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吉林珲春三叠纪高镁闪长岩的发现及地质意义

作者	单位	E-mail
<a href="#">付长亮</a>	<a href="#">吉林大学地球科学学院, 长春 130061</a>	<a href="mailto:fu_chliang@sina.com">fu_chliang@sina.com</a>
<a href="#">孙德有</a>	<a href="#">吉林大学地球科学学院, 长春 130061</a>	<a href="mailto:sundy@jlu.edu.cn">sundy@jlu.edu.cn</a>
<a href="#">张兴洲</a>	<a href="#">吉林大学地球科学学院, 长春 130061</a>	
<a href="#">魏红艳</a>	<a href="#">吉林大学地球科学学院, 长春 130061</a>	
<a href="#">苟军</a>	<a href="#">吉林大学地球科学学院, 长春 130061</a>	

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摘要:

吉林珲春地区首次发现的高镁闪长岩对于讨论东北地区岩石圈演化历史具有重要意义。该类岩石的锆石LA-ICPMS U-Pb年龄为241~240Ma, SiO<sub>2</sub>和MgO的含量分别介于51.93%~55.85%和3.97%~10.38%之间, 具有较高的Mg<sup>#</sup>(0.45~0.70), 属于钠质钙碱性系列。轻稀土略微富集, 但稀土配分曲线近于平坦型, 富集Rb, 亏损Ba、Nb、Ta、P和Ti等元素。该类岩石的锆石<sup>176</sup>Hf/<sup>177</sup>Hf值和ε<sub>Hf</sub>(t)值分别变化于0.282672~0.283085和1.78~15.95之间, 显示地幔来源的特征, 最小单阶段模式年龄(t<sub>DM1</sub>=246Ma)与其侵入年龄(t=240~241Ma)相一致, 表明该区乃至延边地区在240Ma左右的中三叠世存在一次重要的地壳增生事件。Sr/Y(3.19~12.48)-Y(19.3×10<sup>-6</sup>~81.1×10<sup>-6</sup>)和(La/Yb)<sub>N</sub>(1.00~3.51)-Yb<sub>N</sub>(4.15~14.62)判别图解显示其形成可能与赞岐岩有相似的岩浆过程, 即形成于消减带之上的地幔楔环境, 由地幔橄榄岩与消减洋壳板片部分熔融产生的富Si质熔体平衡反应形成。综合研究表明, 延边地区早三叠世之前为活动陆缘环境, 古亚洲洋板块向华北板块之下俯冲。

英文摘要:

The high-Mg diorites newly discovered in Hunchu area, Jilin Province, is of importance for discussing the evolution history of the lithosphere in NE China. The zircon LA-ICPMS U-Pb ages for this type of rocks range from 241 to 240Ma, and the contents of SiO<sub>2</sub> and MgO are in the range of 51.93%~55.85% and 3.97%~10.38%, respectively. They are high in Mg<sup>#</sup> (0.45~0.70) in the bulk rock composition and belong to sodic calc-alkaline series. They are characterized by nearly flat REE patterns with LREE slightly enriched, and show enrichment of Rb and depletion of Ba, Nb, Ta, P and Ti. The values of <sup>176</sup>Hf/<sup>177</sup>Hf and ε<sub>Hf</sub>(t) vary in the range of 0.282672~0.283085 and 1.78~15.95, respectively, suggesting they are of mantle origin. The minimum single-stage model age (t<sub>DM1</sub>=246Ma) for this suite of rocks is similar to its emplacing age (t=240~241Ma), suggesting there was a major crustal growth event occurred at ~240Ma in Yanbian area. The discrimination diagrams of Sr/Y (3.19~12.48)-Y(19.3×10<sup>-6</sup>~81.1×10<sup>-6</sup>) and (La/Yb)<sub>N</sub> (1.00~3.51)-Yb<sub>N</sub> (4.15~14.62) show that the high-Mg diorites were likely formed in a mantle wedge setting similar to the magmatic processes of sanukitite. They are likely formed from mantle peridotites by reacting with Si-rich melts released from subducted oceanic slab. The comprehensive studies show that the Yanbian area was located in an active continental margin setting and affected by the subduction of Paleo-Asian Ocean plate towards North China plate before Early Triassic.

关键词: [高镁闪长岩](#) [锆石U-Pb年龄](#) [赞岐岩](#) [地壳增生](#) [小西南岔](#)

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主办单位: 中国矿物岩石地球化学学会

单位地址: 北京9825信箱/北京朝阳区北土城西路19号

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