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The chemical and isotopic characteristics of dissolved sulfate in rivers of Songliao basin, NE China

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Songhuajiang river and Liao river are the two longest rivers and most intensely exploited inland rivers in Songliao basin. In recent years, with the irrational nature of human activities and other factors, water pollution timely becomes a serious problem. In order to understand geochemical characteristics of dissolved sulfates and the influence of hydrological processes on SO_4^{2-} sources in diverse aquatic system of northeastern China, chemical and isotopic compositions of river water samples from mainstream and most tributaries were carried out in Songliao basin.

The variations of chemical and isotopic composition along the river show that lower reach waters were more contaminated as compared to upper reach waters of the river for the mainstream of each river. The seasonal change of concentration and sulfur isotopic composition of SO_4^{2-} was not observed. The data distribution of all samples for each river can be explained in terms of three-end member mixing for SO_4^{2-} sources. The three main sources include precipitation, the sulfate in soil, and anthropogenic source, including sewage water inputs and/or the effects of sulfate reduction under anoxic condition, which indicate that the sulfur cycling is obviously influenced by anthropogenic source.

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