

Groundwater flow system and the water quality in Yiluo River Basin, China

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The study area is the Yiluo River basin in China. In this paper, the authors discuss mainly on the results of the field survey carried out from August 10 to September 20 in 2006, from February 25 to March 20 in 2007 and from August 20 to September 20 in 2007. The authors made the measurements of pH, electric conductivity and water temperature in situ, and analyses of the water samples in the laboratory. The number of sampling points of groundwater is 82, and that of river 16, and that of reservoir 3, and the total number of the sampling points is 101.

The results of this study are as follows;

(1) In generally speaking, groundwater flows toward the lowland area of the basin, i.e., the central part of the basin, but there is no spring and self-flowing well in the lowland area. However, there are some artesian aquifers in the basin, and it is necessary to distinguish them and treat as different groundwater.

(2) Electric conductivity of shallow groundwater is very high in the lowland area in the basin.

(3) The water quality of groundwater in Yiluo River basin is mainly Ca-HCO_3^- type, However, there are some indications that the water qualities changes caused by some interaction to the aquifer and human activities in the city area.

(4) There is Seasonal changes in the concentrations of dissolved substances of shallow groundwater in Yiluo River basin.

(5) The stable isotope ratio of the groundwater samples at the peripheral part of the basin is rather high value, i.e. ; heavy water, and in the central part of the basin, the value is low, light water. In the eastern part of the basin, down-stream part, precipitation at the high mountain area, to the southeast of the basin, with low δD and low $\delta^{18}O$ may be flowing to the bottom of the basin.

(6) Tritium ratios of the groundwater along the Yiluo River at the bottom of the basin are very low, therefore, the residence time is long. Tritium ratio of the groundwater of the slope of the southern mountain range is higher than those of the bottom of the basin.