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扬子地台西南缘高家村岩体成因: 岩石学、地球化学和年代学证据

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摘要:

高家村岩体辉长岩-橄辉岩中矿物组合、矿物结晶顺序及岩浆成因角闪石的普遍出现,指示矿物结晶于富含水的岩浆体系。主量元素 Al_2O_3 、CaO与MgO呈明显的负相关关系,表明斜长石并非早期堆晶相。稀土元素含量为 $5.97 \times 10^{-6} \sim 221.32 \times 10^{-6}$,轻稀土元素相对富集,中等程度轻重稀土元素分异,辉长岩-含辉石闪长岩无明显的Eu异常,而橄辉岩具有较明显的正Eu异常。微量元素中,辉长岩-含辉石闪长岩类具有明显的Nb、Ta、Zr、Hf和Ti负异常,Ba、Sr正异常,同时 $\epsilon_{Nd}(t)$ 为 $0.59 \sim 1.86$,低于同期的亏损地幔值,与岛弧基性岩浆特征类似。含辉石闪长岩SHRIMP锆石U-Pb年龄结果 $822 \pm 8Ma$,为新元古代。综合分析认为,高家村岩体应形成于受俯冲带流体改造的亏损上地壳部分熔融。

英文摘要:

The mineral assemblage, crystallizing sequence and ubiquitous occurrence of hornblende in the gabbro-peridotite pluton near Gaojiacun Village, Yanbian County, Sichuan Province, all indicate that the rocks formed from the hydrous magma. The obvious negative correlations between the major components Al_2O_3 , CaO and MgO imply that plagioclase is not an early cumulate phase. With the total REE contents from 5.97×10^{-6} to 221.32×10^{-6} , the LREE are moderately enriched and the LREE and HREE are weak to moderately differentiated. While the Eu anomaly is weak in gabbro and pyroxene-bearing diorite, but prominent in olive-gabbro and peridotite. As to the trace elements, negative anomalies of Nb, Ta, Zr, Hf and Ti, but positive anomalies of Ba and Sr can be observed in the gabbro and pyroxene-bearing diorite. Meanwhile the $\epsilon_{Nd}(t)$ gives the range of $0.59 \sim 1.86$, which is lower than that of the contemporaneous depleted mantle, suggesting the similar feature to that of basic magma of the island arc. In addition, the Neoproterozoic age, $822 \pm 8Ma$, is obtained with SHRIMP U-Pb analysis of zircon from the pyroxene bearing diorite. Summarizingly the Gaojiacun pluton was derived from the partial melting of the depleted upper mantle which had experienced alteration by the fluids from the subduction zone.

关键词: [高家村岩体](#) [地球化学](#) [岛弧](#) [新元古代](#)

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