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三论花岗岩按照Sr-Yb的分类:应用

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摘要:

在“再论”中我们提出了花岗岩按照Sr-Yb分类的新标志(张旗等, 2010a), 本文进一步讨论该分类的应用。文中举了国内外许多实例(包括柴达木、北祁连、内蒙古、松潘-甘孜、大别、太行、华北古元古代和华南新元古代以及土耳其、俄罗斯、巴西、刚果、波西米亚、意大利等), 着重讨论了花岗岩Sr和Yb含量与其形成压力和深度的关系, 指出本分类最重要的地球动力学意义在于与其形成的深度有关, 并在一定条件下与其产出地区的地壳厚度有关。例如应用本方法分析华北克拉通古元古代花岗岩, 很难得出该带在古元古代发生过碰撞的结论, 华北克拉通是否分为东西两块也需要重新认识。又如对华南新元古代花岗岩的分析表明, 华南地块内部在新元古代时地壳较薄, 但是, 与Rodinia大陆的裂解似乎无关。文中还对花岗岩与成矿的关系进行了讨论, 提出成矿与压力有关的概念。如金铜与地壳厚度大的埃达克型和喜马拉雅型花岗岩有关, 钨锡与地壳厚度薄的南岭型花岗岩有关, 而不论矿床是什么类型的, 只要它们与花岗岩有关, 必定受矿液源区深度的控制, 要么是在加厚地壳的地球动力学背景下, 要么是在地壳减薄的地球动力学背景下。花岗岩无比复杂, 我们用Sr和Yb两个元素对花岗岩重新进行了分类, 只是一个探索性的尝试, 问题肯定不少, 需要广泛的实践的检验, 需要深入的实验研究的检验, 需要理论的探讨, 需要经过一系列否定-肯定-否定的过程, 才能逐渐臻于完善。

英文摘要:

In this study, we test the reliability of new classification of granitic rocks based on Sr and Yb concentrations of granitic rocks that we suggested in our previous study (Zhang *et al.*, 2010a). A large data set of granitic rocks worldwide including those from Qaidam, the North Qilian, the Inner Mongolia, Songpan-Ganze, the Dabai Mountains, the Taihang Mountains, and Paleoproterozoic granitic rocks in the North China and Neoproterozoic granitic rocks in South China Block, and those from Turkey, Russia, Brazil, Congo, Bohemia and Italy are used to examine the relationship of the Sr and Yb concentrations of granitic rocks and their formation pressure and depth. The data indicate that the variation of granitic rocks in Sr and Yb concentrations is closely related to the pressure when they formed, which can be used to estimate the variation of the thickness of the crust. Such as the Paleoproterozoic granites in the North China by this method to study, not found in central North China Craton occurred collision in the Paleoproterozoic. Therefore, the North China Craton was divided into two blocks need to be further re-understanding. Another example is the the Neoproterozoic granite in South China Block. Our study shows that crust of the South China Block is thin during the Neoproterozoic, and however, it seems irrelevant with rifting-reakeup of the supercontinent Rodinia. The data also indicate that the different mineralization associated with granitic rocks is also related to pressure. Cu-Au mineralization is commonly hosted in adakitic-type and Himalaya-type granitic rocks which likely formed from thickened lower crust, whereas W-Sn mineralization is usually hosted in Nanling-type granitic rocks which formed from shallower crust. However, such classification based on Sr and Yb concentrations of granitic rocks needs more test in both practice and theory before it can be accepted by confidence.

关键词: [花岗岩Sr-Yb分类](#) [应用](#) [地壳厚度](#) [金铜成矿](#) [钨锡成矿](#)

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