



Crustal evolution approach by common textures and structures in listvenites in east of Iran

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Listvenitization is a very popular alteration in serpentinized peridotites in ophiolitic *mélange* sequence in sisthan suture zone (SSZ). SSZ represent a narrow, short-lived strip of Neo-Tethyan lithosphere which was consumed in the Senonian to Palaeocene and, in part, abducted during Eocene period.

The late Cretaceous to Tertiary rocks of the SSZ separate two structurally coherent continental blocks: "Lut block" in west and the "Afghan block" in east. Ophiolitic *mélange* is the main complex in this suture zone. The ophiolite *mélange* complex include of harzburgite, dunite, pyroxenite, serpentinite, gabbro, diabase, basalt and pelagic sedimentary rocks. listvenites (LV) as an assemblage of carbonate, silica – carbonate and silica are seen as veins, and sheets within the host rocks. LV's host rock in east of Iran, are mainly serpentanized Peridotites, but some veins are seen within gabbros and spilites, which are in contact with Cretaceous flysch-type shale and sandstones. There are some veins within the young conglomerate which covered the ophiolitic *mélange* complex.

LV veins are located in spaces that have created in tensional fractures by left _lateral shear zones. The mechanism of these shear zones are left _lateral trans-comperssional. Pressure release in these places has created suitable conduit for hydrothermal fluids and descending leaches matters to the surface or low level depths. Hydrothermal process for listvenitization should be started immediately after auto metamorphism of peridotites in the oceanic lithosphere until present time on continental crust. They evolved as products of two stages, serpentinization of ultramafic rocks followed by metasomatic hydrothermal alteration.

LV in east of Iran occurred as vein and vein lets in shear zones with a width Xcm to some hundred meters and a length of Xcm to some kilometers. These veins are structurally controlled and spatially related to serpentinized ultramafic rocks in ophiolite *mélange* complex. They are within serpentinized ultramafic and mafic rocks of ophiolitic complex, along the boundaries of these rocks and flysch type rocks and within conglomerate s with an ophiolitic base.

On the basis of mineralogy and geochemistry analysis, the LV in east of Iran are divided into three main carbonate, silica-carbonate and silica groups. Magnesite, dolomite, huntite and hydromagnesite are the major minerals in carbonate type. Silica LV contains mainly quartz, chalcedony and opal. Silica-carbonate LV contains minerals of carbonate and silica LV.

Based on field study there are four main structural features in LV in study area. A) Elongate lenses which have variable ranges from centimeter to several hundred meters width and centimeter to some kilometer length. These lenses are located in T type fractures in shear zones and parallel with maximum stress direction. B) Blocky and rhombic features which located on conjugate shear fractures spaces. C) Massive and sheet like structures. In cases which listvenite forming fluids during up warding flow through fractures and cracks had been opposite to an impermeable barrier, they developed sideways and distributed as sheet like structures. D) Brecciated features are common everywhere and show an active and progressive deformation in the shear zones. LV form hard resistant masses that crop out sporadically with the highly altered serpentinized pridotites along shear zones. They have high relief and dike shape in their host rocks and this feature is the main factor for distinguishing them easily in field trips.

The main textures are open space filling and colloidal. The carbonate LV show a sharp and rough surface morphology (elephant skin like), this morphology is out standing, particularly when the main carbonate mineral is dolomite. Spherical and kidney textures are common in silica – carbonate LV. Banding texture is regular in silica – carbonate LV, because of rhythmic deposition of silica and carbonate. Other textures in LV are chicken-wire or mesh texture, brecciated granular, cockade and rose shape. Rose shape textures are common in carbonate LV.

Key words: Silica listvenite, Silica – carbonate listvenite, Rose shape texture, Carbonate listvenite, and east of Iran