Contrasting spinel chemisltry in the Oligo-Miocene tholeiitic, calc-alkaline and HMA lavas in Noto Peninsula

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The upper member of the Anamizu Formation in Uchiura-Noto area is composed of a series of lavas, whose petrograpy and chemistry changes from tholeiitic, calc-alkaline and bronzite andesite in ascending order. We report chemical features of these spinel inclusions.from the three distinct magma series. The Cr# (=Cr/(Cr+Al)) of the primitive spinels from tholeiite series averages 46, those from calc-alkaline series concentrates at 59, and those from bronzite andesite are as high as 70. These data suggests progressive depletion or increase of melting degree in the source mantle from tholeiite through calc-alkaline to bronzite andesite series, but trace element and REE data indicate successive enrichment in incompatible elements in the same order.

The upper member of the Anamizu Formation in Uchiura-Noto area is composed of a series of lavas, whose petrograpy and chemistry changes from tholeiitic, calc-alkaline and bronzite andesite in ascending order. We have found many spinel inclusions in the olivine phenocrysts (mostly pseudomorphs) of the tholeiitic and calc-alkaline lavas. Although we could not find any spinel from bronzite andesite of the Uchiura-Noto area, we did find many spinel inclusions in the orthopyroxene phenocrysts in the bronzite andesite at Ishiyasumiba, Wajima City. We report chemical features of these spinel inclusions.from the three distinct magma series. In each series, spinels show Fe3+ and Ti-enrichment trend in Al-Cr-Fe3+ diagrem, while all series include ferric-poor (Fe3+/(Al+Cr+Fe3+)<0.15), primitive spinels. The Cr# (=Cr/(Cr+Al)) of the primitive spinels from tholeiite series averages 46, those from calc-alkaline series concentrates at 59, and those from bronzite andesite are as high as 70. TiO2 content of these spinels is not much different (about 1 wt.). These data suggests progressive depletion or increase of melting degree in the source mantle from tholeiite through calc-alkaline to bronzite andesite series, but trace element and REE data indicate successive enrichment in incompatible elements in the same order. We will discuss about the reasons of this apparent discrepancy and their inferences on the origin of calc-alkaline and bronzite andesite magmas