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ピジョン輝石質岩系と紫蘇輝石質岩系
Pigeonitic rock series vs. hypersthenic rock series

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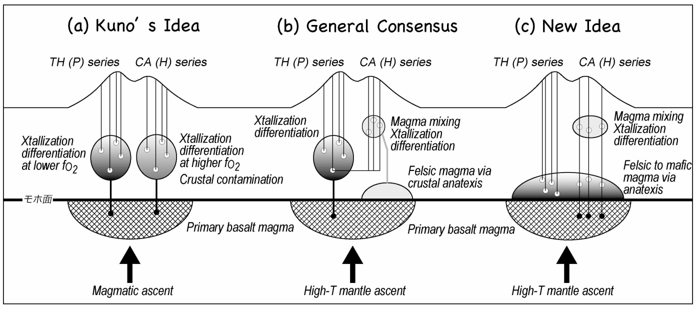
Two distinctive differentiation trends, pigeonitic and hypesthenic (P and H, hereafter), are recognized in the sub-alkalic volcanic rocks, denoting the absence or presence of orthopyroxene in a groundmass (Kuno, 1950) and correspond broadly to tholeiitic and calc-alkalic rock series (Kuno, 1960), respectively. Kuno (1959) favored a model in which P- and H-series magmas are produced from a single basaltic primary magma via crystallization differentiation under lower and higher fO2 conditions. Disequilibrium petrographic features observed characteristically in H-series rocks (e.g., Sakuyama, 1981) have led to a general consensus that these magmas form via maxing between basaltic and felsic magmas. It is generally accepted that H-series magmas may contain more crustal flavors than P-series magmas as suggested by the following observations: (1) P-series rocks are dominant in juvenile oceanic arcs, whereas H-series rocks are the major magmatic products in mature continental arcs with thicker crust and (2) H-series rocks are more enriched in 'incompatible' elements than P-series rocks. Detailed petrographic and geochemical re-examination of Quaternary volcanoes of NE Japan arc, including micro-analyses of isotopic ratios of phenocrysts, on the other hand, provides a new insight into genesis of these two magma series; the P-series magmas are produced via anatexis of lower crust caused by underplating and/or intrusion of mantle-derived basalt magmas into the sub-arc crust. The mantle-derived basalt magma mixes with crust-derived P-series melts to form H-series magmas. If this is the case, then analysis and examination of the compositions of minerals that crystallize from the primitive H-series basalt magma could provide the only chance to fully understand the geochemical characteristics of a mantle-derived magma, and hence the source mantle and slab-derived components.



キーワード: ピジョン輝石質岩系, 紫蘇輝石質岩系, ソレアイト質岩系, カルクアルカリ質岩系, 初生マグマ, マグマ分化作用
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