

## **Types and Mechanisms of Alterations on the Mesozoic Ophiolites (Lake Van Region-Turkey): Petrographical and Geochemical Approach**

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Mesozoic ophiolites are widely located in the eastern part of Lake Van Basin. The ophiolitic rocks deformed during the rifting and/or closure period of the Neo-Tethyan Ocean are observed as tectonic slices in the region. These ophiolites are represented by volcano-sedimentary units, isolated dikes, and mafic-ultramafic rocks. The formation, emplacement and post-emplacement processes of these ophiolitic rocks can be understood owing to alterations as rodingitization, serpentinization, and listwaenitization. Three stages of sequent mineralization are detected in the ophiolitic rocks. First stage is pyrometasomatization, represented by metamorphic minerals (garnet, chlorite etc.), observed in intruded dikes. Second stage is hydrothermal alteration of mafic-ultramafic rocks namely serpentinization. Listwaenite alteration is the last stage of mineralization.

According to petrographical investigations, garnet+chlorite+diopside minerals are detected in rodengites. The conversion of the plagioclase minerals to the calcsilicatic minerals in rodengites suggests that these rocks are metasomatic rocks produced by Ca-rich fluids derived from serpentinization of the ultramafic rocks. The serpentine minerals (chrysotile-lizardite) can be distinguished from each other by their morphology as being platy or fibrous. Listwaenite alteration is followed by the formation of carbonate, silica, oxides and hydroxides. Chemical analysis of these rocks show that the listwaenites have an enrichment in Ni and Co contents while the rodengites have low SiO<sub>2</sub> and high CaO and MgO values (SiO<sub>2</sub> 28,50 – 36,67%, CaO 11,99 – 20,88%, and MgO 7,99 – 17,73%).

Alteration types observed on the ophiolitic rocks demonstrate that these rocks are metamorphised by low pressure and low to middle temperature conditions (greenschist facies). Serpentinization is pointing out an alteration which occurred during the emplacement of the ophiolites or the latter period.

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