



Geochemistry and $^{40}\text{Ar}/^{39}\text{Ar}$ geochronology of the ophiolite in Northern Xinjiang

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As the remnant of ancient oceanic crust, ophiolite is extremely important to reconstruct the framework of ancient ocean and continent. There are several ophiolite belts in Northern Xinjiang, assuming planar distribution, and they are generally related to different faults since Paleozoic in the outcrops. This paper presents a systematic study of geochemistry and geochronology of the gabbro, diabase and basalt of ophiolite collected from different regions in Northern Xinjiang.

The intermediate and basic rocks in ophiolite show similar patterns in primitive mantle-normalized REE and trace elements diagrams with MORB and different from IAT, indicating that the ophiolite may be formed in mid-ocean ridge. Their Sr, Nd and Pb isotopic compositions also show that they have mid-ocean ridge environment affinity. Additionally, their Sr, Nd and Pb isotopic ratios are similar respectively, suggesting the same source area, and they also have positive epsilon Nd values (4.40 ~ 8.04), which indicates they likely originate from the depleted mantle. The previous and the author's researches show that the forming time of ophiolite in Northern Xinjiang is early Paleozoic, but $^{40}\text{Ar}/^{39}\text{Ar}$ ages of gabbro, diabase and basalt are in the range of 396 ~ 226Ma (mainly from 350 to 250Ma), and no ages of early Paleozoic are gained. Moreover, this time coincides with the timing of late Paleozoic post-collisional plutonism, indicating the ophiolite in Northern Xinjiang was reworked by the late thermal events. The ophiolite widely exposed in Northern Xinjiang have similar characteristics of occurrence, lithologic association and isotopes in spite of diverse special features, which indicates that a relatively uniform and integrated source region has existed in Northern Xinjiang since Paleozoic. It is likely to infer that this source region is related with the long lasting remnant oceanic basin and the related lithosphere since Paleozoic in North Xinjiang.

Key Words: Ophiolite, $^{40}\text{Ar}/^{39}\text{Ar}$ age, Geochemistry, Remnant oceanic basin, Northern Xinjiang