

## Mg Isotope Geochemical Study of the Huanghe River

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Characterizing the Mg and its isotopes behavior in river systems could provide new insight into the geochemical processes and environmental conditions, due to its key role in matter cycling between rock and water and plant. Dissolved Mg in the Huanghe River shows a wide range of  $\delta^{26}\text{Mg}$  values, ranging from -1.53‰ to -0.11‰, with most values being close to -1.09‰. By comparison, most of the suspended loads are enriched in heavy Mg isotope, with  $\delta^{26}\text{Mg}$  values ranging from -2.00‰ to -0.62‰, which is controlled by mineralogy. The Mg isotopic composition in the upstream is mainly determined by the mixture between carbonate and silicate sources. When the Huanghe flows through the Loess Plateau, the dissolved Mg decreased due to the dissolution of easily dissolvable phases in loess. Carbonates weathering and evaporites dissolution are the major controlling factor of the evolution of Mg isotopic composition in dissolved phase. In addition, evaporation-related precipitation of secondary carbonates also influences the dissolved Mg isotope composition in some tributaries. The strong relationships between  $\delta^{26}\text{Mg}$  and pH, temperature, and  $\delta^{18}\text{O}$  suggest that the Mg isotope system bears significant information about the hydrogeochemical characteristics and climate conditions of the Huanghe basin.

This work was jointly supported by the National Natural Science Foundation of China (Grant No. 401173030, 41210004) and the National Basic Research Program (973) of China (Grant No.2013CB956401).