

Pb,Sr and Nd isotopes of the Neogene volcanic rocks of NE Japan related with the opening of the Japan Sea

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We have analyzed Pb isotopic compositions of the Tertiary volcanic rocks of Northeast Japan which are related with the opening process of the Japan Sea basin. It is inferred from paleomagnetic studies that Northeast Japan arc made anticlockwise rotation about 50 degrees around 15Ma (Otofujii et al.,1985). On the other hand, it is proposed that the Japan Sea had started to form at least around 19-20Ma from the results of Ar-Ar dating for the basalts recovered by ODP Leg-127/128.

It should be stressed that the opening process of the Japan Sea had played an important role to change the mega-tectonic structure of the crust/ mantle of the eastern margin of Asia including the region of the Japanese Islands from the Nd-Sr isotopic results for the Tertiary volcanics of NE Japan (Nohda and Wasserburg,1986 and Nohda et al.,1988). They revealed that gradual thinning of the crust and growing of the depleted mantle around the region of the Japanese Islands based on the temporal variation of Sr and Nd isotopes from the enriched to depleted signatures.

In this study we report Pb isotopic compositions for the Tertiary volcanic rocks which were already analyzed for Sr and Nd isotopes. It is confirmed that Pb isotopes shows substantial variations through volcanic activity for these 30 my. Systematic Pb isotopic change seems to be suggestive of compositional change of the mantle from the enriched to more depleted. It should be evaluated for the degree of the involvement of the sedimentary components for the magmatic process, or variable contribution of the continental crust for magmatic activities.