

Sm-Nd mineral isochrons and trace element compositions of parent melts for Atsumi gabbroic xenoliths included in the late Miocene volcanic rocks, Atsumi area, western margin of NE Japan

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Age determination by mineral isochron method and trace element analysis were carried out for gabbroic xenoliths, included in the late Miocene volcanic rocks from the Atsumi area in order to know cumulate and parent melt pairs formed in the continental margin crust. The xenoliths are divided into clinopyroxene gabbro (GB), clinopyroxene-hornblende gabbro (PHGB), and hornblende gabbro (HGB). Eight Sm-Nd mineral isochron ages were well defined. The obtained ages are 28-32 Ma and 58-61 Ma for GB, 54-55 Ma and 66 Ma for PHGB, and 64Ma for HGB. Initial $^{143}\text{Nd}/^{144}\text{Nd}$ (NdIs) of all the xenoliths are similar in the ranges between 0.51286 and 0.51293. Initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratios (Srls), calculated using the Sm-Nd isochron ages and bulk rocks data, are 0.70323-0.70329. These NdIs and Srls are common to the values shown by basaltic rocks formed after the opening of the Japan Sea basin. Calculated trace element compositions of parent magmas for GB and PHGB samples, assuming the distribution coefficients between clinopyroxene and basaltic melt, are alkali basalt and continental arc basalt individually. It is suggested that upwelling of asthenospheric mantle had already started in Oligocene age that is the initial stage of continental rifting to form the Japan sea basin.