



## **Geochemical, Petrological and Mineralogical Investigation of Nickeliferous Laterite Goynukbelen, Turkey.**

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The obduction and tectonically emplacement of ophiolite during late Cretaceous in the Goynukbelen terrane has acted as a potential source for the enrichment of nickeliferous laterite. These ultramafic rocks are highly susceptible to intense chemical and mechanical weathering which are very unstable at surface environment.

The lithologies of the rock unit consist of Dunite and peridotite which are unstable and metamorphosed serpentinite and lizardite which are stable ore forming minerals. The laterite is formed as a result of weathering of the above rock types with interplaying role of climate and topography. The terrane provides the ingredients for the association of laterites.

The geochemical, petrological and mineralogical associations of low grade laterite samples that are related to nickeliferous mineralization, the lithological profile of the area were studied looking at the different possible areas of enrichment of such a deposit. Weathering of olivine rich ultramafic rocks result in the breakdown of Magnesium and Silica which are replaced in the lattice with Nickel and Iron are precipitate as ferric hydroxide which form oxide deposit. Nickel bearing mineralogy, hydrous magnesium silicate, smectite, Violarite which is a supergene sulfide mineral that indicate weathering and oxidation of primary pentlandite, ullmannite which replaces awaruite in it mineral form, Nickeline, Trevorite, Rammelsbergite and gerdoffite also seen. Petrographic indication shows that serpentinization benefic the Nickeliferous ore forming process as they provide adequate texture and porosity for water channel that facilitate the hydrolysis which breakdown silica, increasing the instability of the rock while paving a way for the formation of lizardite which is an ore forming mineral. From the geochemical analyses the Nickel concentration ranges from 1000-4000PPM.

Nickeliferous laterite indicates a supergene enrichment which is favour by the ultramafic parent rock, climate and topography. Weathering influences the removal of Magnesium, and Silica which are less stable at the surface and concentrate Nickel and Iron indicating that Nickel is secondary enriched from the parent rock. Low grade of nickeliferous mineralization is accommodated by the ultramafic rocks. The nickeliferous laterite is associated with Limonite, Hematite, Magnetite and chromite within the studied area.

Key word: Nickeliferous laterite, Weathering, Serpentinite, Goynukbelen.