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松辽盆地早白垩世火山岩地球化学特征及其构造意义

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摘要：

松辽盆地早白垩世发育基性岩类的橄榄玄武岩、玄武岩,中性岩类的玄武安山岩、安山岩、粗安岩,酸性岩类的粗面岩、粗面英安岩、英安岩和流纹岩。早白垩世火山岩都具有大离子亲石元素(LILE)、轻稀土元素(LREE)相对富集的特征,并具有较低的$(^{87}Sr/^{86}Sr)_i$值和较高的$(^{143}Nd/^{144}Nd)_i$值。基性岩类Ce/Nb=1.92~8.31,Th/Nb=0.08~0.44,$(^{87}Sr/^{86}Sr)_i$=0.7031~0.7047,$\varepsilon_{Nd}(t)$=+1.7~+5.2; 中性岩类Ce/Nb=3.70~15.80,Th/Nb=0.34~2.58,$(^{87}Sr/^{86}Sr)_i$=0.7040~0.7054,$\varepsilon_{Nd}(t)$=0~+3.0; 酸性岩类Ce/Nb=4.29~15.80,Th/Nb=0.11~1.02, $(^{87}Sr/^{86}Sr)_i$=0.7038~0.7066,$\varepsilon_{Nd}(t)$=+1.0~+3.3。基性岩类岩浆主要来自被富集了的亏损地幔源的部分熔融,受混染程度很小; 中性岩类岩浆源于年轻地壳组分被来自亏损地幔岩浆的再次部分熔融; 酸性岩类岩浆岩可能主要来自源于亏损地幔的初生地壳部分熔融,并受到了上地壳的混染。晚侏罗世-早白垩世,由于蒙古-鄂霍次克洋关闭引发强烈的挤压造山后,发生的岩石圈拆沉作用致使来自亏损地幔的岩浆熔融上涌导致岩石圈主动伸展拉张,地表则表现出大规模的裂谷断陷作用和大范围的火山活动。这个阶段的伸展拉张以主动拉张为主。

英文摘要：

Early Cretaceous volcanic rocks from Songliao basin, Northeast China, are characterized with basic rocks (BRS) which include dorgalite and basalt, intermediate rocks (IRS) which include basaltic andesite, andesite and trachyandesite, and acid rocks (ARS) include trachyte, trachydacite, dacite and rhyolite. The major element, trace element and isotopic data of the Early Cretaceous volcanic rocks are reported in this paper. All samples have distinct characteristics with enriched large ion lithophile elements (LILE) relative to high field strength elements (HFSE), enriched light rare earth element (LREE) relative to heavy rare earth element (HREE), relatively low in $(^{87}Sr/^{86}Sr)_i$ and high in $\varepsilon_{Nd}(t)$. Additionally, BRS have Ce/Nb=1.92~8.31, Th/Nb=0.08~0.44, $(^{87}Sr/^{86}Sr)_i$=0.7031~0.7047, $\varepsilon_{Nd}(t)$=+1.7~+5.2. IRS have Ce/Nb=3.70~15.80, Th/Nb=0.34~2.58, $(^{87}Sr/^{86}Sr)_i$=0.7040~0.7054, $\varepsilon_{Nd}(t)$=0~+3.0 and ARS have Ce/Nb=4.29~15.80, Th/Nb=0.11~1.02, $(^{87}Sr/^{86}Sr)_i$=0.7038~0.7066, $\varepsilon_{Nd}(t)$=+1.0~+3.3, respectively. According to their geochemical characteristics, the magmas of BRS were generated partial melting of the depleted mantle which have been enriched, with little contaminated by crust. The generation of IRS magmas origined from melting of juvenile crust components underplated by upwelling of depleted mantle and the magmas of ARS derived from partial melting of juvenile crust components which origined from depleted mantle with contaminated by supracrust. Conclusionally, the dynamic model of stretch and extension in Late Jurassic-Early Cretaceous in Songliao basin was a result, from partial melting depleted mantle induced by delamination of thickened subcontinental mantle root induced by orogenesis with Okhotsk-Mongolia ocean closure. The rift-extensional tectonic setting of Songliao basin showed active rift characteristics.

关键词：松辽盆地 早白垩世 火山岩 地球化学特征 构造意义

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