

Sr-Nd-Li isotopes constraining Pliocene continental weathering in East Asian Continental Margin

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Continental weathering, especially silicate weathering, is a net consumption of atmospheric CO₂, which is important for understanding of global carbon cycle and climate change. During the late Cenozoic a series of basalts were formed in East Asian continental margin (China continent and surrounding islands such as Hainan) as the result of tectonic movement. Weathering of the basaltic crust subject to the East Asian monsoon climate plays a vital role in the sedimentation and biogeochemical processes in the west Pacific.

Two well preserved boreholes with Pliocene basaltic rock weathering cycles were taken from the Yangtze Delta. Sequential large scale magmatic (volcanic) activities occurred in the Pliocene epoch along the East Asian continental margin. Such event is preserved in these two boreholes, showing eight successive basaltic weathering cycles (top part eroded) altogether. With only distinctive weathering information attached, these samples are excellent materials to study the Pliocene weathering pattern. Previous studies has shown that the typical weathering index like CIA has its drawbacks in explaining chemical weathering. The bulk Sr-Nd isotopic compositions could provide good weathering and source constraints on the evolution of weathered upper continental crust. As a relatively novel stable isotope, $\delta^7\text{Li}$ has been successfully applied in the rock weathering and juvenile (basaltic) crust. Li isotope has the potential to record rapid climate change and the subsequent chemical weathering. Therefore, in this work we try to recover the Pliocene weathering history in East Asian Continental Margin with multitracers Sr-Nd-Li, and finally to reveal the potential contribution of source transport to the marginal ocean.

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