

大别山超高压变质带燕山期花岗岩地球化学特征及成因探讨

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摘要: 依据花岗岩类的岩性组合、产出状况、结构、侵位机制和地球化学特征等, 将大别山超高压变质带中燕山期花岗岩大致可以划分为两大类: 一类为高钾钙碱性系列, 以大同岩体和司空山早、主期岩体为代表, 岩性为花岗闪长岩—二长花岗岩, 表现为 $\text{SiO}_2 > 56\%$, Al_2O_3 一般 $\geq 14\%$, $\text{MgO} < 3\%$, 富集LREE, 低HREE和Y、Yb(如 $Y < 18 \times 10^{-6}$, $Yb < 1.9 \times 10^{-6}$), 高Sr、Ba, 高 $\text{La/Yb} > 39$ 和 $\text{Sr/Y} \geq 30$, Sr、Eu异常不明显, 与Adakite岩相似; 另一类属正常钙碱性系列, 以英山尖岩体为代表, 岩性以二长花岗岩为主, 具有高硅、低铝的特点, 一般 $\text{SiO}_2 > 70\%$, $\text{Al}_2\text{O}_3 < 14\%$, LREE略显亏损, HREE略显富集和高Y、Yb(如 $Y > 18 \times 10^{-6}$, $Yb > 1.9 \times 10^{-6}$), 低Sr和 $\text{La/Yb} < 10$, $\text{Sr/Y} < 10$, Sr、Eu负异常明显。高钾钙碱性花岗岩可能为增厚的下地壳部分熔融的产物, 正常钙碱性花岗岩可能为正常的地壳重熔形成。

关键词: 花岗岩; 高钾钙碱性系列; 燕山期; 超高压变质带; 大别山

中图分类号: P595 文献标识码: A 文章编号: 1000-3657 (2004) 02-0147-08

Geochemical characteristics and genesis of Yanshanian granite in the Dabie ultrahigh-pressure (UHP) metamorphic belt

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Abstract: According to the rock composition, occurrence, textures, emplacement mechanism and geochemical characteristics, the Yanshanian granitoids in the Dabie UHP metamorphic belt may be classified into two major types: the high-K calc-alkaline series and the normal calc-alkaline series. The high-K calc-alkaline series is represented by the Datong rock body and the early-stage and main-stage Sikongshan rock bodies and composed lithologically of granodiorite-monzogranite. The chemical composition is characterized by $\text{SiO}_2 > 56\%$, $\text{Al}_2\text{O}_3 \geq 14\%$, $\text{MgO} < 3\%$, high Sr and Ba contents, enrichment in LREE, strong depletion in HREE, high Sr/Y and La/Yb ratios (≥ 30 and ≥ 39 , respectively), low Y ($< 18 \times 10^{-6}$) and Yb ($< 1.9 \times 10^{-6}$) contents, and indistinct Eu and Sr negative anomalies. These characteristics are similar to those of adakite. The normal calc-alkaline series is represented by the Yingshanjian rock body, consisting dominantly of monzogranite. It is characterized by high $\text{SiO}_2 (> 70\%)$, low $\text{Al}_2\text{O}_3 (< 14\%)$, low Sr and Ba contents, low Sr/Y (< 10) and La/Yb (< 10) ratios, high Y ($> 18 \times 10^{-6}$) and Yb ($> 1.9 \times 10^{-6}$) contents, depletion in LREE, enrichment in HREE, and pronounced negative Sr and Eu anomalies. The high-K calc-alkaline granites might be derived by partial melting of the thickened lower crust, while the normal calc-alkalis granites probably originated by anatexis of the normal crust. Key words: granites; high-K calc-alkali series; Yanshanian; ultrahigh-pressure metamorphic belt; Dabie Mountains