

## Quaternary volcanic rocks and their assimilation of lower crust

# Takeru Yanagi[1]

[1] Earth and Planetary Sci., Kyushu Univ

At the 2001 meeting we presented that the lower crustal renewal occurred in Northeast Japan through lower crust erosion by Miocene mantle upwelling and subsequent underplating of magma generated by decompression melting associated with the mantle upwelling. We also argued that this lower crustal renewal is reflected on strontium isotopic compositions of Quaternary volcanic rocks. In contrast to Northeast Japan, the mantle upwelling was so weak that the lower crust erosion was insignificant in scale and hence the Cretaceous lower crust remained beneath the Southwest Japan arc. This is reflected as high strontium isotope ratios in Quaternary volcanic rocks in Southwest Japan. In both cases of Northeast and Southwest Japan the lower crust is gabbroic in composition, which will be discussed at this 2002 meeting.

In case of assimilation of upper crustal rocks such as sedimentary rocks, metamorphic rocks and granitic rocks of high strontium isotope ratios, the strontium isotopic ratio increases simultaneously with SiO<sub>2</sub>, Rb/Sr and 1/Sr in magma during the assimilation. The increases of strontium isotope ratios, however, does not accompany the increase of SiO<sub>2</sub>, Rb/Sr and 1/Sr. The variation range of strontium isotope ratios of Quaternary volcanic rocks is great in basalt and andesite in composition and then gradually get narrow. The strontium isotope composition finally converges to a value around 0.704 with the increase of SiO<sub>2</sub>. The variation range of strontium isotope ratios quickly increases with the increase of a Rb/Sr ratio to 0.1, passes the maximum and then gradually gets narrow with the further increase of the Rb/Sr ratio. It finally converges to a value around 0.704. The same is said to 1/Sr. These observations jointly indicate that they are produced in refilled chambers which is periodically fed with masses of magma from the mantle and in which assimilation of the gabbroic lower crust and magma crystallization continue.