INVESTIGATION OF RINGWOODITE AGGREGATE TEXTURES IN SHOCK VEINS. Sz. Nagy[1], I. Gyollai[2], A. Gucsik[3], Sz. Bérczi[4]
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Introduction: The high-pressure mineral transformations can lead the knowing of Earth's interior. The texture investigations might be give us better understanding for the P-T-t paths in the phase transformations. The formation of high-pressure phases in the meteorites need two important effects: (1) the shock loading time and (2) high temperature which are forming the activation energy in the reconstructive phases transformation. The main leading effect is the temperature. In this study we summarize our observations on the textures of ringwoodite aggregates and we take explanation for the P-T-t conditions in this transition.

Result and Description: We have choosen an 5 mm wide shock vein in the NWA 5011 strongly shocked meteorite. The grain size in the ringwoodite aggregates is getting smaller from the center of shock-vein towards to the chondritic portion. Relict olivine was not observable the transition was complete.

We can distinguished the following texture types in the observed ringwoodite aggregates:

Complete transformation types:

(1) granular ringwoodite aggregates with rounded grains

This type contains the largest individual grains within an aggregates. The grains size is between 1-15μm. Their appearance are only in the shock veins, especially in the inner side, at the boundary region of the shock veins is not frequently. The shape of the individual grains is rounded, the grain boundaries is well visible and distinguished. The grain boundary path is irregular puzzle-like form. The aggregates consist of well developed individual nuclei.

(2) microgranular ringwoodite aggregates with rounded grains

This microgranular type contains rounded grains as well as granular type. But the grains lower limit is not visible by optical microscope. The individual grains maximum size is around 1 μm. These aggregates transformed complete without any olivine relict. This type lies on the boundary zone between the inner part of the shock vein and chondritic part. These aggregates consist of many nuclei which is cause their dark blue color. This blue color probably related to the interstitial material between the individual grains. The width of this region is just a few micrometers.

(3) granular ringwoodite aggregates with rounded and columnar grains

This type observable just in the chondritic part **(Fig. 1).** The aggregates consist of the rounded grains in the core region which have always pale-blue color, and in the outerside contains the surrounding columnar grains. The individual rounded grains size is about 1-2 μm, but the columnar grains longest dimension has about 10 μm. This type is very similar to the steel industry fast cooling system.

Partial transformed types:

(4) lamellar microgranular ringwoodite aggregates

This lamellar type has two distinguished form. The one direction lamella and the multi direction lamellae. The lamellae have in the wedge. The thickness of lamellae are maximum 3 μm. The boundary of lamellae are not straight along the host grain rather wavy.

(5) deformation related nuclei formation

This types occur far away from the shock veins. These appearance is observable in wider zones and related to the suddenly structure failure during shock.

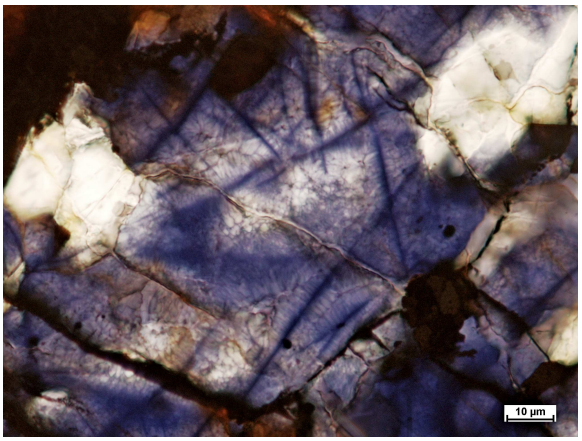

Fig. 1. Granular ringwoodite aggregates with rounded (center) and columnar grains. (OM-image)