铜陵矿集区燕山期中酸性侵入岩地球化学特征及其地质意义

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中文摘要:铜陵矿集区燕山期中酸性侵入岩由橄榄玄粗质系列和高钾钙碱性系列岩石组成,两者的岩石化学和地球化学特征存在差异,相互间不存在岩浆分异演化关系.稀土和微量元素以及O、Pb、Sr、Nd同位素研究表明,高钾钙碱性系列侵入岩的原始岩浆以下地壳深变质岩部分熔融岩浆为主,在有幔源玄武质岩浆注入的情况下先于橄榄玄粗质系列岩浆侵位形成;起源于富集地幔的碱性玄武岩与有限的地壳物质发生同化混染并通过结晶分异作用(AFC)形成了橄榄玄粗质系列侵入岩.下地壳或岩石圈地幔拆沉继而环流热幔上涌是本区侵入岩形成的直接起因;同时,侵入岩浆的强烈活动也是本区构造环境由挤压向伸展转换的标志.

中文关键词:侵入岩 橄榄玄粗质系列 高钾钙碱性系列 构造环境 铜陵矿集区

Geochemical Characteristics of the Yanshanian Intermediate-acid Intrusive Rocks in the Tongling Mineralization Concentration Area, Anhui Province, and Their Geological Implications

Abstract:The intermediate-acid intrusive rocks in the Tongling mineralization concentration area can be divided into two series without magmatic differentiation relationship, i.e., shoshonite series (SiO_2<56%) and high-K calc-alkaline series (SiO_2>56%). Geochemical characteristics of the two series are obviously different from each other. The characteristics of the rare earth elements, trace elements, and oxygen, lead, strontium and neodymium isotopes of the two series were studied in detail. On such a basis, it is held that the original magma of the high-K calc-alkaline series was mainly the partial melting material of old metamorphic basement rocks. It was mixed with basaltic magma of the mantle, followed by the emplacement before the emplacement of other rocks. The primal magma of the shoshonite series was alkaline basalt which originated from the enriched mantle and then underwent assimilation, fractionation and crystallization. Delamination of the lower crust or the lithospheric mantle followed by upward migration of the thermal mantle was caused directly by the intrusive rocks. The intrusive magmatic activities were indicators of the tectonic setting which changed from compression to extension.

keywords:intrusive rocks shoshonite series high-K calc-alkaline series tectonic setting Tongling