

**PROTOLITHS OF ECLOGITES FROM NORTHERN QIDAM BASIN, CHINA:
IMPLICATIONS ON TECTONIC EVOLUTIONS**

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The occurrence of high-pressure eclogites in the northern border of Qaidam basin in central China indicates the existence of a 350 km orogenic belt. The protoliths of these eclogites provide constraints for reconstructing the tectonic evolution history in this region. In this study, we analyzed thirty-seven eclogites sampled from the eastern, central and western parts of this orogenic belt for their major and trace element abundances as well as Nd isotopic ratios to investigate the nature of their protoliths.

In the AFM plot, the variation trend of these eclogites resembles that of tholeiites. Based on the U-Pb dating on zircons, the metamorphic age of these eclogites is inferred to be ~ 450 Ma. After age corrections, the $\epsilon\text{Nd}_{(450)}$ values of the studied eclogites can be divided into two groups; greater than 9 for Group I and 2.9 ~ 4.3 for Group II. Group I samples occur at all sampling localities but are most abundant at the eastern portion of the studied orogenic belt. They have high HREE/LREE ratios resembling that of normal mid-ocean ridge basalts (N-MORB). However, their $\epsilon\text{Nd}_{(450)}$ values (9 ~ 15) are higher than that of N-MORB (7 ~ 9) possibly reflecting post-metamorphic metasomatism which decreased their Sm/Nd ratios. In contrast, Group II samples have HREE/LREE ratios lower than that of N-MORB, and can be further divided into two subgroups; IIa and IIb, characterized by the absence and presence of HFSE depletions, respectively. The geochemical characteristics of the former are similar to those of the enriched MORB (E-MORB) whereas those of the latter are of typical arc lavas. The IIa samples mainly collected from the central part while the IIb samples were only discovered at the eastern edge of northern Qaidam Basin.

The occurrence of arc-related protoliths only at the eastern edge of northern Qaidam eclogites possibly indicates two subduction events. These arc protoliths might result from the collision between the paleo-Qilian ocean on the north of Qaidam block and eastern Yangtz block. The subsequent subduction of the paleo-Qilian ocean and the associated eastern arcs completely consumed this ocean-arc system leading to the formation of north Qaidam eclogites. Alternatively, the relative proportions of oceanic and arc protoliths might reflect the size of the consumed ocean with high proportions of arc-related protoliths indicating subduction of a small size ocean. In such case, the opening of paleo-Qilian might propagate from west to east. Distinguishing these two models requires analyzing more eclogites and amphibolites from this region.