Basalts from Daisen volcano, Japan: Fractional crystallization versus supercooling of primary magma

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Daisen volcano, southwest Japan, has been thought to be an exclusively dacitic volcano, having a garnet signature. We studied the basalts at the west foot of the volcano and made two unexpected findings. (1) The homogeneity of 87Sr/86Sr in Daisen basalts (Sr isotopic variability 0.0003) contrasts with great variations in basalts from nearby monogenetic fields. Moreover the basalts and dacites from Daisen volcano have the same 87Sr/86Sr and 143Nd/144Nd, indicating that these rocks have a close genetic relationship. (2) Differentiation by fractional crystallization and that by supercooling were discriminated on the basis of olivine morphology and chemical relationships between olivines and host basalts.

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