

ORIGIN OF CENOZOIC BASALTIC LAVAS IN THE ERDAOBAIHE RIVER VALLY, CHANGBAISHAN, CHINA

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The Tianchi volcano in the Changbaishan on the border between China and North Korea is composed of the Pliocene to early Pleistocene basaltic shield, middle to late Pleistocene trachytic composite cone. It is an active volcano because of several eruptions in the Holocene.

In this study, we surveyed basaltic lava sections in the Erdaobaihe river valley and analyzed chemical composition of the lavas. They consist of basalt in upper level and trachybasalt and basaltic trachyandesite in middle to lower levels. The lavas are similar in REE patterns, suggesting that they likely share the same source. In the diagram of Na₂O-K₂O and La-La/Yb, basalts are shown as Na-rich and tholeiite series, whereas, trachybasalt and basaltic trachyandesite are K-rich and alkali-series. Their Mg[#](=100Mg²⁺/(Mg²⁺+Fe²⁺))<60) are lower than that (=60-68) of Cenozoic primary basalt magmas in the eastern China. Their K/Rb ratios (0.05-23.15) and Ni contents (27.76-200.61) are less than primary mantle, whereas Ba/Rb ratios(15.64-264) are greater than primary mantle. All lines of evidence indicate that these lavas originate from evolved magma. The SI values for basalt and trachybasalt are less than 40, and SI values for basaltic trachyandesite are in the range of 20–29. The lavas contain phenocryst of olivine, pyroxene and plagioclase. There are positive anomaly of Ba in trace element pattern and negative anomaly of Eu in REE pattern. These geochemical features reveal that tholeiite formed from mantle derived magma which underwent crystal fractionation. Higher K₂O (>2.0%) of trachybasalt and basaltic trachyandesite indicate that variable degrees of contamination may occur during magmas ascending. The discrimination diagrams of Zr-Nb-Y and Zr/Y-Zr show that the lavas formed in inner plate setting.

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