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庐枞盆地高温铀钍矿化特征、成因及其找矿意义——来自砖桥科学深钻ZK01的证据

作者 单位

[熊欣](#) [中国地质科学院矿产资源研究所, 国土资源部成矿作用与资源评价重点实验室, 北京 100037](#)

[徐文艺](#) [中国地质科学院矿产资源研究所, 国土资源部成矿作用与资源评价重点实验室, 北京 100037](#)

[杨竹森](#) [中国地质科学院矿产资源研究所, 国土资源部成矿作用与资源评价重点实验室, 北京 100037](#)

[贾丽琼](#) [中国地质大学地球科学学院, 北京 100083](#)

[李骏](#) [中国地质科学院矿产资源研究所, 国土资源部成矿作用与资源评价重点实验室, 北京 100037](#); [中国地质大学地球科学学院, 北京 100083](#)

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摘要:

砖桥科学深钻ZK01孔位于庐枞盆地中部。详细的室内外工作表明, 钻孔深部(1500~1900m)的正长岩和二长岩内发育强烈蚀变和铀钍矿化, 蚀变类型主要有钾长石化、钠长石化、电气石化和硬石膏化。蚀变矿化过程包括5个阶段, 即I绿色电气石+钾长石+硬石膏阶段, II粉红色电气石+硬石膏+铀钍矿化阶段, III黑色电气石+硬石膏+铀钍矿化阶段, IV硬石膏+黄铁矿+黄铜矿阶段, V石膏+方解石+石英阶段, 其中铀钍矿化发生在第II和第III阶段, 以形成铀钍矿、铀钍石和晶质铀矿为特征。流体包裹体测温结果显示, 第I阶段流体包裹体均一温度平均为548.2℃, 盐度平均为41.04% NaCleqv; 第II阶段的流体包裹体均一温度平均为339.6℃, 盐度平均为10.53% NaCleqv; 第III阶段流体包裹体均一温度平均为308.6℃, 盐度平均为11.48% NaCleqv; 第IV阶段流体包裹体均一温度平均为183.7℃, 盐度平均为9.56% NaCleqv; 第V阶段流体包裹体均一温度平均为133.7℃, 盐度平均为5.16% NaCleqv。上述特征表明, 深钻内的铀钍矿化具有高温热液铀钍矿化特征, 矿化与沿罗河深断裂入侵的深源正长岩和二长岩侵位相关, 高温、高盐度岩浆流体在体系向开放状态转变时发生沸腾, 导致铀和钍沉淀而矿化。深钻内高温铀钍矿化的首次发现和证实, 为庐枞盆地铀钍找矿提供了新思路。

英文摘要:

Scientific deep drilling named ZK01 of Zhuanqiao lies in the centre of Luzong. Based on a series of work, uranium and thorium mineralization is in syenites and monzonites (1500~1900m) of ZK01 associated with albitization, feldspar, tourmaline and anhydrite. The alteration and mineralization can be divided into five stages, green-tourmaline+feldspar+anhydrite at stage I, pink-tourmaline+anhydrite+uranium-thorium mineralization at stage II, black-tourmaline+anhydrite+uranium-thorium mineralization at stage III, anhydrite+copper+pyrite at stage IV and gypsum+calcite+quartz at stage V. Uranium and thorium mineralization are occurred as brannerite, uraninite and uranothorite and formed at stage II and III. The results indicate that the average of homogeneous temperature at stage I is 548.2℃ and salinity is 41.04% NaCleqv; the average of homogeneous temperature at stage II is 339.6℃ and salinity is 10.53% NaCleqv; the average of homogeneous temperature at stage III is 308.6℃ and salinity is 11.48% NaCleqv; the average of homogeneous temperature at stage IV is 183.7℃ and salinity is 9.56% NaCleqv; the average of homogeneous temperature at stage V is 133.7℃ and salinity is 5.16% NaCleqv. These features mentioned above suggest that the uranium and thorium mineralization are characterized as the hypothermal fluid mineralization and associated with deep syenite and monzonite intrusion by Luo-He fault. Boiling had already occurred several times during ore-forming evolution and may be the dominated factor for metal precipitation. Uranium and thorium mineralization which was discovered and confirmed in the first place provides a new idea for uranium prospecting in Luzong basin.

关键词: [铀钍矿化](#) [高温热液](#) [流体包裹体](#) [庐枞盆地](#)

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