

Hydrochemical and Stable Isotope characteristics of surface water and groundwater in Xiliugou and Wulagai River basin, North China

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Abstract

Studies on water origin and transformation relationship between groundwater and surface water is important for understanding on hydrological processes and water resources management. In this study surface water and groundwater samples from Xiliugou and Wulagai River basin were collected and analyzed for stable hydrogen and oxygen isotopes and hydrochemistry data. The results show that the pH of all water samples ranged from 6.81 to 8.91, belongs to weak alkaline water; the average value of TDS in surface water and groundwater is less than 1000mg/l, which is low mineralization water. $\text{Na}^*\text{Ca}-\text{SO}_4^*\text{HCO}_3$ type and $\text{Ca}^*\text{Na}-\text{HCO}_3$ type was the dominant hydrochemical types for surface water in Xiliugou and Wulagai River basin, respectively; $\text{Na}^*\text{Ca}-\text{HCO}_3$ type and $\text{Ca}^*\text{Mg}-\text{HCO}_3$ type for groundwater in Xiliugou and Wulagai River basin respectively. The End-Members Mixing Analysis (EMMA) used for hydrograph separation indicated that in the growing season, the groundwater was recharged by precipitation (76.87 %), and surface water (23.13 %) in Xiliugou; the groundwater in Wulagai was mainly recharged by precipitation (65%) and surface water (35 %).

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