

## Paleo-Asian Oceanic slab under the North China Craton revealed by high pressure minerals in alkaline rocks from subducted crust

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Lithospheric mantle under the North China Craton (NCC) is thought to have undergone comprehensive refertilization due to the input from subducted slabs. However, the existence of the Paleo-Asian oceanic slab under the NCC remains controversial, and thus the possible contribution from the slab to the north is poorly constrained. The Triassic alkaline rocks with ages of 215-235 Ma are widely distributed in the northern NCC, which are thought to have formed by low-degree partial melting of metasomatized mantle.

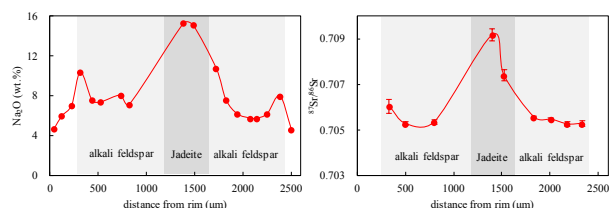


Fig. 1 Variations of Na<sub>2</sub>O and Sr isotopic compositions of one special phenocryst

High pressure minerals such as garnet, rutile and jadeite exist as inclusions in the titanites from alkaline rocks, which may be residual minerals in recycling eclogite from the subducted slab. A special phenocryst is found in the alkaline rocks, which contains the jadeite core and the alkali feldspar mantle and rim. In-situ Sr isotopic analyses of this phenocryst show that the jadeite core has higher radiogenic Sr (up to 0.7092) than the alkali feldspar mantle (low to 0.7052), while Rb/Sr ratio of the rim is too high to get accurate Sr isotopic data. These variations indicate that the jadeite core may be derived from recycling crustal material at high pressure and alkali feldspar mantle formed from magma via partial melting of metasomatized mantle. Furthermore, calcite in the alkaline rock is igneous due to the similar REE contents with host rocks, which implies the magma is enriched in CO<sub>2</sub> and associated to the carbonate metasomatism.

In conclusion, mineralogical and geochemical features of alkaline rocks provide direct evidence for the presence of the Paleo-Asian oceanic slab beneath the NCC and may exist as recycling eclogite.