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Geochemistry of the High-Ti Flood Basalts in Mid-Eastern Emeishan Large Igneous Province, SW China

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The Late Permian Emeishan Large Igneous Province (ELIP) is commonly regarded as being located in the western part of the Yangtze craton, SW china. The continental flood basalts (CFB) are widely distributed in this region, characterized by a great deal of volumes and high eruption rates.

The Flood basalts in mid-eastern ELIP (such as Miyi, Ertan, Zhaojue, Dongchuan, etc.) are composed of high-Ti basalts and low-Ti basalts based on the content of TiO_2 [1]. The high-Ti basalts can be subdivided into Group I and Group II. Group I displays strikingly negative Sr and Zr anomalies, which is different from Group II.

Geochemical characteristics such as concentrations of the trace elements (Rb, K, Ba, Th, Nb, Ta), trace element ratios (Ba/Nb, Ba/Th, Zr/Nb, Th/La, Zr/Hf) and Sr - Nd - Pb isotopes for Group I and Group II are also distinct. Group I have higher Ba, Rb, Nb contents and lower Zr/Hf ratio. $^{87}Sr/^{86}Sr$ ratios of Group I and Group II vary from 0.7060 to 0.7074, and 0.7049 to 0.7069, εNd(t) values range from -2.06 to -2.70, and 0.66 to 2.92, respectively. In the $^{208}Pb^*/^{206}Pb^*$-$^{87}Sr/^{86}Sr$,$^{208}Pb^*/^{206}Pb^*$ - $^{143}Nd/^{144}Nd$ diagrams, the two group show different characteristics, Group I show the similar features of EM II, Group II have the mixed features of EM I and common component [2].

These differences between Group I and Group II are probably not resulted from the magma evolution process (fractional crystallization, crustal contamination, assimilation-fractional crystallization, and partial melting), but from the distinct mantle sources. Group I, with the feature of EM II, is probably generated by partial melting of metasomatic mantle enriched pyroxenite. Group II, with the mixed features of EM I and "C" component, is probably derived from partial melting of mantle-derived materials with wide metasomatie spectrum.

The result indicates that sources of high-Ti basalts in mid-eastern ELIP are heterogeneous, when plume rose and carried different materials at different mantle depth, these materials underwent distinct degrees of partial melting, which resulted in the differences between Group I and Group II.

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