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黑龙江杂岩的碎屑锆石年代学及其大地构造意义

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摘要:

黑龙江杂岩带位于佳木斯地体西缘,为佳木斯地体向西与松嫩地体之间俯冲、拼贴、碰撞而形成的高压变质带。黑龙江杂岩沿牡丹江断裂分布,其构造-岩石组合、变质变形特征等显示其为佳木斯地体向松嫩地体俯冲拼贴的过程中形成的增生杂岩,目前保存下来的杂岩带应为大规模增生楔仰冲到佳木斯地体之上的残余部分。88颗碎屑锆石的全部样品SHRIMP U-Pb年代学测试结果显示三个主要年龄区间: 170~220Ma, 峰值年龄为183Ma; 240~338Ma, 峰值年龄为256Ma; 450~520Ma, 峰值年龄为470Ma。而28个碎屑锆石谐和年龄的年龄谱为两组: 240~338Ma, 峰值年龄为256Ma; 450~500Ma, 峰值年龄为470Ma。碎屑锆石年龄数据分析得到,240~338Ma峰期年龄为256Ma的年龄谱代表黑龙江杂岩主体岩石的沉积年龄上限; 而450~500Ma的年龄谱对应于佳木斯地体的基底变质岩年龄,显示佳木斯地体的基底变质岩曾为黑龙江杂岩的物源区; 而170~210Ma, 峰期年龄为183Ma的不谐和年龄应为受印支期-早侏罗世构造热事件的扰动年龄,与该区变质单矿物的Ar-Ar年龄相一致,应代表了该区陆-陆碰撞的时代。上述年龄为黑龙江杂岩的形成与演化提供了重要的地质年代学制约,即黑龙江杂岩的原岩成岩时代上限为早三叠世,佳木斯地体向西的俯冲时代主体为印支期,而陆-陆拼贴及碰撞过程主要为晚印支期并可能持续到早侏罗世。这些结果将为揭示我国东北地区构造演化的年代学格架以及三叠纪古亚洲构造域向环太平洋构造域叠加和转换的动力学背景研究提供新的基本地质事实依据。

英文摘要:

Heilongjiang complex, along the Mudanjiang fault in the western part of the Jiamusi massif, was the high-pressure metamorphic belt due to the collision between the Jiamusi and Songnen massifs. According the tectonic-rock assemblages, metamorphism and deformation characteristics, the Heilongjiang complex are the similar to the residual parts of the huge accretionary wedge, which was overthrust above the Jiamusi massif during the late stage of the collision between the two massifs. SHRIMP U-Pb dating from 88 zircon analyses give the three age populations: 170~220Ma with peak age at 183Ma, 240~338Ma with the peak age at 256Ma and 450~520Ma with peak age at 470Ma. The 28 zircon spots with the concordant ages give the two age populating: 240~338Ma with peak age at 256Ma and 450~500Ma with peak age at 470Ma. The age populations of the 240~338Ma with peak age at 256Ma is the ages for limited the deposition age of the Heilongjiang complex. Oldest age populations of the 450~520Ma with peak age at 470Ma are similar to the Mashan complex, and suggests that the Mashan complex was the marital source. The youngest age populations of the 170~220Ma with peak age at 183Ma, is the discordant ages but is similar to the Ar-Ar ages from muscovite in the Heilongjiang complex, which indicate that the ages of the thermal perturbation due to the collision between the Jiamusi and Songnen massifs. We suggests that the protolith age of the Heilongjing complex are at Early Triassic, the timing for collision between the two massifs and the overtrusting of Heilongjiang HP rocks on to the Jiamusi massif was Late Triassic to Early Jurassic, therefore the subduction between the two massifs should be during the Triassic. Those SHRIMP U-Pb dating not only show the geochronology framework in the NE China, but also give an important evidence for the transformation between the Paleozoic Central Asian Orogenic Belt (CAOB) and the Pale-Pacific Accretion Belt (PPAB) during the Triassic.

关键词: [黑龙江增生杂岩](#) [蓝片岩](#) [碎屑锆石年龄](#) [三叠纪俯冲](#) [中国东北](#)

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