# 北米フランシスカン帯の局所ホウ素同位体分析による前弧蛇紋岩の実像
# In-situ boron isotope study of forearc srpentinites from the Franciscan Complex, California

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Serpentinite is one of the characteristic rocks in convergent plate margins. What are the boron isotopic signatures of the forearc serpentinites in the Northern California Coast Ranges? Do the boron isotopic signature show regional and/or lithological differences? Does the boron isotope distinguish the tectonic origin of the serpentinite? In order to understand hydrated forearc mantle of subduction zones, we investigated twenty serpentinites form six localities (Edgewood Park, San Jose, Northern Diablo Range, New Idria, Ring Mountain and Cedars) of the Northern California Coast Range, with a specific focus on boron isotope systematics; we applied newly developed in-situ isotope analysis technique by LA-MC-ICPMS.
Boron concentration and isotpe composition of serpenines in the investigated serpentinites show a large variation (B=3-239 $\mu$g/g, $\delta^{11}$B=-12.0 to +24.4 ‰). Serpentinites with blueschist-facies high-pressure metamorphic rocks is characterized by lighter boron isotope, with negative $\delta^{11}$B values. In contrast, massive serpentinites without high-pressure metamorphic rocks show heavier boron isotope, with positive $\delta^{11}$B values. Considering the geological context and the fact that serpentinites with higher $\delta^{11}$B values are enriched in boron, the isotope trend in forearc serpentinites can be explained essentially by fluid evolution via a Rayleigh fractionation during progressive dehydration of subducting slab. However, detailed evaluations in Edgewood Park with the largest isotope variation have led to an interpretation of multi- source of fluids that have facilitated serpentinization at different environments. Moreover, a mineralogical assessment on relict mantle minerals in serpentinites found a possibility that the $\delta^{11}$B values correlate with the degree of partial melting of original peridotite before the serpentinization.

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