

向运川, 龚庆杰, 刘荣梅, 杨万志. 2014. 区域地球化学推断地质体模型与应用——以花岗岩类侵入体为例. 岩石学报, 30(9): 2609-2618

区域地球化学推断地质体模型与应用——以花岗岩类侵入体为例

作者	单位
向运川	中国地质调查局发展研究中心, 北京 100037
龚庆杰	中国地质大学地质过程与矿产资源国家重点实验室, 北京 100083
刘荣梅	中国地质调查局发展研究中心, 北京 100037
杨万志	新疆维吾尔自治区地质调查院, 乌鲁木齐 830000

基金项目: 本文受国家重点基础研究发展规划(2009CB421008)、中国地质调查全国矿产资源潜力评价(1212011121039)、北京市优秀博士学位论文指导老师科研项目(20111141501)和高等学校学科创新引智计划(B07011)联合资助。

摘要:

区域化探全国扫面计划获得的海量地球化学数据在基础地质和矿产勘查研究中已发挥了重要作用。全国矿产资源潜力评价化探工作组将全国陆地国土划分为5个地球化学域(古亚洲地球化学域、秦祁昆地球化学域、特提斯地球化学域、扬子地球化学域和滨太平洋地球化学域)和25个地球化学省。在全国地球化学图中位于云南西部地区的花岗岩类侵入体具有显著富 K_2O 、Th、U、La、Y、Zr而贫Co、Ni、V、Cr、Ti、 Fe_2O_3 的特征。基于云南西部地区区域化探数据利用因子分析确定了高场强元素组合(F2)和相容元素组合(F1)两个公因子: $F2=0.87Th+0.86Y+0.77U+0.77Zr+0.67La+0.61K_2O+0.58Al_2O_3+0.53Be$, $F1=0.95Fe_2O_3+0.93V+0.93Ti+0.92Co+0.81Cr+0.80Ni$ 。利用二者因子得分比值(F2/F1)构建了推断花岗岩类侵入体的区域地球化学综合指标和推断模型。以F2/F1为例介绍了制作地球化学图和地球化学异常图的方法技术。在F2/F1地球化学图中的高值区或在其他地球化学异常图中的异常区与云南西部地区花岗岩类侵入体的地表出露范围十分吻合,从而验证了地球化学推断花岗岩类侵入体模型的可行性。基于构建的推断模型在全国近7百万平方千米的范围内进行推演并绘制F2/F1的地球化学图和地球化学异常图。选择华南中部地区进行详细分析,结果发现模型指标异常区与实测花岗岩类侵入体在空间形态和规模上十分吻合,尤其在韶关至桂林、贺州一带花岗岩类侵入体边界与F2/F1异常区边界几乎一致。这一结果不仅证实了针对花岗岩类侵入体所建立的区域地球化学推断模型的可行性,而且该模型在基础地质研究方面具有潜在应用价值。

英文摘要:

The geochemical survey data obtained by the RGNR (Regional Geochemistry-National Reconnaissance) project are useful for basic geology research and mineral exploration. Based on the China's National Geochemical Mapping, five geochemical domains (Pal-Asia geochemical domain, Qingling-Qilian-Kunlun geochemical domain, Tethys geochemical domain, Yangtze geochemical domain and Marginal Pacific geochemical domain respectively) and 25 geochemical provinces are divided in Chinese land surface. In the western of Yunnan Province, granitic intrusions occurring in arc belt clearly are rich in K_2O , Th, U, La, Y, Zr, but poor in Co, Ni, V, Cr, Ti, and Fe_2O_3 . Geochemical survey data in the western of Yunnan Province are precessed on the main component factor analysis method and two main factors are selected. One or F2 represents the element assemblage of Th, Y, U, Zr, La, K_2O , Al_2O_3 , and Be, which factor score is calculated as $F2=0.87Th+0.86Y+0.77U+0.77Zr+0.67La+0.61K_2O+0.58Al_2O_3+0.53Be$. The other or F1 represents the element assemblage of Fe_2O_3 , Ti, V, Co, Cr, and Ni, which factor score is $F1=0.95Fe_2O_3+0.93V+0.93Ti+0.92Co+0.81Cr+0.80Ni$. The ratio of these two factor scores is used to deduce the granitic intrusions. The drawing methods of geochemical map and geochemical anomaly map are presented which are used commonly in the RGNR project. The areas of F2/F1 with high values and the anomaly areas of F2/F1 coincide well with the outcrops of granitic intrusions in the western of Yunnan Province. The deducing model to recognize granitic intrusions based on geochemical survey data in the western of Yunnan Province is fulfilled in the Chinese land surface with ca. 7 million square kilometers. The middle part of South China is selected to test and apply the deducing model. The results indicate that the anomaly areas of the factor score ratio F2/F1 are consistent well with the outcrops of granitic intrusions in the middle part of South China, especially in the boundary areas of Hunan Province, Guangdong Province and Guangxi Zhuang Autonomous Region. This consistence indicates that the deducing model is feasible to recognize granitic intrusions. This model will play an important potential role on basic geology research in China.

关键词: [区域地球化学](#) [推断模型](#) [花岗岩类侵入体](#) [地球化学省](#) [全国地球化学图](#)

投稿时间: 2014-02-10 最后修改时间: 2014-04-24

黔ICP备07002071号-2

主办单位：中国矿物岩石地球化学学会

印刷版(Print): ISSN 1000-0569 网络版(Online) : ISSN 2095-8927

单位地址：北京9825信箱/北京朝阳区北土城西路19号

本系统由北京勤云科技发展有限公司设计

linezing.com

手机扫一扫

