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抚顺南部早前寒武纪变质杂岩的地质事件序列

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摘要：

抚顺南部早前寒武纪变质杂岩是华北克拉通北缘辽北-吉南早前寒武纪变质地块的一个重要组成部分，主要由浑南群石棚子组角闪岩相变质火山岩、火山碎屑岩及相伴生的沉积岩等表壳岩系和侵位于其中的石英闪长质片麻岩、英云闪长质-奥长花岗质-花岗闪长质（TTG）片麻岩和花岗闪长岩-二长花岗岩-钾长花岗岩岩石组合组成。LA-ICP-MS锆石U-Pb同位素分析结果显示，侵位于表壳岩中的石英闪长质片麻岩样品12LN39-3的岩浆结晶年龄为2571±7Ma，指示存在老于该年龄的表壳岩系。英云闪长质片麻岩样品12LN04-1和奥长花岗质片麻岩样品13LB49-3的岩浆结晶年龄分别为2544±4Ma和2550±10Ma，记录了一期重要的英云闪长质-奥长花岗质片麻岩侵位事件。斜长角闪岩（样品12LN25-2）的岩浆结晶的最小年龄为2530±5Ma，指示另一火山喷发阶段。晚期钾长花岗岩样品12LN01-1和奥长花岗质片麻岩样品12LN27-1分别侵位于2522±4Ma和2518±23Ma，说明它们的岩浆作用发生于同一时期。而采自于晚期未变形侵入体的石英闪长岩样品12LN30-2的岩浆结晶年龄为2496±18Ma，与上述表壳岩和深成侵入体的主要变质作用（2510~2470Ma）同期发生。这些年代学结果表明，抚顺南部地区新太古代大规模的铁镁质火山喷发作用在大于2571±7Ma已经发生，紧接着2571±7Ma发生石英闪长质岩浆侵位，在2550±10Ma~2544±4Ma之间发生英云闪长质-奥长花岗质岩浆侵位。接下来铁镁质火山再度喷发（~2530±5Ma），随后为钾长花岗岩和奥长花岗质岩浆的侵位（2522±4Ma~2518±23Ma）。晚期为角闪岩相变质作用时期（2510~2470Ma），伴随一定规模的石英闪长岩侵位。

英文摘要：

Early Precambrian metamorphic complex in South Fushun area, Liaoning Province, is an important part of the Early Precambrian North Liaoning-South Jilin metamorphic block, in the northern margin of the North China Craton, and consists mainly of amphibolite facies metamorphic supracrustal rocks and paleoplutonic rocks. The supracrustal rocks are attributed to the Shipengzi Formation of Hunnan Group, and are composed of metamorphic volcanic rocks, volcaniclastic rocks, and related sedimentary rock sequences, which were intruded by the paleo-plutonic quartz dioritic gneiss, tonalitic-trondhjemitic-granodioritic (TTG) gneisses, and granodiorite-monzogranite-syenitic granite assemblage. LA-ICP-MS zircon U-Pb isotopic analyses reveal that the precursor of quartz dioritic gneiss (sample 12LN39-3) was emplaced into the supracrustal rocks at 2571±7Ma, and therefore, the supracrustal volcanic rocks erupted before the 2571±7Ma. The precursors of tonalitic gneiss (sample 12LN04-1) and trondhjemitic gneiss (sample 13LB49-3) were emplaced at 2544±4Ma and 2550±10Ma, respectively, revealing an important tonalitic-trondhjemitic magmatism event. The plagioclase amphibolite (sample 12LN25-2) has minimum magmatic crystallization age of 2530±5Ma, indicative of another large-scale volcanic eruption event. The precursors of syenitic granite (sample 12LN01-1) and trondhjemitic gneiss (sample 12LN27-1) display similar magmatic crystallization age of 2522±4Ma and 2518±23Ma, respectively, suggesting they were emplaced contemporaneously. The precursor of quartz diorite (sample 12LN30-2) that was collected from a weak deformation stock was emplaced at 2496±18Ma, which is corresponded to the main metamorphic time of these supracrustal rocks and plutonic rocks (2510~2470Ma). These zircon U-Pb isotopic dating results reveal that a large-scale volcanic eruption of mafic magma occurred before 2571±7Ma, which was followed by the emplacement of quartz dioritic gneisses at 2571±7Ma and tonalitic-trondhjemitic gneisses in 2550±10Ma~2544±4Ma in South Fushun area. After that, mafic volcanic magma erupted again (~2530±5Ma), followed by the emplacement of syenitic granites and trondhjemitic gneisses (2522±4Ma~2518±23Ma). Amphibolite facies metamorphism and synchronous quartz dioritic magmatism occurred in 2510~2470Ma.

关键词：锆石U-Pb年代学 地质事件序列 早前寒武纪变质杂岩 辽宁抚顺南部地区

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