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会昌早白垩世橄辉玄武岩(shoshonite)成因的元素及Sr-0-Nd-Pb同位素地球化学证据 [点此下载全文](#)

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摘要:

根据赣南会昌地区中基性火山岩高碱、富钾、低钛、贫铁, 岩石中斜长石斑晶具钾长石环边, 基质中存在大量钾长石微晶, 以及富集轻稀土元素和大离子亲石元素等矿物 岩石地球化学特征, 确切厘定会昌地区的中基性火山岩为橄辉玄武岩-安粗岩组合, 属典型的大陆板内橄辉玄武岩系列火山岩。对会昌橄辉玄武岩进行了Rb-Sr同位素定年研究, 确定其全岩Rb-Sr等时线年龄为 $107.3 \pm 2.3$  Ma。会昌橄辉玄武岩系火山岩Sr-0-Nd-Pb同位素组成的特征为: 偏高的 $\epsilon_{\text{Nd}}(t)$  (0.7098-0.7115); 较低的 $\delta^{18}\text{O}$ 值(5.3‰-7.0‰); 中等的 $\epsilon_{\text{Nd}}(t)$  (-0.61~-3.60); 富放射性成因铅( $^{206}\text{Pb}/^{204}\text{Pb}$ ) $i = 17.32$ -18.29, ( $^{207}\text{Pb}/^{204}\text{Pb}$ ) $i = 15.34$ -15.65, ( $^{208}\text{Pb}/^{204}\text{Pb}$ ) $i = 37.51$ -38.60)。会昌橄辉玄武岩的 $\Delta 7/4\text{Pb}$ 值为-7.8~+16.8(平均值为+5.42),  $\Delta 8/4\text{Pb}$ 值为27.3-97.3(平均值为68.04),  $\Delta \text{Sr}$ 值为96.2-114.1(平均值为104.3), 这表明存在典型的Dupal同位素异常。根据Sr-0, Sr-Nd, Sr-Pb, Nd-Pb, Pb-Pb同位素相关特征, 判明会昌橄辉玄武岩是由亏损地幔端元(DM)和岩石圈富集地幔端元(EM)在源区混合形成的。按Sr-Nd双变量二元混合模型计算得出源区物质中亏损地幔端元和富集地幔端元所占份额各占50%左右。会昌早白垩世橄辉玄武岩系火山岩带的形成反映了华南板块内部在燕山晚期发生的一起重要的伸展构造事件

关键词: [橄辉玄武岩](#) [Sr-0-Nd-Pb同位素](#) [岩石圈富集地幔端元EM](#) [Dupal同位素异常](#) [赣南会昌](#)

Geochemical evidence of element and Sr-0-Nd-Pb isotopes for petrogenesis of the Huichang Early Cretaceous shoshonite, southern Jiangxi province [Download Fulltext](#)

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Abstract:

The intermediate basic volcanic rocks in the Huichang area of southern Jiangxi province are characterized by: high total alkalis, enrichment of K<sub>2</sub>O, low TiO<sub>2</sub> content, low iron content and the enrichment of LREE and LILE elements. In combination with the mineralogical features such as the appearance of orthoclase rims along the plagioclase boundary and the existence of orthoclase micro-crystals in the groundmass, it is identified to be shoshonite-latitude association and belong to typical interplate shoshonitic volcanic rock series. The Rb-Sr isochron age of the Huichang shoshonite series (HSS) is  $107.3 \pm 2.3$  Ma. The Sr-0-Nd-Pb isotope compositions of HSS are characterized by the follows: distinctive high initial Sr isotopic ratios ( $\epsilon_{\text{Nd}}(t) = 0.7098$ -0.7115); low  $\delta^{18}\text{O}$  value (5.3‰-7.0‰); intermediate initial Nd isotopic ratios ( $\epsilon_{\text{Nd}}(t) = -0.61$ - $-3.60$ ); enrichment of radiogenic lead ( $^{206}\text{Pb}/^{204}\text{Pb}$ ) $i = 17.32\%$ -18.29%, ( $^{207}\text{Pb}/^{204}\text{Pb}$ ) $i = 15.34$ -15.65, ( $^{208}\text{Pb}/^{204}\text{Pb}$ ) $i = 37.51$ -38.60). The HSS have obvious Dupal anomaly ( $\Delta 7/4\text{Pb} = -7.8$ ~+16.8, averagely +5.42);  $\Delta 8/4\text{Pb} = 27.3$ -97.3 (averagely 68.04);  $\Delta \text{Sr} = 96.2$ -114.1 (averagely 104.3)). The Sr-0, Sr-Nd, Sr-Pb, Pb-Pb relationships of HSS strongly suggest a mixing source of the depleted mantle endmember with the lithosphere enriched mantle endmember. According to double variation and two component (Sr-Nd) mixing equation, calculation shows that the depleted mantle endmember and the lithosphere enriched mantle endmember are about 50% for rock-forming materials of HSS. The existence of the Huichang Early Cretaceous shoshonitic volcanic rock belt implies a major extensional tectonic event during the Late Yanshanian period

Keywords: [Shoshonite](#) [Sr-0-Nd-Pb isotopes](#) [lithosphere enriched mantle endmember EM](#) [Dupal anomaly](#) [Huichang of southern Jiangxi province](#)

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