

Petrography and Mineralogy of Calc Silicates in the Northeast of Golpayegan

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Abstract

The studied region is located in the zone of sanandaj –Sirjan. The zone is originally part of central Iran, and it is as a metamorphic band lengthy along Zagros trust from Orumieh and Sanandaj in northwest to Sirjan and Esfandagheh in Southeast. In petrography studies, the calc silicate rocks include minerals of olivin, pyroxene (ortho- pyroxene, clino- pyroxene), serpentine, termolite, biotite, muscovite, Iron oxide, which have the granoblastic texture and have crystallized and shape in some section olivin distinct sequences of calcium silicates or magnesium silicates progress in quartz dolomites marble which are begun with the talc and then with termolite in the facies of green schist. Also, minerals of talc, termolite, diopside, forsterite are created in these rocks with the increase of degree of metamorphic. Reactions including forming these minerals in calc silicate rocks are talc formation by reaction of dolomite, quartz and water, termolite formation by reaction of talc, calcite, and quartz, diopside formation by reaction termolite, calcite, and quartz, forsterite formation by reaction of termolite, dolomite, existence illite clay minerals muscovite origin in dolomite marble, that is possible talc in geochemical Analysis. Serpentine is formed by olivine; clino- pyroxene and Iron oxide are formed by olivine. The minerals olivine and pyroxene together in a rock indicate the high temperature of rock formation. Also petrography findings show that the rock has passed two progressive and regressive phases.

Key word: Petrography, Mineralogy, Golpayegan, Calc silicate.

Introduction

The studied region is located in Sanandaj- Sirjan and the silicate rocks of this region are located in the Northwest of Isfahan and in the South of Markazi province. About these mentioned stones, It did not study any complete or comprehensive study and in resources like (2, 3), only the rock names have been mentioned. The lime stones of dolomite are the benefit indices to define the alteration because they have a set of calcium, magnet silicates like talk, termolite and diopside which can make in the conditions of pressure, stress and usual temperature (7). The public sequence of minerals categorizing is defined first by Eskola (1922) in dolomite marbles minerals and then Bowen (1940) and Tilley (1951) introduced the importance of talk in the lowest temperature of metamorphism. The mineral sequence in dolomite lime stones which have regional metamorphism is including:

Talk (it is not always existed), termolite, diopside or forestrite, diopside + forestrite

Discussion

1. The study method:

After field study and sampling with hammer and using of GPS to measure the coordinate of length and width the thin section was provided and they were petrography by using of polarize microscope and by Atlas of metamorphic rocks:

2. Petrography:

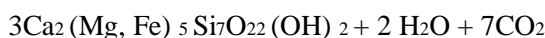
The most suitable method to define the lime sediments is that we can categorize them into two groups, one is the marbles which have plenty of carbonates and the other is silicates calc which are without carbonate or little carbonate. The region of mineralization of silicate stones is so invasive because their mineralization is related to the exact mixture of sedimental compounds in first layers. The silicate stones in this region is including of olivine, pyroxene, serpentinite, Talk, Biotite (phlogopite) and termolite. Which are including the granoblastic texture (Figure 1). In dolomite stones of silicate, talk is the first mineral which is made according to the reaction of 1(7):



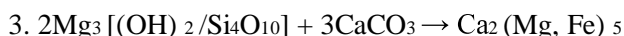
dolomite quartz water Talk calcite carbon dioxide In the stones of quartz poor, quartz can be used completely via the reaction of (2) and the composite of talk + calcite + termolite will be remained. But in siliceous stones, the used Talk and the composite of termolite + calcite + Quartz will be made. The final disappearance of talk in these stones can be related to below reaction



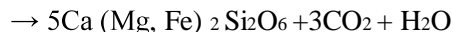
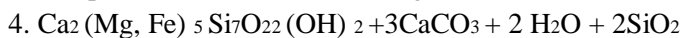
talk



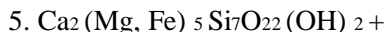
termolite



Diopside and forsterite according to reaction of 4, 5

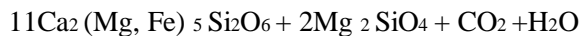
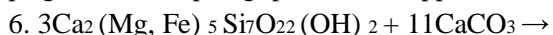


diopside



forsterite

For companionship and symbiosis of the minerals of olivine and pyroxene, regard to the presence of their kind is related to (stone composition) and is required to more temperature degree. forsterite is including in the stones poor of silicate or the stones poor of dolomite diopside and forsterite can be symbolised only when the connected line of termolite + calcite will be omitted by below reaction. Also the existing of clay minerals and other tainting in dolomite can be caused to system complication and the minerals like Epidote, Muscovite and plagioclase and phlogopite will be appeared in the stones.



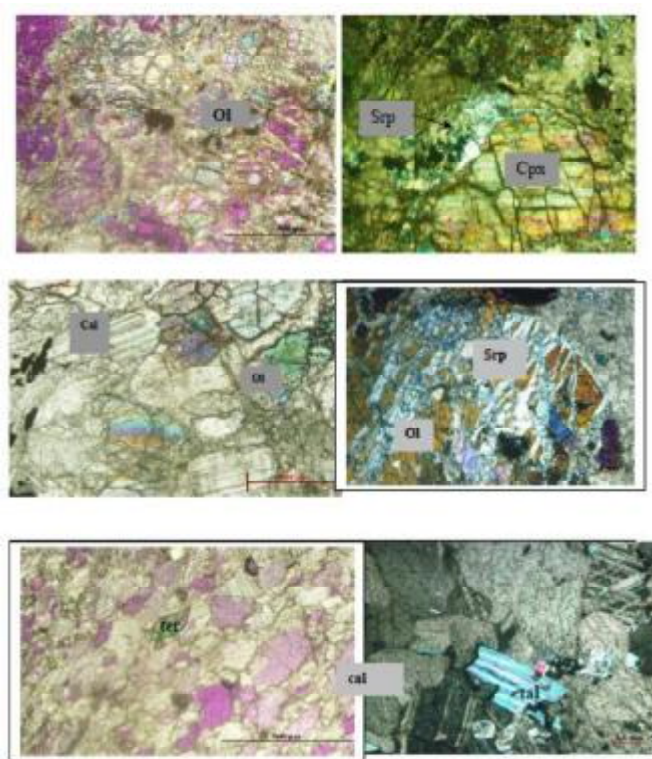


Fig 1. Microscopic images of calc silicates in the north east Golpayegan (50x, XPI)

Conclusion:

1. The existing of olivine, pyroxene is indicating of the progressing alteration phase and the .existing of Iron oxides and serpentine is indicating of unprogressing alteration phase.
2. Existing of minerals like olivine, pyroxene and Termolite is indicating of altered lime stones the companionship of minerals of olivine and pyroxene in stones is indicating of high temperature degree in stones.

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