

闫臻,王宗起,李继亮,许志琴,邓晋福. 2012. 西秦岭楔的构造属性及其增生造山过程. 岩石学报, 28(6): 1808-1828

西秦岭楔的构造属性及其增生造山过程

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基金项目: 本文受国家自然科学基金项目(40772137)、国家科技支撑计划课题(2011BAB04B05、2006BAB01A11)和中国地质调查局地质调查项目(1212010911033、1212011120159)联合资助。

摘要:

西秦岭楔是叠置于早古生代造山作用基础上形成的并插入祁连和昆仑早古生代造山带内部的楔形地质体,以大面积出露三叠系并发育多条蛇绿混杂岩带、大型韧性剪切带、中生代火山-岩浆作用和斑岩-矽卡岩型矿床为典型特征,具有增生造山作用的典型特征。这些蛇绿混杂岩带和岛弧钙碱性火山-岩浆岩的形成时代均具有向南逐渐变年轻的空间演化特征,显示了特提斯洋演化过程中海沟具有向南撤退的基本特征。砂岩碎屑组成以及源区特征研究结果表明,西秦岭楔三叠系形成于活动大陆边缘,其碎屑沉积物来自于古特提斯洋北侧的增生杂岩及岛弧。丰富的岛弧钙碱性火山-岩浆岩和沉积组合以及赋存的斑岩-矽卡岩型矿床,均与东昆仑及南秦岭相一致,呈现出相似的岩石组合类型以及岩石地球化学和同位素地球化学特征。这些事实表明,三叠纪时期,东昆仑、西秦岭以及祁连造山带是一个有机整体,自西向东存在一条三叠纪增生岩浆弧。锆石 Hf 同位素及岩石地球化学成分结果则表明,该增生岩浆弧部分岩浆来自于俯冲增生杂岩的部分熔融。

英文摘要:

The West Qinling Terrane, which was formed and superimposed on the Early Paleozoic orogen and plunged into the Qilian and Kunlun orogenic belts, is a typical accretionary orogen and characterized by a plurality of ophiolitic melanges, large-scale shear zones, Mesozoic volcanic-magmatism, and abundant porphyry-skarn deposits, showing an inverted triangular shape in the geological map of the Tibet Plateau and adjacent area. The ages of these ophiolitic melange and island-arc related volcanic and granitoid rocks with calc-alkaline geochemical affinities are younger to the south, implying a southward retreat of the trench during the evolution of the Tethys. Detrital framework and source area of Triassic sandstone samples suggest that deposition in an active continental margin which is originated from the accretionary complex and arc rocks in the northern margin of the Tethys. Petrological assemblage, petrogeochemistry and isotope geochemistry of these arc-related volcanic-granitoid rocks and porphyry-skarn deposits in the West Qinling Terrane are very similar to that of the East Kunlun and South Qinling. These facts indicate that East Kunlun, West Qinling and Qilian orogenic belts should have united and an EW-trending magmatic arc should also formed in the Triassic. Hf isotopic data of the zircons and geochemistry of the arc-related granitoids suggest that some magmatism should be derived from the melting of the subduction-accretion complex.

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投稿时间: 2012-02-21 最后修改时间: 2012-05-07

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黔ICP备07002071号-2

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本系统由北京勤云科技发展有限公司设计

