Silicon Isotope Compositions of Dissolved Silicon and Suspended Matter in the Yellow River,China

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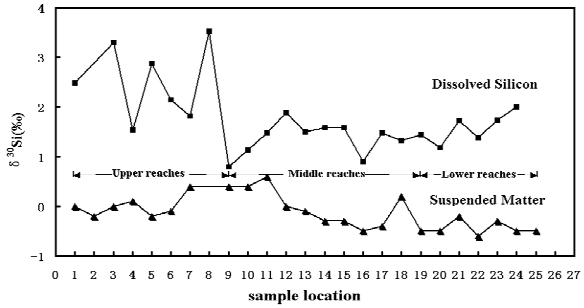
Up to now, there are a few studies on silicon isotope in hydrosphere, including study on the Yangtze River (T. Ding et al., 2004), oceanic water and several water samples from rivers (De La Rocha et al., 2000). In this study the silicon isotope composition of dissolved silicon and suspended matter in the Yellow River was studied. Twenty five samples were collected from mainstream and four tributaries of the Yellow River in August 2004. The SiF_4 method was used for silicon isotope measurement, and the analytical precision was better than ± 0.1‰(2σ).

The concentrations of the suspended matter in Yellow River range from 0.11 to 42.6 g/l. The SiO_2 contents of suspended matter range from 44.6% to 71.7% and their $\delta^{30}Si$ values of suspended matter vary from -0.6 to 0.6‰. The silicon contents of dissolved silicon in the water range from 7.45 to 17.3 mg/l and their $\delta^{30}Si$ values of dissolved silicon vary from 0.8 to 3.5‰, averaging 1.7‰.

From the upper reaches to the lower reaches, the $\delta^{30}Si$ values of suspended matter trend to decrease, which may reflect the increase trend of clay/(Q+Fs) in suspended matter. In the upper reaches, the $\delta^{30}Si$ values of dissolved silicon show large fluctuation, reflecting the effect of silicon absorption by plants in large area wetlands and crop fields. However, it shows a decreasing trend in general. In contrast, the $\delta^{30}Si$ values increase slightly from the middle reaches to the lower reaches(see Figure), similar to the trend observed in the Yangtze River, but with smaller variation range, reflecting less influence of silicon absorption of plants from crop fields.

The $\delta^{30}Si$ value of dissolved silicon in water output from the Yellow River to Bohai Sea is 2 ‰ in August 2004.



References

[1] De La Rocha C. L.,Brzezinski M. A., DeNiro M. J., and Shemesh A. (2000) *GCA* **64,** 2467-2477.

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