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GeoDay Abstract

Geochronological constraints on the geochemical evolution of the Canyon Mountain Complex ophiolite, Eastern Oregon

The majority of ophiolite sequences worldwide have now been identified as forming above subduction zones. These suprasubduction zone ophiolites can form during varying subduction processes including forearc spreading during subduction initiation, intra-arc or backarc rifting. The geochemical evolution of suprasubduction ophiolites over time has not been well constrained for all the diverse types of ophiolite systems. There are a number of possible evolutionary tracks that ophiolites may take as they evolve due to the regional tectonic regime. A number of different magma series can be detected within a single ophiolite including tholeiitic, boninitic, calc-alkaline, mid-ocean ridge and ocean island basalts. The main focus of my research will be identifying the major stages in evolution of the Canyon Mountain ophiolite of the Blue Mountains in Eastern Oregon. Then I will use major and trace element data preserved in clinopyroxene and plagioclase from each of these stages to identify how this system evolved over time. Forming time constraints on the different stages of geochemical evolution of an ophiolite from formation to obduction has yet to be thoroughly examined. This can be done by coupling geochemical trace element information preserved in the clinopyroxenes and zircons with the geochronological information that can be extracted from zircon. The Canyon Mountain Complex is presumed to be a suprasubduction zone ophiolite with an abnormally silicic character. New analytical techniques developed since the last comprehensive investigation of the Canyon Mountain Complex in 1980 can tell us more about the unit and also answer some of the questions posed by previous investigators.