Mineralogical evidence of advanced argillic alteration, Ghaleh Dar Area, in the Central Iranian Magmatic Belt

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The Eocene volcanics and pyroclastics from the Ghaleh Dar area (part of the Cenozoic magmatic belt of Central Iran) have undergone extensive hydrothermal alteration. Major alteration zones are showing inclusions of, propylite, quartz sericite, advanced argillic and silicified zones. Ghaleh Dar alunites are mainly porcelaneous and their compositions show a solid solution between alunite and jarosite. The following mineral assemblages are distinguished in alteration zones:

Alunite-jarosite + quartz + sericite + alkali feldspars + chlorite ± turquoise ± barite ± iron oxides.

There are many alunite and jaroste occurrences, mainly as veinlets, in parts of the advanced argillic zone.

Alunite $\delta^{18}O$ and $\delta^{2}H$ values fall in range -1.76 to 8.81‰ and -52.86 to -129.26‰ respectively. On the basis of field, mineralogical evidence and results from light element stable isotope data ($\delta^{18}O$, $\delta^{2}H$ and $\delta^{34}S$), the Ghaleh Dar alunitization is derived from the supergene origin**.**

Mineralogical and petrological studies of the igneous-evaporite rocks within salt domes, high Zagros, Iran

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Kaj-Rostam Abad, Dashtak and Do Ab salt domes are located around Ardal and Farsoun village. This area is situated in High Zagros (Chaharmahal and Bakhtiary province). The study area is composed of lower Cambrian volcanosedimentary complex including basalt, basaltic andesite, andesite, trachyte, pyroclastics, evaporite rocks and Precambrian sedimentary units.

The igneous rocks out cropped are volcanic and sub volcanic. These rocks have complex mineralogical composition. Those minerals have crystallized in magmatic stage (plagioclase, clinopyroxene, apatite and kersutite), metasomatism (actinolite, biotite, quartz, sphene, calcite and epidote) and vein mineralization (actinolite, albite, quartz, calcite, garnet, chlorite and epidote). Petrographical study shows that microlitic-porphyric, intersertal and amygdaloidal textures in these rocks. Chlorite, epidote and actinolite are common in basaltic rocks. Extensional stress may be caused the formation of apatite and gypsum. Olivine without reaction margins, apatite, needle kaersutite and clinopyroxene with sector twining and zoning point to the alkaline nature of the rocks.

We have done some EPMA on clinopyroxexne, hornblende, garnet, asbest amphibole, epidote and palgiocalse. EMPA results show titaneaugite-diposide, kaersutite, actinolite, andradite-grossular, pistachite and albite are main minerals in these rocks.

The high content of TiO_2 center in hornblende and clinopyroxene has shown the alkaline nature of magmatism which occurred within plate rift environment. Hydrothermal phase enriched in Na_2O, Fe_2O_3, H_2O, CO_2 and CaO has caused epidote, calcite and actinolite.

On the basis of XRF analyses the chemical composition of these rocks are basalt to trachyte. According to the geochemical diagrams the nature of magma is transitional.

By the clinopyroxene geochemical and geothermometry data, this mineral is formed in the 1220ºC and intermediate to low in pressure. Not only the vein chlorite temperature is 350ºC-510ºC but also the asbest amphibole and andradite are stabeled in 300ºC-520ºC and 0.5-2 K bar in pressure. On the fluid inclusion study of vein quartz the salinity of hydrothermal fluid is high. The values of $^{18}O/^{16}O$ isotopic data have shown that the veins of quartz have originated from sedimentary-evaporate fluids.