortose and corundum . Magnetite and hematite before was formed on rocks such as amphibolites and to influence metasomatism process to appear on emery rock .based on this studies , this emery rock probably were formed by the metamorphism of aluminosilicate mineral or other alumina-rich materials in previous rocks

### Conclusion

Emery rocks from chshme kallite region with this mineralogy Paragenesis: corundum + magnetite + hematite + quartz + rutile + Clinochlore + chloritoide + muscovite was formed in

result of metasomatism process on previous aluminium and iron rich metamorphism rock in this region .the dark color of this rock as a result of iron oxide such as magnetite and hematite. The hardness of emery normally ranges between 7 and 9 on the Mohs scale, depending on its mineral composition and level of impurities

## Reference

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Figure-1 chashme kallite region located

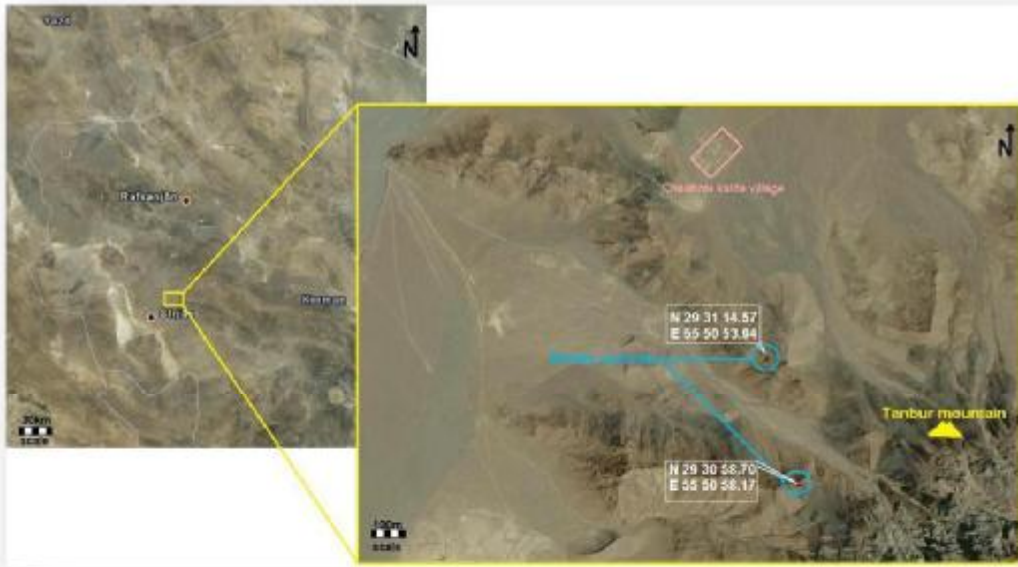


Figure-2 satellite image of chashme kallite region



Figure-3 chashme kalite region on northwest of tanbur mountain



Figure-5 The PZ<sup>4</sup> lithology unit

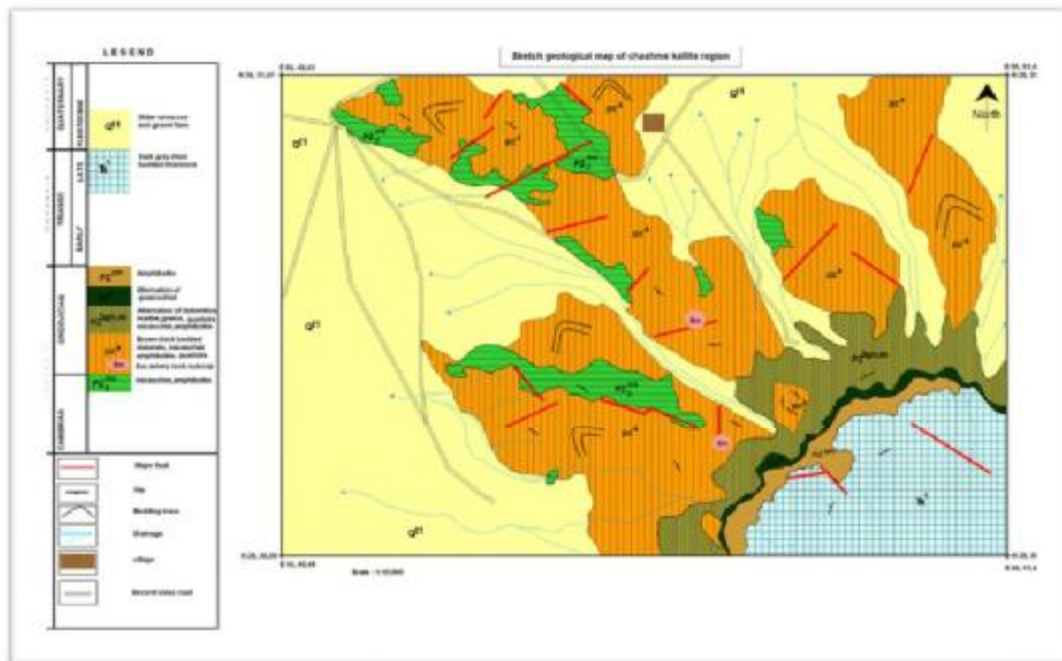


Figure-6 geological map of chshme kallite region

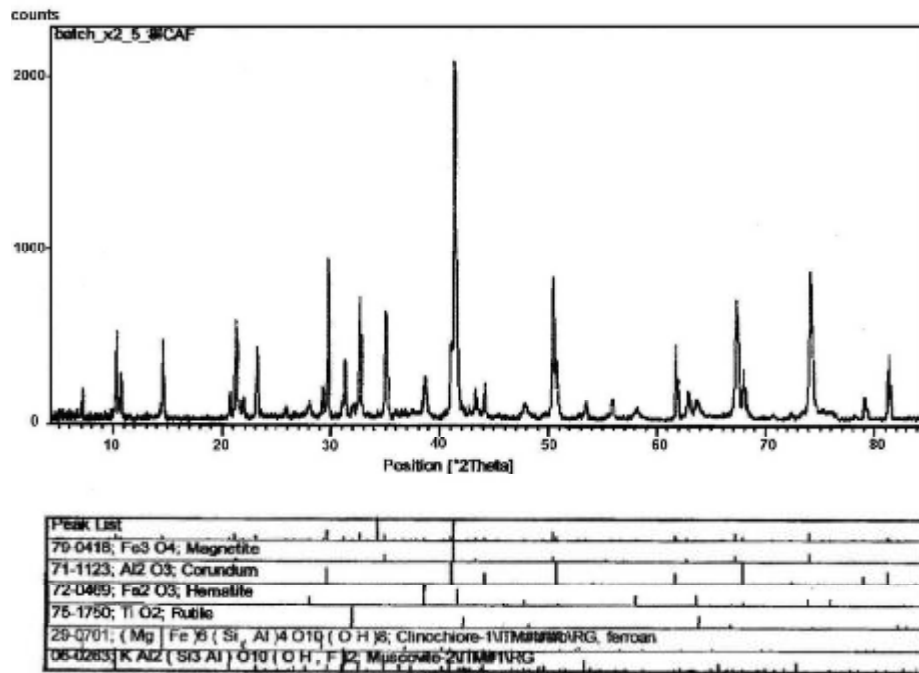


Figure-7 xrd analysis result of emery rocks