

Isotopic geochemistry of the Arsentyev gabbro-syenite massif

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The Arsentyev massif is confined to the intrusions of syenite-pyroxenite-gabbro formation of high titanium ultramafic-mafic association. These intrusions are related to rift-like structures of various ages and close to alkaline basalts by geochemical characteristics. The two intrusive phases, each of them being followed by formation of the dike complex rocks, form the Arsentyev massif (Badmatsyrenova et al., 2004). The first phase consists of the stratified series of pyroxenite, olivine and kersutite gabbros, gabbros, anorthosites and syenite. The second phase includes the rocks of alkali-feldspar syenite series. The coarse-grained alkaline syenites of II phase have resemblance to similar rocks Bichursky complex MZ.

Isotopic composition of gabbro and syenite of I phase were studied. The isochron lines one gave an age of 270-280 Ma with $^{87}\text{Sr}/^{86}\text{Sr}$ initial ratios from 0.70433 up to 0.70575. Isotopic characteristic are close to high-aluminous island-arc basalts ($\epsilon_{\text{Nd}} = +6$ - -2). The age of II phase syenites was determined by four whole-rock samples and monomineral separates (four fractions of feldspar). The isochron lines for syenite samples and mineral separates gave an age of 240 Ma with $^{87}\text{Sr}/^{86}\text{Sr}$ initial ratios from 0.70649 up to 0.71006.

The study of oxygen isotopic composition of monomineral samples shows that clinopyroxene and early hornblende from gabbro are characterized by the low values $\delta^{18}\text{O}$ (5,5-5,8 ‰) that testifies about mantle source parental mantle melt and absence a contamination by crustal material. Magnetites from disseminated and net-textured ores have low values $\delta^{18}\text{O}$ (2,4-2,7 ‰) indicated the mantle nature of the ore-magmatic system, genetic relationship and liquid immiscibility of ore-oxide and silicate melts, probably, in intermediate magma chamber.

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Reference

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Mantle input event in southeastern China at late Jurassic: Evidence from high ϵ_{Nd} granitoids

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Among numerous Mesozoic granitoids in southeastern China, two groups of granitoids with high $\epsilon_{\text{Nd}}(\text{T})$ values are identified.

The first group occurs in (alkaline gabbro)-syenite-granite complexes, showing shoshonitic affinity. They occur along northeast striking faults. These granitoids give positive $\epsilon_{\text{Nd}}(\text{T})$ values, identical to or slightly lower than that of the associated mafic and syenitic rocks. They are differentiated from melts directly derived from the enriched mantle or from the newly formed mafic lower crust.

The second group includes granitoids located in so-called "Shi-Hang" zone (Gilder et al., 1996), or low Nd model age zones (Chen et al., 1998), both coincide with deep faults represented by gravity gradient zones. These granitoids possess higher $\epsilon_{\text{Nd}}(\text{T})$ values ranging from -1 to -7, but, share many geochemical characteristics with granites outside the zones and having "normal $\epsilon_{\text{Nd}}(\text{T})$ values" of -7 to -10. High $\epsilon_{\text{Nd}}(\text{T})$ granites of this group are formed by the partial melting of the mixture of newly formed mantle-derived lower crust and old crustal materials, followed by strong differentiation.

The two groups of high $\epsilon_{\text{Nd}}(\text{T})$ granitoids are both 150 to 160 Ma in age based on zircon SHRIMP U-Pb, Rb-Sr and ^{40}Ar - ^{39}Ar dating.

All these high $\epsilon_{\text{Nd}}(\text{T})$ granitoids reflect an extensional tectonic environment and represent an addition of the mantle derived materials to the crust of the southeastern China at the late Jurassic. Distribution of these rocks along northeast striking faults suggests that Circum-Pacific tectonics was dominant by that time.

References

Gilder et al., (1996). *J. Geophys. Res.*, 101: 16137-16154
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