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福建潘田铁矿床花岗岩岩石地球化学特征、锆石U-Pb年代学及其与成矿的关系

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摘要:

潘田铁矿床矿体主要赋存于潘田花岗岩体外接触带的“硅钙岩性界面”中,其成矿与花岗岩侵入关系密切,是一个具有很大找矿潜力的富铁矿床。但前人对该花岗岩的研究还很薄弱,本文对潘田铁矿花岗岩进行了岩石地球化学特征、锆石U-Pb定年研究,探讨其岩石成因、形成时代、构造环境、及其与成矿的关系。LA-ICP-MS锆石U-Pb定年获得其结晶年龄为 $131.68 \pm 0.48\text{Ma}$ 。该岩体为高钾钙碱性系列,属弱过铝质-准铝质岩石;稀土元素总量较低,轻稀土相对于重稀土富集,具有明显铕负异常,重稀土配分模式相对平坦,中稀土相对亏损。微量元素中相对富集大离子亲石元素而亏损高场强元素。岩石地球化学特征表明潘田岩体为高分异I型花岗岩,形成于碰撞后拉张环境。潘田铁矿床矿体与花岗岩体的空间分布规律与成因关系表明,花岗岩侵入作用是控制主成矿阶段矿体空间定位的地质作用,花岗岩是铁矿床的成矿地质体,林地组碎屑岩与黄龙组-栖霞组碳酸盐岩的接触界面是成矿有利部位,矿床类型属于典型“硅钙岩性界面”成矿,本矿床的成因类型属于“多因耦合、临界转换、边界成矿”的典型案例。

英文摘要:

The Pantian iron ore deposit is a high-grade iron deposit with great prospecting potential. The orebodies mainly occur in silico-calcium lithologic boundaries in the outer contact zone of the granite, and the mineralization is closely related to the granitic intrusion. But there were little study on the granite. Therefore, petrogeochemistry characteristics and zircon U-Pb age of the granite is studied in this paper to discuss its petrogenesis, tectonic setting, emplacement age and the relationship with the iron ore mineralization. The LA-ICP-MS zircon U-Pb dating of the granite indicates that the granite intruded in Early Cretaceous ($131.68 \pm 0.48\text{Ma}$, MSWD=1.3). The granite is characterized by high-K calc-alkaline series and weakly peraluminous-metaluminous rocks, and has a moderate smooth REE pattern characterized by lower ΣREE , higher LREE than HREE, and obvious negative Eu anomalies, and has an intensive enrichment in LILE and different depletion in HFSE. The petrogeochemical analysis shows that Pantian granite belongs to highly fractionated I-type granites and forms on the post-collisional extensional environment. By analyzing the spatial distribution rule and genetic relation between iron orebodies and the granite, we infer that the granite intrusion determine the spatial orientation of main ore bodies, and the granite is the metallogenic geological body of Pantian iron ore deposit which is the typical silicon-calcium mineralization. The lithologic boundaries between the clastic rocks of Lindi Formation and carbonate rocks of Huanglong-Qixia formations are the beneficial ore-forming positions. And the deposit we study in this paper belongs to the typical metallogenic mechanism of "multi-factor coupling, critical transformation, and marginal metallogenesis".

关键词: [高分异I型花岗岩](#) [锆石U-Pb年代学](#) [硅钙岩性界面](#) [铁矿床](#) [潘田](#)

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